Book of Abstracts.

It's time.

MEDICINES MANAGEMENT 2018
The 44th SHPA National Conference
BCEC, Brisbane | 22-25 November

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TIME TO INVEST

**Professor Christopher Cutts**

*Pharmacy Dean, School of Pharmacy and Medicines Optimisation, Health Education England, UK*

‘Pharmacy has changed, is changing and will change’. How many times have we heard or said this? But now this change is happening at an unprecedented scale and pace in a range of new care settings. Pharmacists are now prescribing, performing clinical examinations, deciding if patients should be admitted, an integral part of triage processes, managing caseloads, discharging patients and leading multiprofessional teams. Pharmacy technicians are leading dispensaries and services, administering medicines, performing clinical observations and undertaking domiciliary reviews, medicines reconciliation and discharge processes. So, it is time for us to ask the question ‘Is our education model sustainable and safe to deliver this clinical pharmacy activity at a population level?’

Published evidence and current workforce experiences informs us that the current education model doesn’t produce the right people, with the right skills for the right places in the right numbers. The model must also adapt for the increasing patient facing roles in new care settings including social care, inevitable use of automation, widening role of digital technology, the need for digital literate professionals and wider use of data. This presentation will look at emerging models of education in the UK. Chris will describe some of the current workforce initiatives in the UK and the new role of a Pharmacy Dean. He will also reflect on his time in Australia in the early 2000s and how this has influenced his thinking and practice.

It’s being described as a ‘golden age’ for pharmacy, so healthcare education leadership needs to respond, ‘It’s time to INVEST’.
MEDICATION HISTORIES FROM THE CLOUD: USEFUL, BUT BEWARE OF THE PITFALLS

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Background

Obtaining an accurate medication history on admission to hospital is challenging. Electronic Prescription Exchange Services (PES) capture community prescribing and dispensing data. This data can be accessed, with patient consent, via software called MedView (Fred IT Group). In future it will also be accessible from ‘My Health Record’. The accuracy of PES medication history data is unknown.

Aim

To evaluate the accuracy of the MedView cloud-based repository of PES prescribing and dispensing data.

Methods

A convenience sample of 154 patients (median age 76 years) was recruited at two large Victorian health services. Best possible medication histories (BPMH) were obtained by hospital pharmacists using multiple sources, excluding MedView (median 3 sources, range 2–6). Consent was obtained from patients to compare their MedView medication records to the pharmacist-obtained BPMH.

Results

According to pharmacists’ BPMHs, the patients used 1648 medications prior to admission; 550 (33.4%) of these were not recorded in MedView. For 276 (16.7%) medications, the dose regimen in MedView differed from what the patient actually used. There were 224 medications recorded in MedView that patients were not currently using. Medications commonly involved in discrepancies were: paracetamol (n=380), inhaled respiratory medicines (n=76), colecalciferol (n=58), opioids (n=51) and aspirin (n=41). Reviewing patients’ MedView records detected 50 BPMH errors, mostly omissions.

Conclusion

Cloud-based PES data repositories provide an additional information source that may assist health professionals with collating a BPMH. However, it is important to be aware of their limitations. Confirmation of medication histories with patients and/or other sources remains crucial.

COLLABORATION BETWEEN HEALTHCARE AND INDUSTRY TO IMPROVE THE SAFETY OF NEUROMUSCULAR BLOCKING AGENTS IN AUSTRALIA

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Background

Neuromuscular Blocking Agents (NMBAs) are high-risk medications administered in critical-care settings. The unintentional administration of a N MBA can result in permanent injury or death. Current Australian N MBA labelling and packaging does not clearly differentiate NMBAs from other medications.

Aim

To describe the collaboration initiated by pharmacists and anaesthetists between manufacturers, the Therapeutic Goods Administration (TGA) and peak Australian healthcare organisations to improve N MBA safety in Australia.

Methods

In February 2015, the Victorian Therapeutics Advisory group (VicTAG) submitted: ‘Time for change: proposed safety improvements to N MBA labelling and packaging in Australia’ to the TGA. The submission identified look-alike labelling and packaging as a contributor to Victorian N MBA incidents resulting in life-threatening patient harm. Eleven of 13 Australian N MBA products had no distinctive labelling and packaging. The initial TGA evaluation did not support changing N MBA labelling and packaging.

A response was coordinated from Victorian and NSW TAGs, published authors, the Australian and New Zealand College of Anaesthetists and the Australian Commission on Quality and Safety in Healthcare.

Results

In November 2017, the TGA initiated a roundtable discussion inviting N MBA manufacturers, pharmacists, anaesthetists and peak Australian healthcare organisations. The importance of distinctive labelling and packaging to decrease selection errors was emphasised. In July 2018, the TGA issued the regulation that standardising N MBA labelling and packaging with a colour-coded warning label will become mandatory from 2020.

Conclusion

Hospital pharmacists and anaesthetists led a strategy resulting in a unique collaboration between the TGA, industry, and peak healthcare organisations, to improve N MBA safety in Australia.

TREATMENT OF CLOZAPINE-ASSOCIATED OBESITY AND DIABETES WITH EXENATIDE (CODEX): A PILOT RANDOMISED CONTROLLED TRIAL

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Aim

To determine whether the Glucagon-like peptide-1 (GLP-1) receptor agonist exenatide can reduce weight gain associated with clozapine.

Methods

This randomized, controlled, open-label, pilot trial evaluated weekly exenatide for weight loss among clozapine-treated obese adults with schizophrenia, with or without T2DM. A total of 28 outpatients were randomized to once-weekly extended-release subcutaneous exenatide or usual care for 24 weeks. The primary outcome was
EMERGENCY DEPARTMENT SCREENING TOOLS TO ASSIST PHARMACISTS TARGETING PATIENTS AT RISK FOR MEDICATION RELATED PROBLEMS

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Aim Having pharmacists practicing in the emergency department (ED) is well recognised, but their major challenge is to identify which patients to target. This study developed screening tools (one for use at ED presentation and one at ED discharge) to identify patients at greatest risk for medication-related problems (MRPs).

Methods We undertook a prospective, observational, multi-centre study. Blocks of ten consecutive adult ED patients presenting at pre-specified times were identified. Within one week of ED discharge, a pharmacist interviewed the patient and undertook a medical record review to determine a medication history, patient understanding of treatment, risk factors for MRPs and to manage any MRPs. Univariate analysis and logistic regression were undertaken. Odds ratios for independent predictors were used to weight variables in the screening tools.

Results Overall 904 patients were recruited (9 EDs, 3 states). Characteristics predicting MRPs that could be managed at presentation were: medication-related presentation to ED (OR 12.94), taking > 8 regular medications (OR 11.54), age ≥ 80 years (OR 2.89), sometimes/often missing medication doses (OR 2.29), seeing a specialist in past 6 months (1.98), concession/pension cardholder (OR 1.73), self-reported medication allergies/sensitivities (OR 1.70). Characteristics associated with MRPs after discharge were whether a medication requiring complex education was prescribed on discharge (e.g. warfarin, Epipen or inhaler device) (OR 5.75), reporting sometimes/often missing medication doses (OR 5.26), male gender (OR 1.76).

Conclusion Predictors of MRPs associated with ED care that are readily determined at the bedside have been identified. The screening tools are currently undergoing national validation.

PARTNERED PHARMACIST MEDICATION CHARTING: MULTI-SITE EVALUATION DEMONSTRATING REDUCTION IN LENGTH OF STAY

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Aim To undertake a multi-centre evaluation of translation of a partnered pharmacist medication charting (PPMC) model in patients admitted to general medicine units (GMUs) in public hospitals in Victoria, Australia.

Methods Design – Unblinded, prospective cohort study comparing patients admitted before and after PPMC implementation.

Participants – All adult patients admitted to GMUs of seven public hospitals in Victoria from 20 June to 24 September 2016.

Intervention – Admission medication charting by pharmacists using a partnered model compared to traditional charting by doctors.

Outcome measures – The primary outcome was hospital length of stay (LOS). Secondary outcomes included medication errors on inpatient medication charts identified by independent pharmacist assessors within 24-hours of admission.

Results A total of 8,648 patients were included in the study (pre-intervention=5612; post-intervention=3036). The total number of medications charted was 53,371 in the pre-intervention cohort and 31,658 in the post-intervention cohort. Patients whose medications were charted using the PPMC model had a statistically significant reduced median length of inpatient hospital stay from 4.7 (IQR 2.8-8.2) days to 4.2 (IQR 2.3-7.5) days (p<0.001). PPMC was associated with a reduction in the proportion of patients with at least one medication error from 66% to 3.6%, with a number-needed-to-treat (NNT) to prevent one error of 3.3 (95% CI: 3.1-3.5).
**Conclusion** The introduction of a partnered pharmacist charting model was associated with reduced hospital length of stay, number of medications errors and potential harm reduction across seven Victorian public hospitals. It is recommended that PPMC is adopted across health services.

**Methods** A clinical pharmacist-driven medication education intervention was implemented as a randomised-controlled trial in a multidisciplinary hepatology clinic. Patients' knowledge of self-management tasks (8 questions), perceptions of illness (Brief Illness Perception Questionnaire), and quality of life (Chronic Liver Disease Questionnaire) were assessed at recruitment and follow-up (6 months). Patients were followed for 12 months or until death. Clinical data were obtained via patient history and medical records. Comparisons between groups and paired change over time were examined using the Mann-Whitney U and Wilcoxon signed rank tests respectively. Backward conditional regression identified factors associated with hospitalisation.

**Results** 116 patients were randomised (aged 58.8 ±10.2) years, 62.5% male and median Child-Pugh score=8.0). 59 received usual care and 57 received the intervention. There were no significant differences in demographics or clinical status between groups.

At follow-up, 42 usual care and 39 intervention patients completed the survey. Compared to usual care, intervention participants had better knowledge of self-management (p=0.009) and higher perceived understanding of liver disease (p=0.004). Intervention patients also had significantly improved quality of life from baseline (p=0.031); usual care patients did not. Intervention patients were less likely to have ≥1 all-cause unplanned admission during the follow-up period (adjusted odds ratio=0.30, 95%CI 0.12–0.76, adjusted for variceal bleeding and Child-Pugh score).

**Conclusion** Pharmacist-led patient education improved patient outcomes. Extension of pharmacy services to multidisciplinary hepatology clinics should be considered.

**INTENSIVE CARE UNIT MEDICATION MANAGEMENT TECHNICIANS (ICU-MMT) – PHARMACY TECHNICIANS LEADING THE WAY IN MEDICATION ACCESS**

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**Aim** To describe the ICU-MMT role: ICU-based Pharmacy Technicians coordinating the preparation of infusion medications to facilitate timely medication availability, reduce medication errors and expenditure due to wastage.

**Methods** In consultation with senior ICU staff, a pharmacy working group performed ward usage audits, financial analyses, and stability and sterility assessments using Product Information, extended manufacturer's data, or assessment by an external compounding facility. The new service development was presented to ICU Senior Nursing Leadership and medication safety concerns were addressed, and aseptically-validated technicians selected for the role.

**Results** Staged implementation began in July 2018 with four medications (caspofungin, hydrocortisone, erythromycin, vancomycin) prepared by an ICU-MMT rostered to ICU. Appropriate patients are identified by the ICU-MMT through ward-rounds, medications are prepared at a central ICU location, with the patient’s nurse providing the second medication check. Medications are prepared according to Australian Injectable Handbook, aseptic non-touch techniques, and in-house guidelines. Currently between 10–20 infusions are prepared daily. Stage two introduced a second ICU-MMT batching noradrenaline in the Pharmacy Aseptic Suite to centralise preparation of a high-risk medication and reduce wastage; with >$100K expected annual saving of ICU medication expenditure.

**Conclusion** Aseptically-trained ICU pharmacy technicians cost-effectively deliver infusions at the bedside in a timely manner. Batching medications within ICU and pharmacy has reduced medication wastage. This new role highlights further opportunities for technician role expansion, particularly in coordinating medication preparation within critical services.

**CLINICAL PHARMACIST IMPACT ON OUTPATIENT DIALYSIS SERVICES**

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**Aim** A health network in Victoria provides comprehensive care for outpatient dialysis patients across three sites, however only one site provides clinical pharmacy services. This study investigated clinical and financial impacts of clinical pharmacy services in dialysis units (intervention site) compared with control sites receiving no services.
Methods A retrospective cohort study between June and November 2016 was undertaken. Clinical and financial outcomes for dialysis patients at the intervention site were compared with control sites. Clinical measures included within-range haemoglobin and phosphate levels, which are key performance indicators used by the network’s Dialysis Service, and are National dialysis standards. Mean renal readmission rate per dialysis patient and mean readmission costs per dialysis patient per year were calculated and compared for intervention and control sites.

Results Haemoglobin and phosphate levels were maintained within range for 76% (Hb) and 70% (Ph) of patients at the intervention site compared with 58% (Hb) and 53% (Ph) at control sites. Mean readmission rate per dialysis patient at the intervention site was 0.57 (95% CI 0.30–0.88) compared with 0.71 (95% CI 0.2–1.22) at control sites. This equated to a cost saving of $1400 per dialysis patient per annum at the intervention site.

Conclusion Clinical pharmacy services correlated with improved clinical and financial outcomes at the intervention site, which supports the implementation of these services across all sites within the network.
INVITED SPEAKER SESSIONS

S1 Workforce & Wellbeing

1145–1315 | Great Hall 1/2

PHARMACY AT UNIVERSITY: TIME TO LEARN

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Transitioning from being pharmacy students to hospital pharmacists is challenging. Students need to reconcile their professional aspirations and what they have learnt with the realities of practice. A smooth transition can be hampered when they are unable to enact the role or if their expectations are not met. These experiences relate to professional identity, yet, a key challenge for hospital pharmacy and pharmacy educators is how to best support the professional identity formation of graduates as they transition into hospital settings.

This session will: 1) explore pharmacy students’ experiences of the pharmacy curriculum; 2) relates these experiences to professional identity formation; 3) provide practical examples of the challenges and facilitators experienced by graduate to transitioning to practice; 4) generate rich discussions and strategies, with expert panel members, on how to best support graduates’ transition to practice.

FEEDBACK: IT’S TIME TO GO

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Overview Effective feedback can improve performance of pharmacists, yet they are often dissatisfied with feedback processes. This workshop will: 1) explore pharmacists’ feedback experiences, 2) introduce attendees to an evidence-based feedback development program, 3) describe practical strategies for developing feedback capabilities, 4) provide tools for translating the key principals into attendees’ workplaces.

Details Over the past four years, health profession educators at Gold Coast Health have designed, implemented and evaluated an interactive learning program to engage and develop both junior and senior pharmacists’ feedback capabilities when working with junior doctors. This program used a multifaceted approach to support pharmacists’ engagement with feedback processes. These included: e-learning modules; face-to-face workshop and reflective activities. Participants in this MM2018 workshop will explore their own feedback experiences and generate practical strategies, informed by contemporary feedback theories, to support pharmacists’ and other health care professionals’ learning in healthcare settings.

Workshop Interactivity The workshop will be interactive with activities based on the learner-centred approach, program familiarisation, explanation of theory and brainstorming for translation into practice.

WORKFORCE RETENTION: IT’S TIME TO BUILD OUR WORKFORCE

Shaun Drummond¹

¹Metro North Hospital and Health Service, Brisbane, Qld

A cultural shift is underway in Australia’s largest public health care service, Metro North Hospital and Health Service, who are putting values in action.

Values in action encourages our staff to live out five values - respect, compassion, integrity, high performance and teamwork. A positive organisational culture leads to better patient outcomes, and it’s this philosophy that underpins our values in action movement.

The framework behind Values in action is all encompassing. It is improving systems by providing employees up to date systems consistent with the delivery of patient-centred care, opportunities in career progression and professional development.

It creates a more positive and engaged workforce that celebrates staff achievements, promotes safety and respect and fosters a culture where people have pride in their role.

Through values based recruitment, new staff will be fully immersed in our values culture right from the beginning of their Metro North journey.

For patients, values in actions means reduced length of stay, better quality of life and a happy hospital experience.

Each opportunity to perform a healthcare activity, is an opportunity to put our values into action.

Our 19,000 staff are on their way to helping Metro North become Australia’s biggest, best, and nicest health care service.
WHEN TIME IS SHORT: NEONATAL & PAEDIATRIC PALLIATIVE CARE

Deborah Gilmour

1Royal Brisbane and Women’s Hospital, Qld

Palliative care is a multi-disciplinary specialty with expertise in supporting children and families throughout the child’s life and continuing into bereavement. Paediatric palliative care provides medical, psychosocial, emotional and spiritual support, in a developmentally appropriate manner, to the infant or child, and their family.

Infancy (<1 year) is the most common time to die in childhood – from 2012-2015 the Australian infant mortality rate was 3.4/1000 livebirths. 1 Foetal death is more frequent (7/1000 births);2 and Australian combined perinatal mortality was 9/1000 births in 2016. 2 The most common cause of death in this group is congenital abnormality. 2 Prenatal diagnosis presents an opportunity to assist families to enjoy their child’s life, whilst simultaneously preparing for their death, and may facilitate provision of comprehensive palliative care, irrespective of the brevity of the child’s life.

Whilst there were 3265 infant deaths in Australia from 2011-2013 (361 deaths/100 000 infants), 3 there were 1441 child (1-14 years) deaths in that period (12 deaths/100 000 children). 4 The most common cause of death in this group is congenital abnormality. 2 Prenatal diagnosis presents an opportunity to assist families to enjoy their child’s life, whilst simultaneously preparing for their death, and may facilitate provision of comprehensive palliative care, irrespective of the brevity of the child’s life.

Managing the end of life care of infants and children brings with it many complexities, requiring creativity and flexibility. Symptom management, including pharmacotherapies, requires comprehensive planning for multiple contingencies because time is short, and time is precious.

WHEN TIME IS LIMITED: MANAGING LIFE-LIMITING ILLNESSES

James Stevenson

1The Prince Charles Hospital, Metro North Hospital and Health Service, Qld

As palliative care has developed into a specialty over the last 50 years, there has been a steady increase in referrals to services and a trend to refer patients earlier in their disease trajectory. Palliative care now provides care that is far broader than merely care of the dying, to a growing total number of people who may be followed for months and even years. As patients in palliative care live longer, we are faced with the complexities of managing chronic medical morbidities that coexist with their life-limiting illness. Patients frequently take multiple medications as advised over months or even years before the introduction of palliative care. This is complicated by the addition of symptom-specific medications in the palliative phase. Polypharmacy can lead to adverse reactions and interactions as well as practical and financial concerns. The relative risks and benefits of therapies change over time especially with physical changes towards the end of life and it is important to review and rationalise appropriately. Practitioners frequently encounter the conundrum of discontinuing treatments for chronic comorbidities. More recent advances in certain illnesses, such as newer cancer treatments are also leading to increased survival and prognostic uncertainty in illnesses previously assumed to be more rapidly fatal. Contradiction of past advice and confrontation of mortality.

WHEN TIME IS ENDING: MANAGING END OF LIFE CARE

Clive Eakin, Jennifer Gallagher

1Logan Hospital Metro South Health, Qld

It has long been established that most Australians would prefer to die at home, however the reality is that instead we die mainly in hospitals or other health care facilities. There are many barriers to dying at home, one of which is need for rapid access to medications to provide symptom relief and comfort.

Brisbane South Palliative Care Collaborative (BSPCC) is the research and development arm of Metro South Palliative Care Service (MSPCS). In 2009 BSPCC piloted and evaluated an education and resource package designed for lay caregivers who are required to administer subcutaneous injections to palliative patients for symptom management in the home setting. Over the past decade this system has been utilized successfully by MSPCS and has allowed comfortable end of life care in the home setting, that would not otherwise have been possible.

An exciting recent development, funded by the Australian Government’s Department of Health, is the rolling out of similar resources across Australia that will support people to be cared for and to die at home, if that is their choice. The project is entitled “Caring@home”. (www.caring@homeproject.com.au)

This presentation will provide details of the types of end of life comfort medications that are used within our service. It will also outline the mechanisms and resources that are utilised for the teaching and safe delivery of these medicines by the lay caregivers to the dying person.

References

DEMYSTIFYING THE QT IN TOXICOLOGY

Kath Isoardi¹

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Drug induced QT prolongation is a common concern following deliberate self-poisonings despite it being an uncommon consequence of overdose. The risk of drug induced QT prolongation and subsequent arrhythmia (torsades de pointes) is often overstated resulting in unnecessary investigation, management and periods of monitoring.

This overview will include a practical approach to the assessment of the QT interval, including its measurement, correction for heart rate and the threshold for a prolonged QT interval in the toxicological setting. Causes of QT prolongation will be discussed with a particular focus on drug-induced QT prolongation. Common myths regarding the QT interval and QT prolongation will also be addressed.

"TIME=BRAIN": ADVANCES IN ACUTE STROKE MANAGEMENT

Darshan Shah¹, Judith Coombes¹

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Outcomes after arrival at a hospital emergency department with a stroke are strongly time dependent. A “Code Stroke” response was implemented during working hours at the Princess Alexandra Hospital’s comprehensive stroke centre in September 2016. Key components were ambulance pre-notification of the stroke team, transferring patients direct to the computed tomography (CT) scanner and commencing thrombolysis in the CT scanner.

The hospital’s implementation of the "Code Stroke protocol" has driven down the median time from arrival at hospital to thrombolysis from 92 minutes in 2015 to 25 minutes in 2017. Since the protocol, 93% of patients eligible for thrombolysis were treated in the so-called "golden hour", meaning the hospital’s treatment timeframes are now above national standards and comparable to international benchmarks. Increase in thrombolysis along with extended time frames for endovascular clot retrieval has provided the opportunity for dramatic improvement in outcomes for those with an acute stroke.

With recurrence rates of 3% to 15% at 90 days after a minor stroke or transient ischemic attack (TIA) and a cumulative risk of approximately 30%, patients need secondary prevention of stroke to sustain the benefit of acute interventions. Poor adherence to medications is a major barrier to effective secondary prevention. Systematic reviews of interventions to improve adherence to medications for secondary prevention of stroke found that between 17% and 50% of the interventions have been successful. One of the review authors recommended future interventions require improved design of feasible long-term interventions, objective adherence measures, and sufficient study power to detect improvements in patient-important clinical outcomes. We propose that a well-structured conversation (patient-centred educational exchange) about medications after a stroke may be time well spent.

"GETTING THERE AHEAD OF TIME": EXPLORING THE ROLE OF MEDICINES IN PRE-HOSPITAL EMERGENCY CARE

Steve Rashford¹

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The Queensland Ambulance Service (QAS) undertakes approximately 1.3 million responses per annum from over 290 response locations. With nearly 4,000 paramedics forming part of this mobile health workforce, there are significant challenges in medicines management. The QAS has undergone significant evolution in this area over the past 5 years, including the addition of a clinical pharmacist and the impending expansion of that area in 2019. As an organization, the QAS has been an industry leader in the development of novel therapeutic approaches to difficult clinical management challenges. This presentation will examine a number of new therapies in the areas of acute coronary syndromes, acute behavioural disturbance, procedural sedation and the evolving nuanced care of the critically bleeding patient. Focus will be on the development, implementation and quality audit in an evolving regulatory environment for paramedics.
TIME FOR DIGITAL INNOVATION IN HEALTH

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The digital world has, and is, affecting us in all avenues of life. We are just grasping the digital nettle in healthcare, recognising the opportunities this presents to iteratively improve patient outcomes and experience, to transform from descriptive (retrospective) to predictive and prescriptive analytics at a population level, and to deliver highly personalised and precision medicine at an individual level. From a business perspective, digital technology will underpin the affordable and sustainable system needed to deliver these benefits to individual patients, and to the population as a whole.

So just what is digital transformation and how does it work for busy clinicians whose primary focus is providing high quality care to the patients they see day in and day out?

Digital transformation in its essence is about data - generating it, aggregating and analysing it, and then feeding back the results of those analyses to better inform decisions whenever and wherever they are made across the healthcare landscape.

Healthcare data is, and always has been, generated at the point of interaction between a clinician and a patient. Collecting that data and analysing it for patterns of disease presentation and response to treatment forms the basis of the practice of medicine today. Luminaries such as William Osler made an art form of clinical observation and pattern recognition based on the meticulous recording, analysis and sharing of data. The difference today is our unprecedented capacity to generate, record, analyse and share data and information via digital platforms and technology. Digital technology and the power of information will disrupt the way we provide healthcare, and in doing so, lead to the system transformation that is so necessary to enable us to deliver the triple aim – better patients outcomes, a better patient experience and affordability.

The prize at the end of all this is the creation of a learning and knowledge based system that will enable us to be increasingly precise in the way we deliver care to patients, to enhance our ability to improve health at a whole population level, and to provide information in real time for informed decision making, with the combination of these three enabling a sustainable system dynamic into the 21st century.

REAL TIME USE OF DATA

Clair Sullivan1

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Abstract not available at time of printing.

CLINICAL INFORMATICS PHARMACIST: IS IT TIME?

Erica Tong1

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This presentation will describe the emerging leadership role of the pharmacist within the health informatics team, focusing particularly on the critical role of pharmacists in the implementation phase of electronic medication management (eMM) in the hospital setting. Identify pharmacists’ transferable knowledge and skills that can be utilised within the health informatics sphere, beyond eMM.

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Clinical Informatics Pharmacist. It’s a new and exciting role that’s emerged out of the Health Informatics age we’re currently propelling towards, but once the ‘Go Live’ has been and gone, what do we actually do on a day-to-day basis? And how do we work together with IT professionals and clinicians at the bedside to continually improve workflows, health knowledge, and ultimately patient safety?
**BRING YOUR TEAM ALONG TO HAPPY HOUR**

**Dominic Tait**¹

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**Background** Health care organisation of all sizes experience different level of changes over time.

It is one of the privileges of leadership to create an atmosphere of effective adaptation. The best organisations have leaders that know how to lead through change as well as bring out the best in their teams during times of uncertainty.

**Objectives/Methods** Through the use of a real-life case example of merging two large and complex tertiary hospitals into a single state-wide paediatric facility, we will explore the important lessons of team building that you won't find in a leadership textbook.

We will explore the foundations that support the creation of cohesive and productive healthcare teams in a complex and changing environment and share insights into how this rapid partnership between two pre-existing hospitals created the platform for teams at various levels to be more innovative, change ready and integrated.

Finally, we will take a closer look at how various leadership styles can either foster or constrain high performing and satisfied health care teams - working outside of the silos of a department or service line to truly achieve integrated and person-centred healthcare outcomes.

**Conclusion** To successfully lead a team, one needs to create the environment conducive for teams to truly connect with its identity and vision.

**TRAVEL BACK IN TIME**

**Jane Booth**¹

¹Monash Health, Vic.

Enriching career paths rarely follow a linear trajectory. Early career professionals and their peers, colleagues and managers are all presented with opportunities and challenges along the way. Jane is a mid-career pharmacist, podcast host, social media curator and novice cellist. She is sharing her story to assist other people on their journey. The session will discuss difficulties and enablers that early career professionals (and those who manage or work with them) may be faced with. In this session we will explore how early career professionals and the people that they work with can learn and develop from the opportunities and challenges presented when faced with common scenarios:

- Taking an opportunity as an early career professionals
- Managing stress and promoting self-care
- Stepping into “big shoes”
- Finding your voice
- Knowing when it is time to leave
- Building work-life balance and good mental health practices into daily life.

“Don't be satisfied writing stories how things have gone with others. Unfold your own myth.” Rumi

**NEVER GIVE UP, GREAT THINGS TAKE TIME**

**Jason Roberts**¹

¹University of Queensland, Qld

Working as a healthcare professional in a complex healthcare environment, can be highly challenging. There can be constant demands for your time, from multiple interest groups relating to clinical care, administration, teaching/mentoring, research and management. Trying to meet all of these expectations and flourish under the associated pressures is difficult for many and it is not part of undergraduate or post-graduate training. In order to ensure a sustainable and successful career that meets the goals you may set when you first start out, where you then don't become frustrated and/or demotivated, self-care is important. Self-care is enabled by self-awareness and this can be accomplished by the common theories of motivation. Once understood and enacted, can of course lead to successful self-motivation as well as motivation of others. To this end, creating achievable career goals that can be both short and long term, are highly appropriate. However, understanding the importance of not over-reaching, or rushing to overall goals is important as is the need to be rounded in one's development, across all domains of clinical skills, management, mentoring and research.
TIME TO REDESIGN

Dan Guidone¹
¹The Society of Hospital Pharmacists of Australia, Vic.

To continue to meet the evolving needs of patients, the healthcare workforce must adapt and advance. Despite being present in almost every hospital pharmacy department around the country, pharmacy technicians in Australia are yet to consistently practice to their full scope of practice – we have one of the most underdeveloped systems for utilizing our technician and assistant workforce in the OECD.

Improving how we use this critical workforce is not just about career progression – it has a national and global impact on patient care, and technicians are a key part of the International Pharmaceutical Federation's workforce development plans.

SHPA's technician redesign project aims to help this workforce develop. In this presentation, we will revisit our vision and our project scope, assess where we are up to, and discuss one of the key pillars of the program – how our technicians can provide better support in the clinical pharmacy setting.

TIME TO COLLABORATE

Rhiannon Braund¹
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This session will outline the implementation of a Pharmacy Accuracy Checking Technician (PACT) into the NZ Pharmacy workforce. A specific focus will be on the need for collaboration both within the individual pharmacy and the pharmacy sector to overcome both real and perceived hurdles. Further, data will be presented that highlights how task distribution within the Pharmacy workflow allow increased patient care and opportunities for new initiatives.

TIME TO INNOVATE

Tricia Holmes¹
¹SA Pharmacy, SA

SA Pharmacy is undertaking a transformational workforce development program to improve service delivery to patients. An initial project involved the delegation of problem-solving activities from the pharmacists who traditionally managed them to assistants who had been trained and formally assessed as competent to undertake these tasks. We undertook a systematic and team-focussed process that identified opportunities for service redesign, then developed a set of training, competency assessment and task delegation tools. We implemented a clear and systematic approach to task delegation, and then supported the development, nurturing and sustainment of new roles and competencies. Over a relatively short timeframe we have been able to achieve a marked increase in the ability of the assistant workforce to solve problems that historically were seen to be outside their scope of practice. The initial work was undertaken in the dispensary of The Queen Elizabeth Hospital, but the process has proved to be applicable across all sites in SA Pharmacy, promoting statewide consistency of practice, the standardisation of service delivery, and supporting flexibility of staff movement between sites. Outcomes of this work include significant efficiency gains in terms of the time to process items through the dispensary, the promotion of evidence-based treatment through adherence to antimicrobial restriction guidelines and the SA Medicines Formulary, and improved communication between the dispensary and clinical teams. This program has also had an impressive effect on the assistant workforce with increased morale, heightened levels of job satisfaction, greater confidence in their ability to deal with complex issues and strengthened engagement in their day to day work.
Conclusion Cloud-based PES data repositories provide an additional information source that may assist health professionals with collating a BPMH. However, it is important to be aware of their limitations. Confirmation of medication histories with patients and/or other sources remains crucial.

NEWLYWEDS: PHARMACY STAFF & PHARMACY ROBOTS
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Aim Identify human factors that have long lasting impacts on staff attitudes towards the introduction to pharmacy robots.

Methods A validated staff survey exploring a tertiary hospital pharmacy staff perceptions and attitudes toward the implementation of a pharmacy dispensing robot delivered in two phases:
- Phase 1: Pre-implementation – Immediately prior to ‘go live’
- Phase 2: Post implementation – 12 months after ‘go live’

Comparative analysis, descriptive statistics, chi square and spearman & rank used to identify significant correlations over time

Results A predominantly young (62% under 35), female (79%), educated population (73% tertiary education). No demographic factors such as age or education correlated with staff acceptance of technology.

Staff understanding of the benefits of the robot had a positive high correlation with perceived usefulness sustained over time (β = 0.75**). Perceived ease of use had a low correlation between staff understanding of benefits (β=0.41*).

Influential staff members (e.g. Team leaders) have the greatest impact on staff perception of benefit, which then had a positive impact on staff perception of quality, relevance to their job and overall attitude.

Influential staff members had a direct impact on how useful staff perceived the system to be and their intention to use the system which was sustained over time.

Conclusion Sustained positive implementations of robotics rely on engaged leaders and clearly communicating the benefit of the robot for long lasting effects.

*p<0.05, ** p<0.01, *** <0.001

IMPACT OF AUTOMATED MEDICATION DISTRIBUTION SYSTEMS ON NURSING TIME IN AN EMERGENCY DEPARTMENT
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Aim To investigate the impact of un-profiled Automated Medication Distribution Systems (Pyxis Medstation™) on nursing time spent on clinical and non-clinical tasks, and efficiency of medication management in an Emergency Department (ED).

Methods An observational time and motion study of ten ED nursing shifts was conducted at baseline and three months after Pyxis implementation using the Work Observation Method By Activity Timing (WOMBAT) software. Data were compared using descriptive analysis, Chi-square and Mann Whitney U tests.

Results Nurses were observed in total for 80 hours pre- and 81 hours post-implementation. Both the median time and the proportion of total time spent on direct care significantly increased after Pyxis implementation (53 vs. 63 seconds; p=0.001, and 17% vs. 23%; p=0.001, respectively). Time spent on medication tasks increased from 8% to 10%. Medication preparation time increased from 2% to 4%, with the median time increasing from 39 to 86 seconds. Time
spent on controlled drug recording during administration decreased from 14% to 2%. The rate of both interruptions and multitasking during medication tasks was significantly lower after Pyxis (6.4% vs. 2.7%; p=0.012, and 33% vs. 13%; p<0.001, respectively). Nurses where observed waiting to access Pyxis machines only 0.4% of time (19.5 minutes).

**Conclusion** The implementation of Pyxis machines has enabled ED nurses to spend more time caring for patients. While more time is spent on medication preparation post-implementation, time is also saved from the removal of some tasks such as controlled drug documentation. Pyxis machines did not affect timely access to medications.

**IT’S TIME TO GO PAPERLESS: ENKEY–AUSTRALIA’S FIRST HOSPITAL-WIDE ELECTRONIC DRUGS OF DEPENDENCE MANAGEMENT SYSTEM**

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**Background** Australia is grappling with achieving the appropriate balance between access and security of restricted drugs of dependence (DD) medicines. Traditional paper records are no longer adequate to meet DD management, audit and security requirements within the complex contemporary health environment.

**Aim** To create and implement an electronic DD management system within a multi-campus tertiary teaching hospital.

**Methods** Initial scoping was performed between the Decision Support Unit, Pharmacy and Nursing staff to determine existing workflow. Legislative requirements were thoroughly reviewed. Agile development methodology was utilised to create a rapid cycle time between development and user feedback.

The program was piloted on a surgical ward. User feedback in the clinical environment highlighted areas for improvement.

Training and credentialing of all Pharmacy staff was conducted.

**Results** The program went live in all sub-stores of the Pharmacy department in February 2018, completely removing paper records. The program is now being progressively deployed to all wards in the health service.

To date 11 pharmacy sites and 17 wards are using the system. The pilot ward reports a 50% reduction in time taken to complete the administrative records required for DD medicines. Gaps in the paper register system which could lead to abuse or misuse have been closed. Legislative compliance has improved and our auditing capacity is now more comprehensive than ever.

**Conclusion** This novel Australian first DD management system now completely replaces paper-based records. Improvements continue to be made based on user feedback. This system has potential to be implemented at other health services.
PERCEPTIONS OF RESIDENT PHARMACISTS ON THE LOCAL RURAL SHPA RESIDENCY PROGRAM

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Aim To evaluate and quality assure the local SHPA Residency Program through the exploration of resident pharmacists’ (RPs) perceptions.

Methods Quality Assurance Evaluation (QAE) was conducted twelve months after program initiation. RPs reflected on and described their perceptions of residency experiences through guided questioning with two Residency Leadership Committee members.

Results Forty-one benefits of our program were identified. Benefits were aligned within six themes: opportunities derived from the program structure (n=10); receiving feedback (n=8); extension of scope of practice (n=6) and expansion of clinical knowledge (n=6); leadership and management (n=6) and skill development in communication (n=5). The only negatives related to: stress during observations of practice and the increased workload of self-directed learning and portfolio development.

The RPs acknowledged their portfolio documents and feedback reflected expanded clinical knowledge and skill level; increased depth of clinical reviews and more comprehensive patient-focused approaches. RPs reported the frequent program feedback requirements improved their capacity to advocate for changes in medication management and appreciation of their enhanced value to patients and the multi-disciplinary clinical team. They recognised the unique program benefits that enabled expansion of their scope of practice to clinical areas, previously without on-site pharmacy staff. They valued the opportunities to undertake an interstate site visit, conduct a research project, attend grant-funded clinical seminars and receive interactive training with expert pharmacists from across the health service.

Conclusion The recognised benefits of the local SHPA residency program extended beyond the individual resident pharmacists to encompass our patients, other hospital staff and our profession.

PORTFOLIOS OR OSCES?

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Aim In 2017 SHPA implemented a Foundation Residency program to formalise departments’ competency based, workforce education training and development. Our aim was to explore the pharmacists’ perceptions of a structured residency program, to identify what did and did not contribute to individuals’ development.

Methods Ten pharmacists presented their portfolios to a panel of six senior pharmacists. Following presentations, structured feedback was sought from residents about the process of using a portfolio to evaluate competence and opportunities for development.

Results Residents initially considered it onerous to have continual evaluation and feedback, together with a reflective portfolio. In hindsight they found much of the work could be completed as part of their daily role.

Residents’ perceptions were mixed regarding the value of competency-based performance development tools such as a ClinCAT, mini Clinical examination, case-based discussions and multi-source feedback. However, all saw the value for self and peer evaluation as well as receiving feedback to assist in a continual development plan.

Residents felt that an exam such as a simulated Objective Structured Competency Examination (OSCE) would be of less value than a portfolio evaluation for the purposes of their own development.

Conclusion The first year of running the residency allowed a quality assurance of local workforce development processes. Whilst OSCEs have a place for summative assessment, feedback identified that a portfolio using evidence from the work place, with continual feedback, was more desirable than an oral exam, to evaluate what pharmacists “do” rather than show what they “could do”.

TIME FOR EQUITABLE ACCESS TO EXPERIENTIAL LEARNING FOR BOTH STUDENTS AND PRECEPTORS

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Aim To increase capacity and capability of preceptors to provide hospital-based experiential learning placements for fourth year pharmacy students enrolled in a BPharm (Hons) programme.

Methods A state-wide led pharmacist role (0.6 FTE) was developed in a partnership between the University and hospital pharmacy service. Learning objectives, placement structure and preceptor support program was developed through key stakeholder consultation, which included workshops for students and preceptors and an educational visiting program.

A pre and post placement survey of preceptors, and a post placement survey of students was undertaken to gain feedback on the preceptor and experiential learning program.

Results In the year prior to implementation of this program 27% of undergraduate students undertook a 4- or 8-week hospital placement. In the first year of the program (2017) all 124
undergraduate students completed a 3-week hospital-based experiential learning placement, across 13 sites, which was extended to 6 weeks in the second year based on preceptor and student feedback.

There were 86 responses from 123 preceptors (70% response rate) in the pre-placement survey, and 64 responses in the post-placement survey (52% response rate). Overall the preceptors agreed that the preceptor training prepared them well for providing feedback, understanding what is expected of them and the student, minimising the impact of teaching on their day to day workload and being an effective teacher.

Conclusion Implementation of a preceptor support program utilising multiple methodologies in behaviour change supports the implementation and expansion of a student experiential placement program.

MENTORING IN HOSPITAL PHARMACY: INVESTIGATING THE DEVELOPMENTAL NEEDS OF PHARMACISTS

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Aim To investigate the professional and personal development needs of pharmacists to inform the development of a mentoring program.

Methods A qualitative study was undertaken at a multi-site, metropolitan health service. Pharmacists completed an anonymous survey to describe their understanding, needs, expectations, concerns and preferences of mentoring. Survey results were analysed to identify key themes.

Results Sixty-one pharmacists (28%; 61/219) completed the survey, with early (55%), mid- (25%) and late- (20%) career pharmacists represented. A mentoring program was desired by 94% of respondents and similar numbers were willing to be mentees (89%) and/or mentors (86%). Potential mentees mostly wanted assistance with their career (69%; 34/49) and knowledge (65%; 32/49) development through support, guidance and advice from experienced mentors. Respondents stressed the importance of confidentiality and sufficient mentor capability and time, with mutual trust, rapport, respect and communication required for a successful relationship. Most respondents (61%; 25/41) preferred an assigned pairing process and were marginally more interested in a self-directed mentoring relationship than other mentoring models.

Conclusion Understanding the professional and personal needs of pharmacists is an important first step in developing a mentoring program. Key themes identified related to both needs of mentees (career and knowledge development) and expectations for mentors (capability, time and confidentiality) and are generalisable to other settings. Designing a mentoring program aligned with the needs and preferences of pharmacists will contribute to the success and sustainability of any program developed, and ultimately assist pharmacists to improve patient and professional outcomes.
IMPLEMENTATION AND EVALUATION OF A POST DISCHARGE AND HIGH-RISK MEDICATION SERVICE IN A RURAL SETTING

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Aim To determine the impact on medication misadventure and acute service use of a post discharge and high-risk medication service delivered in an outpatient setting and via telehealth into patient’s homes.

Methods This is a descriptive study utilising quantitative methodology to collect data prospectively as well as pre- and post-intervention. Primary outcomes are the subjective and objective measured change in medication adherence and the SF-12 health survey quality of life (QOL) scores compared to baseline at three and six months post intervention. Secondary outcomes include the number of identified medication-related problems (MRPs), the number of resolved MRPs and the grading of clinical significance of the MRPs.

Results Of the 40 patients currently consented for research a complete dataset is presented for 14. Preliminary data demonstrates an increase in subjective medication adherence at three months continued through to six months. Preliminary mental component summary of QOL data is considerably lower for patients at discharge compared to the high-risk patients and to baseline. So far 223 MRPs have been identified, an average of 4.46 MRPs per patient.

Conclusion Preliminary data is demonstrating that pharmacist consultations for both post-discharge and high-risk medication patients can increase self-reported medication adherence which is sustained at six months. The preliminary mental component summary QOL data may contribute to evidence that patients in the immediate post discharge period are at most risk of medication misadventure. Further work on this study will complete evaluation data and measure the impact on acute service use.

SHARING THE CARE: HOSPITAL AND COMMUNITY PHARMACY PARTNERSHIP FOR GLUCOCORTICOID INDUCED DIABETES (GID)

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Aim To assess the feasibility of a novel community-based program for the monitoring and management of GID among cancer patients discharged from hospital on high-dose steroids.

Methods Mixed methods analysis of operational feasibility (eligibility criteria and referral, uptake, and retention rates) and interim findings from qualitative assessment using in-depth interviews (grounded theory methods) exploring barriers and enablers to program enrolment.

Results The program was developed by a multidisciplinary working group including consumer engagement to raise awareness and facilitate patient access to blood glucose monitoring. Decision support algorithms and referral pathways were developed with community pharmacy to monitor and respond to blood glucose level and HbA1c test results.

In the first ten months (Oct-17-Jul-18), 75% (45/60) of eligible patients consented to enrolment. Approximately half attended community pharmacy appointments (n=24) or successfully obtained alternate methods of monitoring (n=6). Reasons for non-attendance included early cessation of steroids (n=3), distance/time constraints (n=4), hospitalisation/death from other causes (n=4), or other (n=4).

Interim review of qualitative data from patient interviews also identified inadequate understanding of program intent, and time consumption as barriers to participation. Enablers included concern for personal health and endorsement from healthcare professionals.

Conclusion A shared care model between hospital and community pharmacy for minimising untreated GID was found to be feasible and safe, leading to expansion of the program to patients at higher risk of GID. Future efforts will focus on reducing barriers to patient acceptance and compliance with the program.

IMPROVING THE PROCESS OF PROVIDING ACCURATE MEDICATION CHARTS FOR HOSPITAL IN THE HOME PATIENTS

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Aim To compare the rate of pharmacist conducted medication reconciliation for patients transferred to the Hospital in the Home (HITH) program before and after introducing a new structured workflow for HITH nurses and clinical pharmacists.

Methods A pre- and post- cross-sectional audit at three acute metropolitan hospitals was undertaken. The rate of HITH medication chart reconciliation was measured before and after a new process was introduced. The intervention involved a new process for HITH nurses to leave HITH medication charts on the wards to allow clinical pharmacists to undertake reconciliation. Pharmacists were instructed to document the completion of reconciliation by signing the HITH medication charts. High-risk patients transferred to HITH during business hours were included. Patients transferred from areas without a clinical pharmacy service or outside pharmacy hours were excluded. Chi-squared test
was used to compare the pre- and post-intervention data.

**Results** 98 HITH patients were audited (pre: 50, post: 48) and 46 (pre: 28, post: 18) met the inclusion criteria. Clinical pharmacist medication reconciliation improved from 14.3% (n = 4) pre to 94.4% (n = 17) post intervention (p < 0.00001). The percentage of HITH patients identified as high risk remained unchanged (pre: 72.0%, post: 70.8%). An increase in the portion of patients referred to HITH program from areas without a clinical pharmacy service was observed (pre: 16.7%, post: 41.6%).

**Conclusion** The implementation of a workflow improvement strategy resulted in an increased rate of medication reconciliation by clinical pharmacists on transfer from acute hospitals to HITH program.

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**SPECIALIST PHARMACISTS IN THE COMMUNITY PALLIATIVE CARE SERVICES: A QUALITATIVE EXPLORATION OF STAKEHOLDER PERSPECTIVES**

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**Aim** To explore stakeholder perspectives about the gaps in the current model of community-based palliative care (CPC) services focusing on medication management incorporating opinion as to whether the introduction of a specialist palliative care pharmacist might address some of those gaps.

**Methods** Separate focus groups were conducted with clinicians and consumers associated with a regional Australian palliative care service. An experienced facilitator moderated the discussions, which were recorded and transcribed verbatim. Data were analysed using a framework approach and interpreted in the context of the Chronic Care Model for improving primary care for patients with chronic illness.

**Results** Five major themes emerged: access to resources and information; shared care; challenges of polypharmacy; informal caregiver needs and potential roles of a palliative care pharmacist. Gaps in access to medicines/resources, training for generalist practitioners, communication between treating teams and support for patients and carers were cited as factors adversely impacting CPC. The introduction of a specialist palliative care pharmacist to facilitate access to medicines, medicines information and medicines reviews were deemed likely to address some of the gaps identified.

**Conclusion** While CPC plays an essential role in meeting the health care demands of an ageing society, current model is faced with a number of gaps and limitations in relation to medication management. Integration of an appropriately qualified and skilled pharmacist into the CPC team may help to address some of these gaps. Competency, credentialing and training for such pharmacists will be a matter of consideration if such roles are to be successful.
ACCIDENTAL INJECTION OF ADRENALINE AUTOINJECTORS AS REPORTED TO AUSTRALIAN POISONS INFORMATION CENTRES 2011–16


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Aim There are anecdotal cases of accidental self-injection of adrenaline autoinjectors (AAI) by allergic individuals, family members and health care workers. The rates of accidental self-injection of AAI has not been studied in Australia so we analysed the rate of accidental injection of AAI in Australia from calls to Poison Information Centres (PIC) across Australia characterising the population of those injected, site of injection and treatment advised.

Methods Retrospective review of the PIC call records between 2011 and 2016 from all Australian PICs relating to AAI injections, compared to PBS dispensing data.

Results There were 1140 accidental self-injections (all EpiPen or EpiPen Junior), a rate of 1.8 accidental AAI injections per 1,000 AAI dispensings per year. 58% were male and 65% occurred in children. Many described the incident occurring whilst practicing or ‘playing’ with the AAI. The majority of cases (95%) were managed at home. Injection sites were: thumb/finger (41%), palm (14%) or thigh (5%). Usually no symptoms were present (55%), although local pain (23%), pallor (8%) and paraesthesia (4%) were not uncommon. PICs usually suggested local measures only (98%) (immersion in warm water and/or massage), and in 1.8% of cases GTN to the affected area was suggested in a medical facility.

Conclusion AAI self-injection is not uncommon and likely under-reported. Digits are the most common site injected, most reported features were but symptoms are mild and responsive to local treatment measures. ASCIA Anaphylaxis Action Plans have been updated to advise calling PIC if accidental self-injection occurs.

THE SEVEN AGES OF POISONING: CRADLE TO GRAVE (SNAPSHOT 2015)


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Aim To characterise the types of calls received by Australian Poisons information centres (PIC) and to analyse poisoning exposures by age group, exposure circumstance and types of substances involved.

Methods Retrospective analysis of call records from all four Australian PICs (national coverage).

Results There were 204 906 calls to Australian PICs in 2015, 69.0% from the general public, 27.9% from health professionals; 16.2% of calls originated from hospitals. 170 469 calls (including re-calls about an exposure) related to 164 363 poison exposure events; 64.4% were unintentional, 18.1% were medication error, and 10.7% involved deliberate self-poisoning. Most exposures were of 20–74-year-old adults (40.1%) or 1–4-year-old toddlers (36.0%). The PICs advised callers to stay at home for 67.4% of exposures, and to present to hospital for 10.9%. The most common substances involved in exposures were household cleaners (10.2%) and paracetamol-containing analgesics (7.3%). Exposures of infants and toddlers were most frequently to household cleaning substances (17.8%, 15.3% respectively) and personal care items (6.6%, 7.3%); callers were usually advised to stay at home (88.5%, 86.4%). Deliberate self-poisoning (49.1%) and hospital referral (23.9%) were most frequent for adolescents. Exposures of adults (20–74 years) frequently involved psychotropic pharmaceuticals (17.8%) or painkillers (15.1%). Exposures in adults over 74 were typically medication errors involving cardiovascular (23.6%), anticoagulant (4.6%), or anti-diabetic (4.1%) medications.

Conclusion Poisoning is a significant public health problem throughout life, but the nature of the hazards differs markedly between age groups. PIC data could inform strategic public health interventions that target age-specific poisoning hazards.
intervention audit reviewed key intervention measures for 50 patients.

Results Average LOS for all patients reduced from 4.5 days to 3.7 days. Average LOS for unplanned (Emergency) admissions reduced from 5.4 days to 3.8 days. Presence of electronic Adverse Reaction Alerts increased from 6% to 72%. The indication PARKINSON'S on the med chart increased from 19% to 36%. ADR/allergy box warning for dopamine antagonists increased from 24% to 76%. Doses not administered reduced from 10.6% to 4.4%. Doses administered > 15 minutes late was reduced from 6.5% to 2.9%. Nurses documenting the abbreviation N (Not Available) reduced from 1% to < 0.1%. Missed doses due to patient absence was reduced from 0.2% to < 0.1%. Occasions where medications were withheld was reduced from 4% to 1.2%. Dopamine antagonist prescriptions decreased from 22 orders to 4 orders.

Conclusion Implementing simple PD prompts and education successfully reduced LOS and improved surrogate markers of patient safety.

EVALUATING THE IMPACT OF A REFORMED 7-DAY PHARMACY SERVICE IN TWO AUSTRALIAN PUBLIC HOSPITALS

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Aim To describe the components and impact of a reformed pharmacy service provision model on pharmacy staff and medication safety, two years post implementation.

Methods A six item electronic survey was sent to all pharmacy staff regarding satisfaction with the reform and suggestions for improvements. The impact on medication safety for admitted patients was measured by reviewing the monthly completion rate of medication action plans (MAPs) and discharge medication records (DMRs) in an electronic medication management dashboard.

Results The original model involved 10 pharmacists and 5 pharmacy assistants rostered to work planned overtime on a weekend, with overtime penalty rates paid. The reformed model has 17 pharmacists and 5 pharmacy assistants rostered to full day shifts each weekend, with weekend penalty rates paid. A total of 45 of the 98 eligible staff responded to the survey (response rate: 46%). The majority (n=33, 73%) were very satisfied or satisfied with the change, with 91% (n=41) considering patient care had improved and 93% (n=42) satisfied with the rostering tool used. The average number of MAPs completed increased 7-fold (16 to 117 MAPs) and average number of DMRs completed increased 3-fold (77 to 245 DMRs). Staff feedback predominantly related to further expanding the service, high workload, staff skill mix, rostering practices and Monday and Friday staffing levels.

Conclusion The reformed pharmacy service delivery model improved medication safety on the weekends, with staff satisfied with the reform. Consultation with staff will continue to identify solutions to issues raised via the survey.
Aim

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Roadmap.

Long term strategic workforce planning

standard, established a workforce

strategist, following the

Roadmap. Key messages were flexibility

achieved.

strategies, their priority and timelines to

process we have undertaken, the

executive approved the sound final

assessing strategies ensuring that

themes were workshopped by additional

attracting and retaining workforce,

emergent themes. With the goal of

workforce data story identifying

data were used to write an objective

workgroup reviewed the raw staffing

demographic data, building questions for

a staff survey to test

theories/assumptions arising from the

data. Champions additionally engaged

our workforce in completing the online

survey. Survey results and demographic

data were used to write an objective

workforce data story identifying

emergent themes. With the goal of

attracting and retaining workforce,

themes were workshopped by additional

staff, developing, refining and risk

assessing strategies ensuring that

executive approved the sound final

strategies. Executive used a prioritisation

tool to further inform the 5-year

workforce Roadmap which outlines the

process we have undertaken, the

strategies, their priority and timelines to

achieve.

Results

A 79% survey response yielded

persuasive evidence to inform our

Roadmap. Key messages were flexibility

to move within the organisation, flexibility

in hours worked, access to promotional

opportunities, and opportunities to

develop/learn and expand.

Conclusion

Pharmacy has established a

Workforce Roadmap setting the strategic

direction for the next five years. The

Roadmap serves to meet identified needs

and priorities of staff and the health

sector promoting a flourishing and

contemporary workforce.

Building research culture and

increasing capacity, one abstract

at a time

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Aim To describe and evaluate a new

collaborative model between a Hospital

Pharmacy Department and University

Discipline of Pharmacy for building

research capacity and culture within the

hospital setting.

Methods A new model of collaboration

with a University-employed academic

based one day a week within the

pharmacy department of a large

metropolitan teaching hospital

commenced in April 2018. The academic

attended existing regular Pharmacy

Practice Development research group

meetings. A continuing education session

on getting started in research and writing

a research protocol was conducted. In

addition, the academic was available

weekly within the department for

informal one-to-one (and one-to-many)

meetings with pharmacists interested in

designing projects, preparing proposals,

submitting grants and writing abstracts.

Results In the 4-month period between

April 2018 and July 2018 enthusiasm and

capacity for research within the

department grew as evidenced by the

increased research-related activity.

Members of the department were

awarded 3 grants totalling $159,000, 2 in

collaboration with the Academic. Over 22

abstracts, approximately 1 for every 3

pharmacists in the department, were

submitted to MM2018, as well as 3

technician led abstracts. Many

pharmacists were involved with multiple

abstracts. All abstracts involved within

department collaboration and most were

multidisciplinary.

Conclusion Traditionally, collaboration

between University and Hospital

Pharmacy departments has focused on

bringing students into clinical setting, and

clinicians into the academic settings.

While these activities have

unquestionable merit, we have
demonstrated the value, in terms of

research output and culture, of bringing a

University Research Academic into the

Hospital Pharmacy Team.

Working well: supporting the

wellness of our workforce in a

time of change

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Aim To develop a structured and

supported wellness program for

pharmacy staff members, as our major

tertiary multi-hospital network

approaches its largest transformational

change, the implementation of an

electronic medication management

system.

Methods A “Wellness” focus group was

formed from 14 staff volunteers to

brainstorm principles and objectives.

Ideas were presented to Pharmacy

Leadership for endorsement including

current evidence of the importance of

supporting staff health, a sustainable

implementation plan and budget

proposal. Endorsed projects were

established and implemented. Impact

was measured using longitudinal results

of an annual state-wide, externally-
delivered employee opinion survey and

attendance at wellness events.

Results Wellness was established as a

departmental strategic priority; three

fundamental principles were established:

1. Incorporated of wellness into all our

practices, processes and systems; 2.

Facilitation of staff to engage in friendly,

open and honest interactions; 3.

Implementation of an ongoing health and

wellness program.
A number of strategies were developed, resourced and implemented including: 1. wellness integrated in key department decision making, 2. wellness orientation for new staff, 3. a calendar of organised wellness events, and 4. an annual healthy staff program coordinated by intern pharmacists. Activities include daily fresh fruit, walking meetings, plants and healthy workstations, social committee formation, and a department ‘slowpitch’ softball team.

**Conclusion** Wellness of pharmacy staff has been formally agreed as one of the two major pharmacy department priorities for 2018. A structured and resourced program has been successfully developed and implemented across a large hospital pharmacy service.

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THE MISSING LINK: INTRODUCING A COST EFFECTIVE PHARMACIST SERVICE INTO DAY MEDICAL PROCEDURES

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**Background** The Day Medical Procedures (DMP) nurses administer specialised infusions prepared in the pharmacy aseptic suite or outsourced at extra cost to a third party. Pharmacy and nursing worked independently and had difficulty managing patient schedules and infusion preparation timeframes resulting in lengthy waiting times for patients, multiple complaints and staff dissatisfaction.

**Aim** To implement a new pharmacy service into DMP to:

a. Improve patient care, waiting times and scheduling

b. Realise drug procurement savings to fund a pharmacy service and reduce waste associated with cancellations.

**Methods** Consult with Gastroenterology to switch IBD patients from originator infliximab to the biosimilar with savings used to fund a pharmacist.

Collaborate with nursing to create a preparation room within DMP staffed by a pharmacist, and to incorporate new workflows involving the pharmacist with a focus on patient scheduling, screening, infusion preparation and communications.

Utilise closed system devices to prepare infliximab and natalizumab infusions, and BCG bladder instillations.

**Results** Over the last 12 months the average net savings is > $50,000 per month and medication wastage has reduced from more than $27,000 to Nil. For patients, average waiting times decreased by more than two thirds (from average of 47mins to 13mins). Safer patient care and staff support achieved through pharmacist interventions (111), counselling (33 patients) and providing advice to staff (500 occasions).

**Conclusion** The introduction of a new pharmacy service in a day medical procedures unit has significantly reduced waiting times, improved patient care and delivered substantial ongoing net savings.
METHODS

monitoring. A long acting injection (LAI), to determine auditing prolactin levels with paliperidone osteoporosis) prompted this study prolactinaemia (linked to infertility and

Aim

Antipsychotic induced hyper-prolactinaemia (linked to infertility and osteoporosis) prompted this study auditing prolactin levels with paliperidone long acting injection (LAI), to determine whether a pharmacist-led intervention improved the quality of prolactin monitoring.

Methods

Two separate retrospective audits were conducted before and after a targeted intervention strategy to improve prolactin monitoring. The interventions, championed by the pharmacists and inpatient psychiatrists, included education, changing prolactin level timing to be in an antipsychotic-naïve state and a forcing function of delayed medication supply to prompt for baseline levels. Each audit identified the number of patients commenced on paliperidone LAI, and their baseline and ongoing serum prolactin levels (if present).

Results

The first cohort (Jan–June 2015) identified 54 patients initiated on Paliperidone LAI. Of these patients, 31.5% (17/54) had baseline serum prolactin levels taken prior to initiation. Eight patients had incorrect baseline levels performed and 27.8% (15/54) had ongoing monitoring documented after discharge. 37.0% (20/54) had no documented prolactin monitoring performed (neither baseline nor ongoing). The second cohort (Jan–June 2017) identified 51 patients, with 88.2% (45/51) receiving a serum prolactin prior to the first paliperidone administration, indicating a marked improvement at baseline. Subsequent monitoring remained relatively unchanged at 21.6% (11/51).

Conclusion

Pharmacists play an important role in steering quality improvement initiatives and in this case, the successful collaboration with the inpatient psychiatrists, lead to marked improvement in baseline serum prolactin levels, vital to correct diagnosis of drug induced hyper-prolactinaemia. A pharmacist in the community mental health setting could impact on ongoing prolactin level monitoring.

TREATMENT OF CLOzapine-ASSOCIATED OBESITY AND DIABETES WITH EXENATIDE (CODEX): A PILOT RANDOMISED CONTROLLED TRIAL

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Aim

To determine whether the Glucagon-like peptide-1 (GLP-1) receptor agonists exenatide can reduce weight gain associated with clozapine.

Methods

This randomized, controlled, open-label, pilot trial evaluated weekly exenatide for weight loss among clozapine-treated obese adults with schizophrenia, with or without T2DM. A total of 28 outpatients were randomized to once-weekly extended-release subcutaneous exenatide or usual care for 24 weeks. The primary outcome was proportion of participants with >5% weight loss.

Results

All 28 participants completed the study; 3/14 in the exenatide group and 2/14 in the usual care group had T2DM. Six people on exenatide achieved >5% weight loss vs one receiving usual care (p = .029). Compared with usual care, participants using exenatide had greater mean weight loss (~5.3 kg; p = .015) and body mass index reduction (~1.78 vs ~0.39 kg/m²; p = .019), and reduced fasting glucose (~0.34 vs 0.39 mmol/L; p = .036) and glycated haemoglobin levels (~0.21% vs 0.03%; p = .004). There were no significant differences in other metabolic syndrome components.

Conclusion

To our knowledge this is the first ever RCT investigating whether exenatide reduces clozapine induced weight gain. Exenatide may be a promising therapeutic agent for glycaemic control and weight loss in clozapine-treated people with obesity and could assist in reducing clozapine-associated cardio-metabolic morbidity and mortality.

EXPLORING THE INFLUENCE OF PHARMACEUTICAL REPRESENTATIVES ON PRESCRIBING PRACTICES WITHIN A MENTAL HEALTH SETTING

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Objective

To explore the influence on prescribing behaviour after an education session marketing Aripiprazole Long Acting Injection (A-LAI) delivered by a pharmaceutical representative to psychiatrists in a tertiary hospital.

Clinical Features

Prior to the education session, no patients were prescribed A-LAI. One week post, 10 of the 26 patients admitted to the psychiatric ward were prescribed A-LAI. An observational prospective case series followed these patients from April 2015–March 2016 to determine if A-LAI was an appropriate selection. The median age was 36 years (range 29–45), 50% females, and 50% identified as Aboriginal. Seven patients had a history of weight gain or prolonged QTc interval on alternative antipsychotics contributing to the doctor’s decision to prescribe A-LAI.
Case Progress and Outcomes  Two (20%) remained on aripiprazole as of March 2016, both were diagnosed with psychosis and this treatment was deemed successful. Treatment was considered unsuccessful for the remaining 8 (80%). Of these, one patient had bipolar disorder for which A-LAI is not listed on the PBS, 7 were complex and were treated with multiple antipsychotics prior to switching, including 4 previously on clozapine. The readmission rate within 28 days was 50% in this patient cohort compared to 11% within the study jurisdiction and 15% nationally.

Conclusion  This pharmacist-led case series highlights pharmaceutical company influence, and the need for unbiased education. It confirms the risk of inappropriate selection of therapy leading to readmission. The findings were used to develop and deliver an education session to the psychiatrists on A-LAI place in therapy.

TIMELY PRESCRIPTION OF NICOTINE REPLACEMENT THERAPY AND IMPACT ON PATIENT AGGRESSION IN MENTAL HEALTH INPATIENTS

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Aim  Aggression and violence in mental health high dependency unit (MHHDU) inpatients is very common and nicotine withdrawal may exacerbate this. The Bröset Violence Checklist (BVC) is a six-item checklist used to rate acts of aggression in MHHDU inpatients.

We aimed to examine the relationship between the type of Nicotine Replacement Therapy (NRT), time to prescription and patient aggression in a MHHDU at a large tertiary metropolitan hospital.

Methods  77 patients (current smokers) admitted to the MHHDU between Jan-16 and Jan-18 were retrospectively audited. An expert panel of pharmacists and medical officers collaboratively collected information on patient demographics, NRT prescribing and administration, and the patients’ BVC scores recorded during hospital admission. Correlations between BVC scores, NRT type and timing of NRT administration were explored.

Results  Patients who utilised nicotine inhalers showed consistently lower BVC scores (0 – 0.75) than those who used any other form of NRT (0 – 3.33). Lower BVC score indicates low violence risk (BVC=0 small violence risk, BVC=>2 high violence risk).

Use of NRT within the first three days of admission to MHHDU resulted in a clinical meaningful reduction in average BVC scores from 2 to 0.92.

Conclusion  Nicotine withdrawal can become a precipitating factor for heightening aggression and agitation in some patients affecting staff safety. Impact of timely NRT on patient aggression and violence risk in acute MHHDU patients may result in reduced antipsychotic use and needs to be further explored. Pharmacists working in MHHDU should consider NRT for all admitted patients who are smokers.
INTERACTION: A CASE REPORT

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Objective To describe the complex care requirements of a General Practitioner (GP)-managed HIV-positive patient. Referral for medication review was part of a trial by a specialist pharmacist placed in high HIV case-load GP clinics. This case required coordinated management of a drug interaction between inhaled fluticasone and cobicistat.

Clinical Features A 54-year-old HIV-positive male was referred by his GP for a medication review by a HIV pharmacist because of poor glycaemic control (HbA1c 8.2%) and hypertension (140/90). Medications included darunavir/cobicistat, dolutegravir, metformin, glitazide, perindopril/indapamide, fenofibrate, tiotropium, and inhaled fluticasone/salmeterol. The pharmacist also identified issues of fatigue, easy bruising and hyperpigmentation marks on forearms.

Interventions, Case Progress and Outcomes Several medication-related issues were identified, including a drug-drug interaction between fluticasone and darunavir/cobicistat (CYP-3A4 inhibitors), causing suspected iatrogenic Cushing’s Syndrome. Initial investigations required morning cortisol levels, however the existence of some unique issues and challenges.

Case Progress The pharmacist suggested simplification of the patient's abacavir and lamivudine doses to Kivexa. The pharmacist also determined the preferred third drug to be dolutegravir (DTG), which would require formulations not available in Australia.

Outcomes The pharmacist contacted ViiV Healthcare. This was the first request for these DTG products in Australia, which following a significant approval process were obtained for the child.

Conclusion This case involved multiple stakeholders from different locations working together collaboratively in order to achieve the best outcome for the patient. The child is now taking a lower pill burden regimen with reduced toxicity profile. Hopefully this case has paved the way for other children in Australia to be able to access DTG in the future.

Three months post-discharge, his HIV remained well controlled, HbA1c was 7.2%, blood pressure was at target, and oral cortisone being weaned under endocrinologist review.

Conclusion This case demonstrates that specialist pharmacist review in GP clinics can improve patient outcomes and prevent long-term serious sequelae.

THE ROLE OF THE PHARMACIST IN THE MANAGEMENT OF A CHILD LIVING WITH HIV INFECTION

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Objective In regional areas the management of children living with HIV infection often falls to local adult services. Antiretroviral treatment options in this population are often limited due to the existence of some unique issues and challenges.

Clinical Features This case report involves an 8-year-old African child living with HIV infection, who arrived in Australia as a refugee in 2016. The child was taking a complex multiple pill antiretroviral regimen which was resulting in adherence and toxicity issues.

Interventions Pharmacist advice was sought to determine if the child's regimen could be simplified. This involved an extensive review to consider correct medication doses, paediatric guideline recommendations, and consideration of alternative regimens.

Case Progress The pharmacist suggested simplification of the patient's abacavir and lamivudine doses to Kivexa. The pharmacist also determined the preferred third drug to be dolutegravir (DTG), which would require formulations not available in Australia.

Outcomes The pharmacist contacted ViiV Healthcare. This was the first request for these DTG products in Australia, which following a significant approval process were obtained for the child.

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Conclusion This case demonstrates that specialist pharmacist review in GP clinics can improve patient outcomes and prevent long-term serious sequelae.
Interventions, Case progress and Outcomes The patient was stabilised and discharged to a nursing home. The health informatics team (HIT) consisting of medical, nursing and pharmacy reviewed the incident, identifying that the prescribed dose did not import into the discharge referral letter correctly. With no immediate resolution available, the HIT team coordinated process changes to include administration record printouts from the eMM system with the discharge referral letter during transfers. Pharmacy representatives alongside application specialists created an alert which notified users when a dose was not imported correctly during discharge reconciliation. This alert has since been adopted at other eMM sites.

Conclusion Medication reconciliation remains pivotal during transfers of care as issues with eMM can occur. When issues identified are not easily remedied, prompt multidisciplinary collaboration is necessary to prevent similar future events.
CLOZAPINE WITHDRAWAL IN THE NEONATE

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Objective In refractory schizophrenia, continuation of clozapine therapy during pregnancy is usually necessary despite limited information about subsequent effects on the neonate. Here we report a case of maternal clozapine use during pregnancy and management of subsequent withdrawal in the neonate.

Clinical Features A 38-year-old woman with schizophrenia was prescribed clozapine 200mg daily throughout pregnancy, in addition to inhaled salmeterol/fluticasone for asthma, rabeprazole for reflux, and insulin for gestational diabetes.

Interventions, Case Progress and Outcomes A 3066g female infant was delivered via caesarean section at 41 weeks gestation with no obvious congenital anomalies. She was not breastfed due to the risk of adverse effects from clozapine transfer via breastfeeding. Lethargy, hypotonia, and feed intolerance developed during the first 12 hours of life, followed by bradycardic episodes and high pitched crying over the next 5 days. Brain imaging, echocardiogram, blood analysis and cultures were unremarkable. Following pharmacist suggestion, a clozapine level was taken on day 7, which was 28ng/mL. The infant was subsequently diagnosed with clozapine withdrawal and phenobarbitone 5mg/kg daily was commenced. Oral intake and neurological signs then improved sufficiently for discharge on day 14. After review on day 26, the phenobarbitone dose was halved with a plan to cease after two weeks.

Conclusion This case demonstrates the need for close monitoring for neonatal withdrawal symptoms in the first 2 weeks of life after in utero exposure to clozapine. Phenobarbitone can be an effective treatment for neonatal clozapine withdrawal and may minimize hospital stay.

WHEN THINGS ARE NOT WHAT THEY SEEM: A CASE HIGHLIGHTING AN IMMUNOLOGICAL CAUSE OF PSYCHOSIS

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Objective To report the use of immunotherapy in the management of psychosis.

Clinical Features An 18-year-old female was admitted to the mental health unit of a large metropolitan teaching hospital with paranoia, psychosis and suicidal ideation. Background medical history included Class V lupus nephritis diagnosed 1 year prior, managed with immunosuppressants which included tacrolimus and mycophenolate, and a depressive and manic episode earlier in the year.

Interventions, Case Progress and Outcomes Despite treatment with antipsychotics, she continued to experience ongoing paranoia and auditory hallucinations during the admission. A single photon emission computed tomography scan suggested a vascular cause and a diagnosis of organic psychosis secondary to cerebral lupus was made. After collaboration with the medical and pharmacy teams, a decision was made to trial methylprednisolone 750 mg intravenously daily for 3 doses, together with 2 doses of rituximab 1 g intravenously 2 weeks apart.

Minimal improvement was observed, and therefore a further 3 doses of methylprednisolone were given. In addition, 6 cycles of cyclophosphamide were planned. Improvement of symptoms was seen after the fourth cycle of cyclophosphamide, and discharge planning commenced soon after.

The pharmacist provided ongoing education to the patient, family and clinical staff as these medications are not regularly prescribed and administered in the mental health setting.

Conclusion This case highlights the importance of multidisciplinary care in the management of psychosis secondary to immunological diseases, and emphasises the importance of exploring the true nature and background of the presenting symptoms prior to managing an acute psychosis.

FALSE POSITIVES WITH FENOFOBRATE: AN ISSUE FOR MENTAL HEALTH PATIENTS

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Objective To report false positive amphetamine results from fenofibrate in mental health patients.

Clinical Features Atypical antipsychotic medications often cause dyslipidaemia. Fenofibrate is frequently prescribed for mental health patients. Illicit drug use is also common behaviour. Urine drug screenings (UDS) are taken on admission and during the inpatient stay after unsupervised leave periods outside the ward. Inpatients prescribed fenofibrate on the acute mental health ward were reviewed. A retrospective analysis investigated the number of UDS tests requested during admission, number of false positive results and corresponding fenofibrate dose.

Interventions, Case Progress and Outcomes Eleven mental health patients on fenofibrate were identified using dispensing records over a six-month period. Nine patients were prescribed 145mg daily, two patients were prescribed 48mg daily. Patients on the lower dose never tested positive for amphetamines. One patient was excluded as UDS was not undertaken during their admission. Four patients tested positive for amphetamines on more occasions than testing negative. Pharmacy consultation with Pathology, Social Work and the Medical Team raised suspicions of UDS false positive results. False positive results were confirmed at
least once in all patients by re-testing with mass spectrometry. Literature reports cite false positives with fenofibrate are a worldwide issue, yet not widely acknowledged in practice. A dose-related metabolite of fenofibrate is thought to be structurally similar to amphetamines. The result also depends on hydration level prior to testing.

**Conclusion** Patients prescribed fenofibrate with a positive UDS for amphetamines should have specific assays undertaken to avoid erroneous misinterpretation of results.
INTRAVENOUS L-ARGININE INFUSION FOR THE MANAGEMENT OF ACUTE METABOLIC STROKE SECONDARY TO MELAS

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Objective Mitochondrial disease is a rare genetic disease with no cure. One of the most common forms of mitochondrial disease is MELAS (mitochondrial encephalopathy, lactic acidosis and stroke-like episodes), a progressive neurodegenerative disorder resulting in stroke and dementia. This case describes the emerging use of L-arginine infusions to minimise the severity of stroke-like symptoms, in patients with MELAS.

Clinical Features A 57-year-old man presents to the emergency department with new receptive dysphagia. His past medical history includes MELAS syndrome and previous ischaemic stroke with seizures. His regular medications are aspirin, atorvastatin, perindopril, and levetiracetam. Following a computed tomography scan of the brain, the patient was diagnosed with metabolic stroke secondary to MELAS syndrome.

Interventions, Case Progress and Outcomes The patient was prescribed L-arginine infusion, however given the infrequency the infusion is prescribed, limited information for dosage and administration was available. Thorough review of available case reports were interrogated by the pharmacist and a dose of 500mg/kg intravenously (IV) daily for 3 days was recommended. After symptom improvement, the patient was discharged home three days later on oral L-arginine powder, CoQ10 daily, and riboflavin daily with no changes to his regular medications.

Conclusion Pharmacists play an essential role in the safe and timely supply of medications, and advising on appropriate dosages and administration. Although not widely used, there is emerging evidence L-arginine infusions can minimise the severity of stroke-like symptoms, improve the dynamics of microcirculation, and reduce tissue damage from ischemia in patients with MELAS.

WARFARIN-INDUCED CALCIPHYLAXIS: WHAT OTHER CHOICE DO WE HAVE?

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Objectives

To present a case report illustrating the limitation of current oral anticoagulation treatment options for patients with Chronic Kidney Disease (CKD).

Clinical Features A 68-year-old male developed painful, irregular-shaped, deep necrotic lesions on bilateral lower extremities while a rehabilitation hospital inpatient. Significant medical history included: type II diabetes mellitus, peripheral neuropathy, diabetic nephropathy, non-dialysis end-stage renal disease (ESRD), warfarin-treated atrial fibrillation (CHA2DS2-VASc=6) and stroke (2017).

The patient had a raised white cell count (15.5x10^9/L) and C Reactive Protein (132mmol/L) with normal corrected calcium (2.53mmol/L) and phosphate (1.03mmol/L). Calciphylaxis, a rare small-vessel disease resulting in cutaneous ischaemic necrosis, was diagnosed following two right calf 6mm deep punch-biopsies, and lower limb x-rays.

Interventions, Case Progress and Outcomes The patient was transferred to a quaternary referral hospital for wound care, dialysis and thrice-weekly intravenous sodium thiosulfate (25g). Within the multidisciplinary team the pharmacist provided medicines information regarding drug choice and dose, medicines supply via the Special Access Scheme, and monitoring of administration and outcomes. The calciphylaxis could not be solely attributed to either the warfarin or ESRD, so anticoagulation was changed to intravenous unfractionated heparin administered with Haemodialysis. The calciphylaxis wounds then began to heal.

Conclusion Currently, the only suitable oral anticoagulant for non-dialysed CKD patients is warfarin. Anticoagulant therapies for patients with calciphylaxis and CKD, are limited to parenteral agents, highlighting the need for alternate oral anticoagulant therapies with improved risk profiles for patients with renal impairment.

COMBINATION THERAPY FOR MASSIVE DABIGATRAN TOXICITY IN SEVERE RENAL IMPAIRMENT – ARE WE GIVING ENOUGH?

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Objective

Demonstrate the successful reversal of massive dabigatran toxicity using combination of daily haemodialysis and three repeated doses of 5g idarucizumab in acute kidney injury (AKI).

Clinical Features A 71-year-old man presented with acute abdominal pain and melena. He recently suffered a right middle cerebral artery stroke on background of atrial fibrillation and commenced dabigatran 150mg twice a day. Investigations on presentation showed stage 3 AKI, anaemia and coagulopathy, creatinine 1414umol/L, eGFR <5mL/min/1.73m2 (baseline creatinine 61 umol/L, eGFR >90mL/min/1.73m2), haemoglobin 78g/L and INR 8.7. 5g idarucizumab was administered for suspected dabigatran toxicity.

Case Progress and Outcome 18 hours post initial reversal, significant rebound coagulopathy was observed (APTT 89.7s and thrombin time >60s). Prior to this case, limited cases identified multiple doses of idarucizumab in AKI patients. After discussion with treating team and
clinical pharmacist, second dose of 5g idarucizumab was administered and daily heparin-free haemodialysis was initiated to facilitate drug removal. On day 2 dabigatran plasma concentration was higher than quantifiable level >500ng/mL. Third dose of idarucizumab was administered. Rebound phenomenon was evident from daily pre- and post-dialysis dabigatran concentrations. All investigations on day 14 showed complete removal of dabigatran and neutralization of its effect. Patient was discharged to continue stroke rehabilitation, with anticoagulation changed to warfarin.

**Conclusion** This case report proposes that monotherapy and current recommendation of single 5g idarucizumab may not produce complete and sustained reversal of dabigatran in severe renal impairment. Further investigation is required in non-clinical trial patient cohorts to provide guidance for real-life presentations.
A CASE OF TACROLIMUS-INDUCED POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME

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Objective This case demonstrates posterior reversible encephalopathy syndrome (PRES) as a rare neurotoxic adverse effect of tacrolimus.

Clinical Features A 49-year-old lady presented with reduced consciousness and upper limb jerking on background of kidney transplantation three weeks prior to admission.

Her past medical history included hypothyroidism, anxiety/depression, restless legs syndrome and history of opioid misuse. Medications on admission included tacrolimus 6mg twice daily, mycophenolate 1g twice daily, prednisolone 20mg daily, oxycodone 2.5mg four times daily as required, thyroxine 75microg daily and escitalopram 20mg daily.

Following failure of a naloxone trial, she was admitted to intensive care and loaded with phenytoin as seizure prophylaxis. Initial brain imaging, lumbar puncture and seizure study showed structural changes suggestive of PRES that was proposed to be secondary to tacrolimus.

Interventions, Case Progress and Outcomes Tacrolimus was ceased and sirolimus was commenced as an alternative immunosuppressant as it has not been associated with PRES. Due to the potential to augment sirolimus clearance, phenytoin was ceased following multidisciplinary review by the pharmacist and neurologist. Sirolimus levels were monitored regularly and the dose up-titrated to therapeutic level.

As hypertension can exacerbate PRES, blood pressure control was tightly monitored and multiple antihypertensives (perindopril, amlodipine and prazosin) were utilised to provide adequate readings.

The patient fully recovered and was discharged with thrice-weekly outpatient follow up.

Conclusion PRES is a rarely reported adverse effect associated with a number of medications, including tacrolimus. Drug-induced PRES should be considered in transplant patients using tacrolimus who present with altered consciousness, headache and seizures.

IT'S TIME TO RECONSIDER THE ROUTE: SUCCESSFUL TREATMENT OF REFRACTORY PROCTITIS WITH TACROLIMUS ENEMAS

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Objective To present a case of refractory ulcerative proctitis successfully treated with extemporaneously compounded tacrolimus enemas.

Clinical Features A 39-year-old male diagnosed with refractory ulcerative proctitis twelve years ago presented with a two week history of over twenty loose bowel actions per day. Previous flares had been treated with multiple agents, including oral tacrolimus, which was ceased due to intractable itch.

Intervention, Case Progress and Outcomes This presentation was initially treated with intravenous hydrocortisone with limited clinical improvement. Discussion between the gastroenterologist, clinical pharmacist and the patient resulted in a trial of topical tacrolimus which was compounded by the hospital pharmacy.

Tacrolimus has previously been shown to have excellent local absorption with limited systemic effects when administered rectally. While there is some evidence for the use of rectal tacrolimus therapy in children, there is little evidence in adult patients. Tacrolimus enemas (3mg/60mL) were prepared for daily administration. This was well tolerated by the patient with no signs of itch. After five days of therapy the number of bowel actions had reduced to six per day and the patient was discharged.

The pharmacist educated the patient on how to prepare the enemas at home. The patient continued on tacrolimus enemas after discharge and has remained in remission with no adverse effects for the last three months.

Conclusion This case highlights the benefits of tacrolimus enemas in the management of refractory ulcerative proctitis. The enemas can be prepared by patients, furthering their role in the outpatient setting.

SUB-THERAPEUTIC TACROLIMUS LEVELS FROM THE CESSATION OF PRISTINAMYCIN IN A KIDNEY TRANSPLANT RECIPIENT

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Objective To highlight a clinically significant drug interaction between tacrolimus and pristinamycin.

Clinical Features We report the case of a 56-year-old female with a renal transplant who presented with an unexpected sub-therapeutic level of tacrolimus (undetectable; less than 2.0 microgram/L). Her previous levels have been otherwise stable and her serum creatinine increased from 240 to 282 micromol/L during this time. The transplant was performed 10 months ago from a deceased donor.

Interventions, Case Progress and Outcomes The nephrologists initially surmised the reasons for the sub-therapeutic levels of tacrolimus were non-compliance or a pharmacy dispensing error. However, a pharmacist investigation found four weeks prior, the patient had ceased pristinamycin under the direction of an infectious diseases physician.
Pristinamycin is theorised to be an inhibitor of both P-glycoprotein and cytochrome P450-3A4. Since tacrolimus is a substrate of both, such a drug-drug interaction could lead to a reduction of tacrolimus levels when pristinamycin was ceased. However it is not well documented with only a few case reports existing so clinician awareness is poor.

The pharmacist concluded that this little known drug-drug interaction between pristinamycin and tacrolimus may have been a better explanation for her undetectable tacrolimus level. Based on the pharmacist’s theory, the dose of tacrolimus was increased from 0.5mg BD to 2mg BD (300% increase) and a therapeutic level was re-established one week later (4.1 microgram/L).

**Conclusion** This case report demonstrated that the interaction between tacrolimus and pristinamycin could lead to sub-therapeutic tacrolimus levels and risk kidney transplant rejection.
DOES ACCIDENTAL DOSE-DENSE EPCLUSA® MAKE SENSE?

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Objective To present a case of Epclusa® (Sofosbuvir/Velpatasvir) overdose five times greater than documented in the product information.

Clinical Features Our patient is a 28-year-old male with a new diagnosis of non-cirrhotic hepatitis C (viral load of 3280 IU/mL). He has untreated schizophrenia and injects illicit substances.

Interventions, Case Progress and Outcomes Our patient commenced a twelve-week course of Epclusa® on 3/8/17 and was dispensed 28 tablets to take home.

He presented to the Emergency Department (ED) on 28/8/17 requesting further supply. The second month of treatment was dispensed and he was counselled again on appropriate use.

The patient represented to ED two days later requesting further supply. The pharmacist established that he had consumed all twenty-eight tablets in the previous two days.

The pharmacist discussed the case with a toxicologist and the product sponsor. Although the patient appeared well, he was admitted for monitoring.

Epclusa® can cause pancytopenia however his blood results were normal. The patient denied any symptoms of toxicity and his echocardiogram was unremarkable. He remained well throughout his admission and was discharged home on the 8/9/17.

The patient's hepatitis C viral load measured on 31/08/17 (28 days after commencing treatment), was found to be <15 IU/mL. This result demonstrated that he had cleared the Hepatitis C virus and in consultation with his treating gastroenterologist ongoing treatment with Epclusa® was ceased.

Conclusion Our case illustrates the largest known reported overdose of Epclusa®. The overdose was fortunately well tolerated and curative.

INFLIXIMAB LEVELS: DIRECTING THERAPY IN ASYMPTOMATIC CROHN’S DISEASE

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Objective To illustrate a case where infliximab trough levels were used to direct treatment in an asymptomatic Crohn's disease patient.

Clinical Features Our patient is a 47-year-old male with extensive enterocutaneous fistulising ileocolonic Crohn's disease. First diagnosed in 1995, he has been treated with azathioprine since diagnosis and undergone multiple surgeries including resections. He is a smoker with a history of depression.

Intervention, Case Progress and Outcomes The patient presented with a small bowel obstruction and malnutrition in 2013. Infliximab was commenced at 5mg/kg eight-weekly.

In May 2015 the patient was largely asymptomatic yet his trough infliximab drug level was ≤0.1 microg/mL (sub-therapeutic), therefore his infliximab dosing frequency was increased to six-weekly.

Retesting of the infliximab level in mid-2016 showed therapeutic levels of 4.7 microg/mL and 4.25 microg/mL. The patient remained asymptomatic and infliximab continued six-weekly.

An MRI in June 2017 showed an ileocolic anastomotic stricture and a splenic flexure stricture, yet the patient remains symptom free and was gaining weight.

In January 2018 biochemical evidence of disease activity (elevated C-reactive protein and moderately low albumin) were detected. Infliximab levels were repeated and returned sub-therapeutic (≤0.3 microg/mL). Antibodies to infliximab were tested for but not detected. The patient remained symptom free. Given the extensive and severe nature of his disease and the observed low infliximab level, the decision was made to reload the infliximab and increase his dosing frequency to four-weekly.

Conclusion Monitoring infliximab levels has allowed optimisation of Crohn's disease treatment in an asymptomatic patient.

INFANT NEUTROPENIA SECONDARY TO MATERNAL INFlixIMAB

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Objective To describe a case of neutropenia in newborn twins resulting from in utero exposure to infliximab, successfully treated with filgrastim.

Clinical Features Identical boy twins were born at a metropolitan hospital via caesarean at 33 weeks due to maternal pre-eclampsia. FBC revealed twin 1 was neutropenic on day one (neutrophils =1.31). Neutrophils declined to zero for both twins on days 10 (twin 2) and 24 (twin 1).

The 42-year-old mother had a history of Crohn's disease. Usual medications included mesalazine, prednisolone, folate and infliximab 500mg every 8 weeks. Multiple courses of prednisolone and five infliximab doses for Crohn's management were administered during pregnancy. Guidelines recommend avoiding infliximab in third trimester to reduce placental transfer risk, however, an infliximab dose was administered during week 31.

Interventions Twins were admitted to special care nursery. Differential diagnoses included alloimmune, autoimmune and congenital neutropenia. Maternal and paternal blood tests showed no antibodies. Parents had no previous neutropenia history.

Subcutaneous filgrastim 300 microg/kg daily was started. Dose frequency was dependent on neutrophil counts.
Although neutrophils were maintained above $1 \times 10^9 / L$ to reduce infection risk, both twins received treatment for non-life-threatening sepsis in the neonatal period. Filgrastim was prepared by pharmacy. Twin 1 received 11 doses and twin 2 required five doses over an eight-week period. No adverse effects were reported.

Impression was neutropenia secondary to in utero infliximab exposure as neutropenia resolved within eight weeks.

**Conclusion** Neutropenia in newborn twins secondary to in utero infliximab exposure was safely and successfully treated with filgrastim.
SHAKING UP THE PERI-OPERATIVE MANAGEMENT OF PARKINSON’S DISEASE PATIENTS

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Objective To highlight morbidity related to delays in continuing Parkinson’s disease (PD) medications at transition of care. This case describes system failures in recognising PD patients and following recommendations of internal perioperative medication management guidelines.

Clinical Features A 70-year-old male nursing home patient with advanced PD and dementia presented to emergency at 1600 with fevers and lethargy, later diagnosed as sepsis likely due to ascending cholangitis with an associated hypoactive delirium. He was declared nil by mouth (NBM) for emergency surgery and did not receive any Parkinson’s medications. A rapid response was called at 2300 for decreased responsiveness and rotigotine patches were applied.

Interventions, Case Progress and Outcomes The patient continued to deteriorate due to inadequate dopamine levels. A nasogastric tube was inserted on day 3 and, on advice from pharmacy, levodopa/benserazide was administered. On day 8, a decision was made to palliate and he subsequently passed away.

In response, a multidisciplinary team conducted a root cause analysis highlighting a lack of system redundancies (particularly after-hours pharmacy services) and readily available information for clinical teams. An eMR alert for PD patients and a novel, quick reference guide on the peri-operative management of PD patients was created and included in the emergency department manual.

Conclusion A failure to respond to the critical timely management of a NBM PD patient likely contributed to this potentially preventable mortality. Of significant importance in this population is an initial swallowing assessment, adequate dopamine replacement, cessation of anticholinergics and relief of constipation, pain, agitation and delirium.

ARIPIPRAZOLE TOXICITY: FROM HYPOALBUMINAEMIA TO HYPOTHERMIA

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Objective To report a case of aripiprazole toxicity potentiated by hypoalbuminaemia.

Clinical Features A 43-year-old Caucasian male presented with a three day history of lethargy, agitation, behavioural changes, diarrhoea, hypothermia, and hypotension on a background of recent staphylococcal bacteremia. His past medical history included an intellectual disability and developmental delay, Cerebral Palsy and Epilepsy. His medications on admission included aripiprazole, carbamazepine, escitalopram, melatonin, diazepam, propranolol, clonidine, and dioxacillin.

Interventions, Case Progress and Outcomes A provisional diagnosis of Clostridium Difficile enteritis was made and oral metronidazole was commenced. However the patient continued to deteriorate clinically, with worsening hypotension and hypothermia. A secondary diagnosis of “cold sepsis” was made, and therapy was escalated to intravenous antibiotics. Routine investigations and initial laboratory results were unremarkable, with the only notable derangements being a slightly elevated C-reactive protein and significant hypoalbuminaemia.

Medication reconciliation performed by the ward pharmacist revealed a recent dose increase in aripiprazole, which is highly protein bound. Therefore, in the presence of concomitant hypoalbuminaemia, a diagnosis of aripiprazole toxicity was suggested by the clinical pharmacist.

Aripiprazole was ceased indefinitely and the patient made a full recovery.

Conclusion This case emphasises the importance of obtaining a complete medication history and considering the clinical and physiological status of the patient when reviewing medications. This case also highlights that proactive ward-based pharmacists are an integral member of a clinical team, who can detect unusual adverse drug reactions and improve patient outcomes.

ORTHOSTATIC HYPOTENSION: A COMMON SYMPTOM WITH A CHALLENGING DIAGNOSIS

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Objective Orthostatic hypotension is a symptom frequently seen in inpatients. There are a large number of possible causes which require investigation, including medication side effects, thus it is an area where hospital pharmacists are very much involved. Medical officers will frequently use medications to treat orthostatic hypotension such as fludrocortisone and midodrine, further involving pharmacy in the management. In this case, pharmacy were specifically consulted by the medical team to suggest alternative medications for the treatment of a patient, and suggestions included caffeine, pseudoephedrine, erythropoietin, droxidopa and octreotide.

Clinical Features Patient IE, 61-year-old male presented with ongoing symptoms of postural hypotension and episodes of diarrhoea. His postural hypotension was on admission being treated with midodrine and fludrocortisone.
Interventions, Case Progress and Outcomes Patient was an inpatient for four days, and increasing doses of fludrocortisone and midodrine were being used to no effect. The medical team then contacted pharmacy for suggestions as to further medications that may be of benefit. Caffeine, pseudoephedrine, erythropoietin, droxidopa and octreotide were suggested as medications with positive recommendations in the literature. Due to the patient’s diarrhoea, octreotide was selected and commenced at a dose of 50mcg tds. This increased baseline blood pressure and reduced diarrhoea and the patient was discharged. Gastroscopy conducted as an outpatient provided a diagnosis of amyloidosis which explained his presenting symptoms.

Conclusion The diagnosis of amyloidosis helps to explain this patient’s presenting symptoms of hypotension and diarrhoea, and the choice of octreotide as treatment was supported by the international literature.
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VALUING PATIENTS’ TIME

Professor Brian Dolan

Director, Health Service 360, Honorary Professor of Leadership in Healthcare, University of Salford, Manchester UK

In this keynote address, Professor Brian Dolan will discuss why patient time is the most important currency in health and social care. Drawing on a new model of change, co-created with Lynda Holt, CEO Health Service 360, called TODAY (Time, Ownership, Diagnostics, Action and You). This keynote address will examine why patient time matters and how two global social movements called #last1000days and #endPJparalysis, the latter of which encourages patients to get up, dressed and moving while hospital inpatients, emerged from this focus. It will also consider the vital role pharmacists have to play in engaging the public in a seemingly counter-intuitive conversation that bringing clothes into hospital, whether as a patient or a relative, can get patients home sooner and safer.
RESIDENCY: “TO RESIDENCY AND BEYOND … ”

Dan Guidone1

1The Society of Hospital Pharmacists of Australia, Vic.

As the first cohort of foundation residents completes their program, its time to reflect on the first 2 years of the program. What did we do well? What can we do better? What has been the impact for residents and patients? How do we measure our success?

The Foundation Residency program was conceived as a program for all early career and new to hospital pharmacists. It aims to provide a predictable, consistent and solid foundation for these practitioners to build their careers from. What steps need to be taken to fully realise its vision and potential?

Advanced training residencies are the next phase of the SHPA's whole-of-workforce strategy. What could these look like and who could take part? We will discuss what the vision for these programs are, where they fit within the workforce strategy, and what gaps in existing training the SHPA is aiming to fill by introducing these programs.

RBWH EXPERIENCE OF PORTFOLIO EVALUATION AND FEEDBACK FROM FIRST COHORT OF RESIDENTS

Danielle Silvestro1

1Royal Brisbane and Women's Hospital, Qld

The end of 2018 will see the graduation of the first cohort of SHPA resident pharmacists. We recognise the importance of taking the time to reflect on the journey of the residents over the past two years. This presentation aims to share how the SHPA residency program at the RBWH has shaped the residents as early career pharmacists. This will include an overview of the early perceptions of the residency program and how this translated to reality. It will also touch on the challenges of residency, but ultimately how it has benefited the training and progression of the resident pharmacists. This will give us an insight into the milestones which our residents are achieving; resulting in the development of portfolios that are the foundation of their careers. Consequently, inspiring early career pharmacists to be a part of future residency cohorts. Finally, we will also reflect on how the residency experience can be improved for these future residents and acknowledge the importance of continual growth and development of the residency program.

ADVANCING PRACTICE: WHEN IS THE RIGHT TIME FOR ME?

Lisa Nissen1, Debra Rowett PSM2, Sally Marotti3

1Queensland University of Technology, Qld, 2University of South Australia, SA, 3SA Pharmacy, SA

Ever feel like your life is like a bit of a roller coaster? Or more like a game of baseball? Your career and personal life can take many paths, and every twist and bend offers us new opportunities to learn, each holding pattern offering us opportunities to consolidate. All the time we are advancing our knowledge, skills and relationships.

Advancing practice is all about our journey to consolidate our knowledge, increasing the impact we have on practice, and how we influence not just our patients but the practice of our interdisciplinary team. We will take the careers of three advanced practice pharmacists and explore the common key elements that have led to them advancing their own practice; scholarship, research, leadership and mentorship. Everyone has their own journey, but we hope by the end of this session you will be clearer in your mind about Advanced Practice and when it is the right time for you.

WHAT IF YOUR TIME WAS NOW?

Simone Ryan1

1One Life. Live It, NSW

Dr Simone Ryan was born and bred in Gunnedah and represented Australia in basketball. When working in a world-leading hospital in cardiac surgery, Simone realised the pressures of the corporate landscape – mostly via her patients; everyday workers.

When her own health started to suffer due to excessive work demands, she left her job in catastrophic circumstances and immediately started her own business; aptly calling it “One Life. Live It.” This is a motto she 100% lives by.

Simone went on to realise that healthcare being provided within companies was not particularly evidence-based and has since pioneered a pathway for all to follow.

This is her compelling story and call to action.
TIMING AND CONTROL: MANAGING GESTATIONAL DIABETES

Dr Karin Lust¹

¹Royal Brisbane and Women’s Hospital, University of Queensland, Qld

Gestational diabetes mellitus (GDM) is occurring with increasing frequency and now affects approximately 10% of pregnancies in Australia. The increasing rate is due to advanced maternal age, the changing ethnicity of Australia’s population, increased maternal weight in pregnancy and changes to the diagnostic threshold for GDM. GDM is associated with short and long term affects for both the mother and baby which are a result of elevated maternal blood glucose levels. Effects in pregnancy include an increased rate of maternal hypertensive disorders of pregnancy, premature delivery, intervention at delivery, fetal macrosomia and shoulder dystocia and a range of other fetal complications. Long term complications include an increased risk of type 2 diabetes for the mother and for the infant obesity, adverse effects on lipid and glucose metabolism and hypertension.

Evidence has confirmed that the diagnosis and treatment of GDM is associated with reductions in adverse maternal and fetal outcomes. Management consists of dietary therapy, exercise, home blood glucose monitoring and pharmacological therapy to normalise maternal blood glucose levels. Pharmacological therapies to maintain euglycemia include insulin and oral hypoglycaemic agents. This presentation will include an overview of the current diagnostic criteria for GDM, the impacts of GDM as well as management and pharmacological therapies available to treat GDM to achieve maternal euglycemia with the aim of optimising maternal and fetal health in both the pregnancy and long term.

CLOSING THE GAP: TIME TO REFLECT ON THE LAST 10 YEARS AS A PROFESSION

Chris Braithwaite¹

¹Aboriginal Health Services NSW

This presentation will address Aboriginal and Torres Strait Islander Health from a primary health care perspective, with the appropriate links to the delivery of acute health care services. Target attainment and how Australia is currently tracking in regards to Closing the Gap, as well as barriers will be discussed. This will include analysis of the Prime Minister’s Closing the Gap Report 2018; as well as discussing institution racism and how this translates into practice and higher rates of discharge against medical advice and the potential reasons for this. In the context of diabetes management, social and cultural concepts will be the forefront of management discussions through a case study. The increased prevalence and reasons, impact of mental health, concept of self-determination and important other considerations including CVD and CKD. Finally, culturally appropriate resources and education material will be suggested for use with patients when discussing medication and disease related issues.

DIABETES MANAGEMENT IN THE ELDERLY: A TIME AND PLACE FOR EVERYTHING

Fiona Ellem¹

¹Griffith University, Qld

With our aging Australian population, both the incidence and prevalence of diabetes is increasing. Well established guidelines and targets exist for best-practice management of diabetes but these acknowledge a lack of evidence from the elderly population. This presentation will outline clinical quandaries in guideline-based care of elderly people with diabetes, and will consider the evidence, benefits and risks of newer medications.
**Time-critical Care**

1115–1245 | Mezzanine 3

**“THINK SEPSIS. TIME MATTERS”**

Ellen Burkett

1Princess Alexandra Hospital, Qld

Sepsis remains a significant cause of mortality globally. This presentation will review current evidence in relation to sepsis management, with particular emphasis on time-critical therapies. Sepsis quality improvement programs have emphasized time to antibiotics as the primary key performance indicator in sepsis management. This trend and the associated audit methodologies will be critically evaluated.

Finally, pharmacist roles in ED management of sepsis will be reviewed.

**“BUYING TIME”: EXPLORING THE EMERGENCE OF ECMO IN AUSTRALIA**

Melanie Kowalski

1Alfred Hospital, Vic.

Utilisation of extracorporeal membrane oxygenation (ECMO) to support cardiac and respiratory function of critically ill patients has expanded significantly over the past decades in Australia. Critical care pharmacists should now consider caring for ECMO patients as common place in larger intensive care units and it is essential for them to be leaders in a multidisciplinary team setting when discussing pharmacological considerations. This presentation aims to provide an introduction into pharmacokinetic and pharmacodynamic considerations for commonly used medications in ECMO including anticoagulation, sedation, analgesia and anti-infectives.

But be warned... if you are expecting a one size fits all answer for your ECMO medication management you are in for disappointment.

After this talk you will have the tools to understand the complex way ECMO and medications interact, which you can use in everyday clinical practice to optimise patient care. Building on this; your knowledge of drug properties cannot be used in isolation, this talk will combine pharmacokinetic and pharmacodynamic theories with the complexities of critical care, understanding the impact of organ systems and assessing the patient as a whole before providing your drug recommendations to your multidisciplinary team.

**“PREPARATION TIME”: IMPLICATIONS OF DRUG SHORTAGES AND PATIENT CARE**

John Skerritt

1Department of Health, ACT

Medicine shortages have become an increasing problem in recent years, with recent notable shortages including adrenaline auto-injectors, metronidazole infusion, glyceryl trinitrate tablets, clomifene, mupirocin ointment, metformin extended release tablets, carbimazole, ampicillin and amoxycillin injections and aciclovir ophthalmic ointment.

Some medicine sponsors failed to comply with the current scheme for voluntary reporting of shortage or discontinuations to the TGA. If TGA receives timely information about a shortage we can work with the sponsor to identify alternative sources of supply domestically and internationally, work with pharmacists and prescribers on best use of available supplies and identify clinical alternatives.

On September 11 2018, Federal Parliament passed legislation to require mandatory reporting of shortages of any prescription medicines and certain OTC medicines. A shortage is defined as existing if supply won’t meet, or is unlikely to meet, all patient demand at any time in the next six months. A “watch-list” of critical-impact prescription and non-prescription medicines has been developed. The law applies from 1 January 2019 and gives sponsors two working days to notify TGA about an expected shortage of a critical-impact medicine.

Medicines will be considered critical-impact where a shortage could lead to patient death or morbidity, if there are no current alternatives or if it is unlikely there will be enough substitutes to meet demand.

Sponsors will have 10 working days to report shortages of other medicines. Discontinuations of critical medicines must be reported 12 months ahead or as soon as practicable, or six months in advance for other medicines. Sponsors who fail to comply with the new laws may be named on the TGA website, and a range of civil penalties may apply to repeat non-compliant behaviours. While mandatory reporting will not stop medicine shortages, health professionals will be better prepared when they do occur.
TIME TRAVEL: TELEMEDICINE

Anthony Smith¹

¹The University of Queensland, Qld

The use of telehealth to support people living in remote areas is gaining much interest in the Australian health sector. In the right circumstances, telehealth can save people having to travel extensive distances to access specialist health services. This is especially important for people living in rural and remote areas of the country, and for people who have difficulty travelling away from home. Despite the obvious advantages of telehealth, its uptake in Australia has been rather slow and fragmented. In 2011, the Australian Government introduced funding for telehealth consultations through the Medical Benefits Scheme (MBS). This has helped stimulate growth in telehealth activity. Aside from MBS funding for medical services, there are a range of other important ingredients required for the successful implementation of telehealth. This presentation will take you on a journey which explores the way telehealth is being used for a broad range of services in different settings, including pharmacy. Critical steps in establishing these services will be discussed, as well as key research findings, challenges and lessons learnt.

TIME MACHINE: MACHINE LEARNING

Brent Richards¹

¹Gold Coast Hospital and Health Service, Qld

Artificial Intelligence (AI) is central to the fourth industrial revolution, a technology-led transformation happening at an unprecedented rate, markedly changing how we both live and work. It is already changing the clinical landscape, as aware practitioners are realising AI’s potential and future, and adjusting to accommodate these within their future practice. And with major technology companies already investing heavily, along with traditional vendors pivoting to benefit from the technology, the pace will continue to quicken. Healthcare also needs AI. As clinicians we are already increasingly challenged to effectively use all available data to improve patient outcomes, with both increasing publications and guidelines, and expanding clinical test and monitoring options. With new equipment also continuing to provide yet more data, we require constantly improving data tools and analysis, with AI the key ingredient.

A key capability of AI is the ability to detect patterns in data, including images. Although clinicians are remarkably good at this, the sheer data volumes mean we are starting to miss opportunities to improve. It’s therefore time for clinicians to engage with AI technologies, getting assistance with simpler tasks such as reading ECGs and Xrays, assisting patients with interactive chatbots, along with using predictions to help better inform possible interventions and complications. As well as helping improve overall patient care and outcomes, it will allow us more time to work directly with patients, facilitating increasingly safe and personalised care.

THE PATIENT’S TIME: MY HEALTH RECORD

Vicki Ibrahim¹

¹Australian Digital Health Agency, Qld

My Health Record System, a secure, legislated, patient-controlled, electronic summary of an individual’s key health information, increases the availability of digital information to support integrated, patient-centric healthcare models of the future. It allows, with patient consent, access to verifiable clinical information that is not readily available to the pharmacist, such as discharge summaries, shared health summaries (containing medical conditions, medications, allergies and vaccinations), specialist letters, and pathology reports as well as prescribing and dispensing information. Meaningful use of the My Health Record system by pharmacists has the potential to augment safety and quality features of the medicines management ecosystem, significantly reducing the burden of medication misadventure to the healthcare system.
THE LIGHT BULB MOMENTS... AND CAPTURING THEM

Tina Brock¹

¹Monash University, Vic.

The theory of ‘disruptive innovation’ has proved to be a powerful way of thinking about innovation-driven growth in health care. Many leaders of entrepreneurial companies have praised this as way of thinking differently about the future of our industries – both health care and training. In the technologies field, Google’s parent company is called Alphabet where each letter represents specific disruptive technologies (e.g., G is for Google). To create space for innovation in yourself and in the teams, it’s possible to follow a similar alphabetic model. This session will explain how to use concepts like Awesome, Burstiness, Communications, Distillation, Execution, and Failure to create space for themselves for innovative ideas. We will explore some real-life examples – positives and not-so-positives – of operationalising these strategies.

THE ART OF ACCESSING FUNDING – HOOK, PITCH, TIMING AND RESILIENCE

Tom Simpson¹

¹Tasmanian Health Service and University of Tasmania, Tas.

Writing a business case is the easy part – getting it funded is much harder.

There are many competing priorities for limited hospital budgets, and funding more doctors or nurses is always sexier than funding more pharmacy services. Yet investment in pharmacy can often produce greater dividends both to hospitals and patients – so how can we ensure that business cases for pharmacy services are well-positioned for success?

This presentation will explain some of the key steps for improving the chance of success for your business case, including:

- Understanding the ‘hook’ – is it innovation, managing risk, unmet need, or new sources of income?
- Get the pitch right – is it a project to grow pharmacy services, or is it a project to streamline care delivery?
- Manage the strategic and political environment – how can you lead your Executive on a journey where the natural end point is the approval of your business case?
- Making it stick – proving the benefits, and being worthy of further investment.

The presentation will draw on real-world experience in obtaining funding for several pharmacy-related initiatives to improve patient care in public hospitals.

PANEL DISCUSSION: THE GREATEST DEBATE OF ALL TIME: DOES A GOOD RESEARCHER MAKE A GOOD LEADER?

Michael Barras¹, Jeff Hughes², Tina Brock³, Peter Little AM⁴

¹Princess Alexandra Hospital, Qld, ²Curtin University, WA, ³Monash University, Vic., ⁴The University of Queensland, Qld

SHPA has introduced the National Translational Research Collaborative (NTRC) to build and foster research capacity and capability in our workforce. A key driver for the NTRC is a strong hospital-university partnership to facilitate high quality, collaborative research. An effective research culture relies on strong leaders who can set the research direction and continue to deliver results. However, does a good researcher make a good leader – and vice-versa?

The panel comprises three research leaders who will share their thoughts on this greatest debate. This will be a Q&A forum where your questions will be discussed and debated. We will aim to explore the commonality and differences between the attributes and personal qualities of strong leaders and researchers; and to investigate how skills learned in leadership roles and research positions may complement each other.
TIME TO INNOVATE

Melynda Flor¹
¹Royal Brisbane and Women's Hospital, Qld

Accuracy checking by pharmacy technicians is one of many possible advanced scope roles for Australian technicians. It involves a change from the current ‘final check’ of dispensed items by a pharmacist to a split check process whereby the pharmacist performs a clinical check on the order and the technician performs the final accuracy check (written order versus item). Upskilling Australian pharmacy technicians to perform accuracy checking has the capability to free up pharmacists for advanced clinical tasks and improve checking accuracy and efficiency. The United Kingdom, New Zealand, some USA states, and The Alfred Hospital in Melbourne Australia have implemented this service model.

The national implementation in Australia has been impeded due to the variation between state and territory laws and institutional indemnity arrangements and the lack of available training courses. To ensure implementation complexities were addressed in an appropriate way, a steering committee was consulted throughout the project. In addition to this the project team engaged stakeholders who could provide advice on the practicalities of implementation including legal, indemnity, and education aspects.

Mark Clifford¹
¹Westmead Hospital, NSW

In 2016 the NSW Branch expanded the number of Technician Observers on the branch. With the SHPA Technician Role Redesign Project underway and hospitals expanding technician roles it was agreed a Technician Subcommittee was required to support NSW technician members, provide CE events, and drive technician membership.

The format of the Technician Subcommittee was based on the already established Education Subcommittee. The Technician Subcommittee includes the 3 Technician Observers of the NSW Branch and 7 other sub-committee members (maximum 10 people). Expressions of interest were advertised to technician members two weeks prior to the Medicines Management 2016 Conference with applications closing two weeks after.

The first meeting was held in early 2017 with the subcommittee having 8 members in total. By 2018 all 10 positions were filled. Meetings are held bi-annually. Four CE events were held in both 2017 and 2018. Technician membership in NSW increased by 62% between 2017 (n = 16) and the first quarter of 2018 (n=26).

The SHPA NSW Branch Technician Subcommittee continues to build on its initial success and has proved invaluable as an education and networking resource for NSW technician members. Other branches are now looking to form their own technician subcommittees.

TIME TO TEACH AND TRAIN

Krystal Grzelak¹
¹Royal Darwin Hospital and Northern Territory Mental Health Service, NT

As the role of a pharmacy technician continues to evolve, the practice of effective communication between Pharmacy technicians and pharmacist must also evolve.

Now more than ever it is important to look at and implement regular protected time to give and receive feedback with technicians to help mentor individuals to become more independent, engaged and accountable for their roles.

It is equally as important to exercise and extend our skills on not only giving feedback but making sure we are open to receiving feedback. The art of giving and receiving feedback is not widely seen as a skill to improve on but it can be vital to maintain a healthy, well-functioning team.

In this presentation I will talk about how learning to give and receive feedback changed my practice and allowed me to be more responsible, accountable and enthusiastic about my work and work load.

Sarah Holster¹
¹Epic Pharmacy, Port Macquarie, NSW

The technician workforce in Australian hospital pharmacy has been under rapid evolution. Watching the paths that technicians have taken overseas, and those that technicians have taken within Australian has shown that the learning pathway is quite individual and also can lead in unusual, unexpected and deeply rewarding directions.

In this presentation the author will cover their own personal pathway, and give examples learning and training they have undertaken. The author will also indicate how they have encouraged their technician team to follow their own paths, and explain how they have motivated, empowered and supported their team to reach their goals.

Finally, the author will point out how time to teach and train at a hospital pharmacy can also be of tremendous benefit outside of the pharmacy space.

PANEL DISCUSSION: TIME TO LEAD

Sharon Goldsworthy¹, Rhiannon Braund², Tara Clayson Fisher³, Pippa Burchnall⁴, Bryan Walker⁵
¹The Queen Elizabeth Hospital, SA, ²University of Otago, NZ, ³Royal Adelaide Hospital, SA, ⁴Gold Coast University Hospital, Qld, ⁵Canberra Hospital and Health Services, ACT

In this presentation the author will cover their own personal pathway, and give examples learning and training they have undertaken. The author will also indicate how they have encouraged their technician team to follow their own paths, and explain how they have motivated, empowered and supported their team to reach their goals.

Finally, the author will point out how time to teach and train at a hospital pharmacy can also be of tremendous benefit outside of the pharmacy space.
Aim To develop an electronic screening tool to identify patients at high risk of opioid-related adverse drug events (ORADEs).

Methods A literature review was conducted to identify risk factors for patients experiencing ORADEs. Consultation occurred with key stakeholders including pharmacists, acute pain and drug and alcohol services. Using risk factors available via electronic medical record (eMR), a prototype electronic review tool was developed by the electronic medication management system (eMM) team and accompanied by pharmacist education.

Results Numerous risk factors were identified including increasing age, frailty, impaired kidney or liver function, current or recently ceased smoker, presence of obstructive sleep apnoea (OSA), acute respiratory illness or obesity. Recent surgery (within previous 24 hours), thoracic surgery, high dose opioid (>60 oral morphine milligram equivalence a day), new opioid order and use of hydromorphone or fentanyl were also identified. Concomitant medication factors included the use of central nervous system depressants, anxiolytics, antidepressants, anticonvulsants and antipsychotics.

A real time dynamic report was developed (clinical pharmacist worklist) that identified all patients on an opioid in specific clinical areas along with patients’ last 3 results of pain score, sedation score, respiration rate, eGFR, body mass index, recent naloxone administration and relevant concomitant medications. Other risk factors could not be obtained electronically and required manual screening. Education resources were developed to assist pharmacists with this.

Conclusion A prototype electronic screening tool was developed to identify patients at high risk for ORADEs. Some risk factors could be identified electronically, but some still required manual screening.

The introduction and evaluation of a pharmacist-developed multimedia patient educational tool on apixaban

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Aim To develop and introduce a multimedia patient educational tool on apixaban, and to evaluate its effectiveness as compared to traditional counselling methods.

Methods Literature shows that multimedia educational programmes offer several advantages in improving delivery of information and learning outcomes. A multimedia educational tool suitable for use as an adjunct to patient counselling on apixaban was developed. Its efficacy as compared to traditional counselling was evaluated in a pre- and post-intervention study.
Results An 8-minute rich patient educational video was developed in collaboration and consultation with a university-based learning and teaching team. The video consisted of informational and illustrational presentations, overlayed with clear narration on patient relative information on apixaban. The tool was presented to and appraised by a review panel prior to its use in the evaluation study. The review panel rated the video 9/10 on how informative it was, 8.5/10 on quality, 7/10 on content, 7.5/10 on duration, and 8/10 on applicability for its use in practice. The efficacy of the educational video, as compared to traditional counselling, was evaluated with the comparison of level of retention of anticoagulation knowledge both immediately after and four weeks after education, degree of patient satisfaction with the education received, and pharmacist’s time spent in the education session. Data collected were analysed in consultation with statistical expertise.

Conclusion This study provided the basis for future development and incorporation of multimedia educational programmes suitable for use by pharmacists and other healthcare professionals in the provision of patient care.

NOACS – IT’S TIME TO EXTENUATE PATIENT KNOWLEDGE GAPS!

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Background New oral anticoagulants (NOACs) are often perceived by clinicians as “easier” drugs to use than warfarin. We suspect a lack of quality patient education and knowledge of these medications.

Aim To investigate gaps in patients’ knowledge of their oral anticoagulants and compare differences in knowledge between patients taking warfarin and NOACs.

Methods A prospective cross-sectional survey was conducted in two tertiary hospitals by three international research students. Patients taking either warfarin or a NOAC were recruited. Patient knowledge was assessed using the Anticoagulation Knowledge Tool (AKT); (1) a tool that quantifies general anticoagulant and warfarin specific knowledge.

Results 151 patients completed the AKT; 54 taking warfarin and 97 a NOAC. The total mean (SD) percentage correct score on the AKT was 56.3% (15.4). For all patients, significant gaps in knowledge were present for side effects (n=58, 38%), concurrent NSAID use (n=62, 41%) and safety of missing a dose (n=55, 36%). Patients taking NOACs had a significantly lower mean percentage of correct answers compared to those taking warfarin for; side effects (30% vs 54% p=0.02); NSAID use (32% vs 57%, p=0.002); and missing a dose (29% vs 50%, p=0.01). For patients on warfarin, knowledge of current INR and dietary restrictions was limited.

Conclusion Patients taking NOACs had significantly less anticoagulant knowledge than warfarin users, in particular what to do with missed doses, interactions and side effects. We recommend NOAC education is individualised with an emphasis on mitigating knowledge gaps.

Electronic medical records accurately recorded allergens post-intervention for 80%, compared to 58% pre-intervention. Recording of details in discharge referrals remained constant at less than 80%.

**Conclusion** A district-wide anaphylaxis strategy has reduced, although not eliminated, use of second-line medications. This audit determined that algorithms and distribution of only recommended treatment improved adherence, however, the management, documentation and communication across transitions of care can be improved.
**C14 Collaboration**

**Plan to Ensure Effective Resource Collaboration**

**Aim**

To demonstrate the value added through the development and implementation of a procurement plan for pharmaceuticals.

**Methods**

A procurement plan, defining the decision processes and accountabilities involved in procurement of medicines at a tertiary metropolitan health service was implemented in 2017. The plan was developed by specialist pharmacists following analysis to identify opportunities for market engagement. A study was conducted to quantify the benefits derived from the plan across the 2017–18 financial year. The study identified the scope of procurement activities and the benefits for the health service.

**Results**

Two tenders, 13 Requests for Quotation and three direct negotiations were conducted in the 2017–18 financial year, in addition to major sourcing events conducted by the state-wide procurement organisation. Fifty medicines with 92 presentations were included in Invitations to Supply, delivering an estimated $3 million in cost reduction, or 3.1% of health service expenditure, with a further $1.88 million estimated to be saved across the 2018–19 financial year. These savings would have otherwise been forgone had opportunities for market engagement not been identified. Through proactive engagement by specialist pharmacists with the health service executive and Board, savings were able to be reinvested into meeting department budget efficiency and productivity targets, as well as contributing towards successful business cases for up to 28 EFT.

**Conclusion**

The development of a formal procurement plan has resulted in significant benefits for the health service. This work highlights the strategic benefits associated with the development of specialist business and economic management roles for hospital pharmacists.

**The Value of Cluster-sourcing and Collaboration in Delivering Benefits to Health Services and Patients**

**Aim**

To demonstrate the value added through pharmacist-led cluster-sourcing for pharmaceuticals in regional areas.

**Methods**

A retrospective study was conducted of the financial and non-financial benefits reported for a group of health services in a regional area through a cluster-sourcing event in collaboration with a state-wide procurement organisation. The study identified the scope of the pharmacist-led procurement activity, the current contract value, stakeholder engagement approach and the financial and non-financial benefits to health services involved.

**Results**

Three public health services in a regional area participated in the cluster-sourcing event in collaboration with a state-wide procurement organisation, the first approach of its kind for pharmaceuticals in the state. Fifty-two medicines were included as part of the event, with a total annual contract value of $2.46 million. The outcome achieved an estimated cost reduction of 5%, allowing the financial benefits to be reinvested into meeting department budget efficiency and delivering improved patient care. These benefits would have otherwise been forgone without the implementation of the innovative cluster-sourcing approach, with the relevant pharmaceuticals not previously endorsed for state-wide market engagement. This collaboration enabled the development of strong rapport between pharmacists and procurement specialists and minimised duplication of resourcing from multiple sourcing events. The demonstrated benefits from cluster-sourcing have been identified as an opportunity for expansion to other regional areas.

**Conclusion**

The leadership and collaboration between pharmacists and procurement specialists has facilitated cluster-sourcing for pharmaceuticals, enabling the delivery of both financial and non-financial benefits to health services and patients in regional areas.

**Establishing a Research Framework for Evaluating the Implementation of an Electronic Medication Management System**

**Objective**

To implement a research framework for evaluating an electronic medication management system (eMMS) as part of a larger electronic medical record (EMR) implementation in a large tertiary referral multi-hospital network.

**Methods**

Pharmacy Research Leadership collaborated with Pharmacy Clinical Informatics, Management, and Education leads to identify priority research themes. The department’s database of completed research was reviewed to identify previously conducted research projects that could provide quantitative or qualitative ‘pre-implementation’ datasets. Post-implementation evaluation will utilise robust pre-post or stepped-wedge research methodologies. A gaps-analysis identified research themes requiring further examination prior to EMR implementation, to be incorporated into projects being undertaken by Intern and Resident Pharmacists.

**Conclusion**

The leadership and collaboration between pharmacists and procurement specialists has facilitated cluster-sourcing for pharmaceuticals, enabling the delivery of both financial and non-financial benefits to health services and patients in regional areas.
Results A literature review, consultation with other health services, and the organisation’s EMR Benefits Realisation Committee confirmed priority research themes: (1) medication use and patient outcomes, particularly for EMR-integrated care plans; (2) clinical pharmacy practice and influence of EMR on direct patient-facing care; (3) prescribing and nursing practices influenced by eMMS; (4) medication safety. Forty-two recent projects were identified providing ‘pre-implementation’ datasets across themes: medication use (n=21), pharmacy practice (n=18), prescribing/nursing practice (n=1), and medication safety (n=2). Seven new projects were completed by Intern and Resident Pharmacists to provide pre-data for priority areas identified by gap-analysis prior to EMR implementation in October 2018.

Conclusion A research framework was established to complement a complex EMR implementation. Completed and new projects fulfilled identified priority research areas that will be re-examined post-implementation to evaluate influences of EMR on a range of practices and medication-related patient outcomes.

Collaboration

Collaboration between Healthcare and Industry to Improve the Safety of Neuromuscular Blocking Agents in Australia

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Background Neuromuscular Blocking Agents (NMBA) are high-risk medications administered in critical-care settings. The unintentional administration of a NMBA can result in permanent injury or death. Current Australian NMBA labelling and packaging does not clearly differentiate NMBA from other medications.

Aim To describe the collaboration initiated by pharmacists and anaesthetists between manufacturers, the Therapeutic Goods Administration (TGA) and peak Australian healthcare organisations to improve NMBA safety in Australia.

Methods In February 2015, the Victorian Therapeutics Advisory group (VicTAG) submitted ‘Time for change: proposed safety improvements to NMBA labelling and packaging in Australia’ to the TGA. The submission identified look-alike labelling and packaging as a contributor to Victorian NMBA incidents resulting in life-threatening patient harm. Eleven of 13 Australian NMBA products had no distinctive labelling and packaging. The initial TGA evaluation did not support changing NMBA labelling and packaging. A response was coordinated from Victorian and NSW TAGs, published authors, the Australian and New Zealand College of Anaesthetists’ and the Australian Commission on Quality and Safety in Healthcare.

Results In November 2017, the TGA initiated a roundtable discussion inviting NMBA manufacturers, pharmacists, anaesthetists and peak Australian healthcare organisations. The importance of distinctive labelling and packaging to decrease selection errors was emphasised. In July 2018, the TGA issued the regulation that standardising NMBA labelling and packaging with a colour-coded warning label will become mandatory from 2020.

Conclusion Hospital pharmacists and anaesthetists led a strategy resulting in a unique collaboration between the TGA, industry, and peak healthcare organisations, to improve NMBA safety in Australia.

IN Volving the Patient: Medication Safety Risk Reduction Strategies in an Australian Health Service

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Aim To implement multiple patient-centred strategies to reduce medication errors across a major metropolitan health service through optimising medication management pathway (MMP) to improve patient care and experience.

Methods Several workflow system redesign and patient-centred initiatives have been implemented through collaboration with key stakeholders to introduce pharmacist-driven strategies to improve medication safety across the health service.

Results Collaboration with multiple key members of the multidisciplinary health care teams has allowed this health care service to create new roles for pharmacists to enable them to be involved with the patient in all stages of the MMP to reduce medication errors. In preadmission clinics, medications errors were reduced from 96% to 9% (p<0.001); on admission, collaborating with patients through a novel admission pharmacist role resulted in reduction of errors rate from 0.43 to 0.05, p<0.05. Involving the patient at discharge and redesigning workflow processes to facilitate timely discharges has increased the number of prescriptions available for patients prior to the day of discharge from 32% to 59%, p<0.001 and reduced the number of errors in the discharge scripts by 37% (from 61% to 24%, p=0.0002). Collaboration with patients through pharmacists and clinicians’ provision of both verbal and written information during their hospital stay resulted in patients reporting positive satisfaction and experience with their admission, (OR= 5.189 95% CI (1.583–17.010), p<0.0001).
Conclusion Patients' collaboration at several stages of the MMP and redesigning several workflows have contributed to a statistically significant reduction in medication errors and patient satisfaction.
DEVELOPMENT OF A POLYPHARMACY ASSESSMENT TOOL TO IDENTIFY PATIENTS AT RISK OF ADVERSE EVENTS

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Aim To develop and validate a score-based polypharmacy tool to identify patients at risk of adverse events.

Methods A systematic review of existing polypharmacy tools and their validation against outcomes was undertaken. Expert doctors and pharmacists were then surveyed to identify their usage of existing validated tools in practice and important factors during polypharmacy assessment. These factors were subsequently tested using de-identified data from an outpatient multimorbidity clinic against the outcomes of hospitalisation and mortality, before combining them into a final formula for the polypharmacy tool.

Results The systematic review identified 42 polypharmacy tools, with 31.0% (n=13) validated against patient outcomes. Experts (n = 22) revealed low usage of existing validated tools and stated that whilst the number of medicines is important, factors such as drug-drug interactions, high risk medicines and drug class duplication are also important in polypharmacy assessment. Validation of the new tool using outpatient data (n=607, mean age 79.1 years) revealed that patients were taking a mean of 12.2 medicines. The prevalence of drug-drug interactions was 76.3% (n=463); most commonly angiotensin converting enzyme inhibitors with loop diuretics (n=120, 19.8%). Prevalence of high risk medicines was 58.6% (n=356), most commonly anticoagulants (n=163, 26.9%) and drug class duplication prevalence was 6.3% (n=38), most commonly topical steroids (n=10, 1.6%).

Conclusion The prevalence of drug-drug interactions and high risk medicines reflects the complexity of care for older multimorbid patients with polypharmacy. The polypharmacy tool may be useful in identifying patients at risk of adverse events requiring further review and close monitoring.

PHARMACIST-LED PRESCRIBING EDUCATION PROGRAM FOR INTERNS MEDICAL OFFICER ORIENTATION: DID IT IMPACT PRESCRIBER CONFIDENCE?

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Aim To evaluate the impact of a pharmacist-led prescribing education program on the prescribing confidence of intern medical officers.

Methods The pharmacist-led prescribing education program was delivered to 90 intern medical officers during their orientation. The program began with a simulated medication history to introduce a complex patient case referred to throughout later sessions. Participants then attended 4 x 45-minute interactive small group workshops targeting safe prescribing practices, facilitated by pharmacists and medical education staff. Topics covered were the National Inpatient Medication Chart (NIMC), Insulin Subcutaneous Order and Blood Glucose Record form, Heparin Intravenous Infusion Order and Administration form, and hospital discharge prescribing. Pre- and post-program surveys were conducted with participants asked to self-rate their level of prescribing confidence across five key prescribing domains, using a five-level Likert scale ranging from strongly disagree to strongly agree.

Results The survey was completed by 83 intern medical officers pre- and 76 post-program completion. There was an increase in the percentage of interns who agreed or strongly agreed to feeling confident in their prescribing skills in all five domains as follows: 30% to 83% for prescribing common medications, 51% to 90% for prescribing on the NIMC, 6% to 84% for both insulin and heparin prescribing, and 23% to 82% for discharge prescribing. A greater percentage of participants also reported feeling comfortable seeking clarification from relevant staff if unsure about prescribing medications after the education program.

Conclusion A pharmacist-led prescribing education program can increase intern medical officers' confidence in completing practical prescribing tasks safely.

THE IMPACT OF A PHARMACIST ON POST-TAKE WARD ROUND PRESCRIBING AND MEDICATION APPROPRIATENESS

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Aim We aimed to evaluate the impact of clinical pharmacist participation on the post-take ward round on the appropriateness of medication prescribing, medication communication and health care outcomes of readmission rates and LOS.

Methods Post-take ward rounds were observed during two six-week periods. A senior clinical pharmacist participated in the post-take ward round (intervention), this was compared to usual care alone (comparator). Medication appropriateness was assessed using START/STOPP indicators. Additional outcomes included extent of medication communication including discussions that led to a change in therapy, risk of medication harm and length of stay.

Results Observation of 260 patients occurred in the comparator and intervention cohorts across 23 and 20 post-take ward rounds. Improvements in medication appropriateness were seen with a greater overall proportion of patients who had an improvement (comparator 25.4%; intervention 36.9%);
p=0.004) as well as a larger mean change in START/STOPP scores for the intervention (0.43±0.88/pt) than for the comparator (0.3±0.87/pt, p=0.049).

The inclusion of a pharmacist led to a significant increase in the number of in depth discussions about patients’ medication (1.9±1.7/pt to 2.7±1.7/pt, p<0.001), the number of those relating to high-risk medications (0.71±1.1/pt to 1.2±1.2/pt, p<0.05) and the number of discussions resulting in therapy change (154 to 236). Health care outcomes including length of stay were not impacted.

Conclusion Clinical pharmacist participation on the post-take ward round leads to improved medication-related communications targeted at high-risk medications and improved medication appropriateness for patients.

EMERGENCY DEPARTMENT SCREENING TOOLS TO ASSIST PHARMACISTS TARGETING PATIENTS AT RISK FOR MEDICATION RELATED PROBLEMS

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Aim Having pharmacists practicing in the emergency department (ED) is well recognised, but their major challenge is to identify which patients to target. This study developed screening tools (one for use at ED presentation and one at ED discharge) to identify patients at greatest risk for medication-related problems (MRPs).

Methods We undertook a prospective, observational, multi-centre study. Blocks of ten consecutive adult ED patients presenting at pre-specified times were identified. Within one week of ED discharge, a pharmacist interviewed the patient and undertook a medical record review to determine a medication history, patient understanding of treatment, risk factors for MRPs and to manage any MRPs. Univariate analysis and logistic regression were undertaken. Odds ratios for independent predictors were used to weight variables in the screening tools.

Results Overall 904 patients were recruited (9 EDs, 3 states). Characteristics predicting MRPs that could be managed at presentation were: medication-related presentation to ED (OR 12.94), taking > 8 regular medications (OR 11.54), age > 80 years (OR 2.89), sometimes/often missing medication doses (OR 2.29), seeing a specialist in past 6 months (1.98), concession/pension cardholder (OR 1.73), self-reported medication allergies/sensitivities (OR 1.70).

Characteristics associated with MRPs after discharge were whether a medication requiring complex education was prescribed on discharge (e.g. warfarin, Epipen or inhaler device) (OR 5.75), reporting sometimes/often missing medication doses (OR 5.26), male gender (OR 1.76).

Conclusion Predictors of MRPs associated with ED care that are readily determined at the bedside have been identified. The screening tools are currently undergoing national validation.

STRENGTHENING MEDICATION PRESCRIBING AND SAFETY PRACTICES OF MEDICAL INTERNS THROUGH INTERPROFESSIONAL EDUCATION STRATEGIES

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Aim To optimise medical interns’ medication prescribing and safety practices by implementing multimodal, interprofessional education strategies.

Methods Multimodal education strategies based on medication prescribing and safety knowledge, skills, and workplace application, plus relationship building between medical interns, graduate nurses and intern pharmacists, were introduced in January 2018 orientation and included:

• Interprofessional medication safety workshop, aligned with the patient journey
• Prescribing competency assessment with targeted feedback
• Paid allocated time to complete online training
• Structured meeting/shadowing with unit pharmacist
• Medication safety mobile apps and lanyards.

Strategies were evaluated through surveys, impact on pharmacists’ interventions and training completion rates. Pharmacists’ interventions reported voluntarily in units with medical interns on one day each month between February–April 2017 were compared to February–April 2018.

Results Of the 106 medical interns, the workshop was rated (n=98) as relevant 4.8/5, engaging 4.62/5 and practical 4.65/5, prescribing competency was rated (n=90) as relevant 4.94/5, engaging 4.86/5 and practical 4.92/5, and 83% reported they were more likely to approach the pharmacist.

Pharmacist interventions reduced by 31.4%, from a mean of 322/1,000 bed-days in February-April 2017 to 221/1,000 bed-days in February-April 2018 (paired t-test; p=0.038).

Online training completion rates were high; medication chart prescribing and safety self-assessment increased from 40.7% (2017) to 84.9% (2018), allergies and adverse drug reaction training 98% and medication safety training 100%.
Conclusion Implementation of multimodal, interprofessional medication prescribing and safety education and collaboration strategies, generalizable to other settings, resulted in a 31.4% reduction in prescribing errors and were rated positively by medical interns.
A RETROSPECTIVE AUDIT OF COMMUNICATION BY PHARMACIST WITH PATIENTS FROM REMOTE AREAS

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Aim To determine the patient demographics, BPMH and pharmacist communication practices to primary care providers for patients admitted from remote regions of the Northern Territory to a tertiary teaching hospital.

Methods Hospital admission and medication management software were used to conduct a retrospective audit of patient demographics and BPMH conducted for patients admitted from 2/9/17 to 29/9/17. Patients admitted on the weekend and those without electronic medication charts were excluded. The Rural Generalist Pharmacist conducted semi structured interviews with hospital pharmacists to gather current communication methods and sources of information to complete a BPMH. The results were thematically interpreted.

Results There were 3037 patients admitted over the one-month period with 938 (31%) patients admitted from remote regions. There was little difference in the completion rates of BPMH for remote patients (35%) with that of the general population (32%).

The following themes were identified from the semi-structured interviews; many hospital pharmacists do not have a clear understanding of medication supply in remote areas; the two sources used for BPMH did not include the patient; and there was a large variation in processes used to collect information and communicate with primary care.

Conclusion Additional work will be conducted to develop a streamlined approach for process of communication and prioritisation of remote patients which meet the needs of the primary health care providers. This audit identified the need for training and education to hospital pharmacists on the complexities of medicine management for remote patients.

ANTIMICROBIAL PROPHYLAXIS OF TYPE III OPEN FRACTURES IN TRAUMA PATIENTS

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Aim The objective of this study was to compare cefazolin monotherapy versus cefazolin plus aminoglycoside therapy for prophylaxis of type III open fractures in trauma patients.

Methods This was a multicenter retrospective cohort study conducted in three academic medical centers in the United States. Consecutive adult trauma patients with type III open fractures between January 2014 and September 2016 were included. The cohort consisted of patients who received cefazolin with or without an aminoglycoside. Patients who received aminoglycosides were stratified into two quantiles based on the daily dose. Thus there were three groups overall: 1) no dose (ND) group (i.e. cefazolin monotherapy), 2) lower dose (LD) group, and 3) higher dose (HD) group. The primary outcome measure was occurrence of infection at the open fracture site measured up to at least 30 days.

Results There were 134 patients included in the study cohort. The mean age was 39 ± 15 years, 105 (78%) were male, and the most common fracture location was tibia/fibula (n=74, 56%). The number of patients in each of the three groups was: ND (n=39), LD (n=48), and HD (n=47). There were 21/134 (16%) patients who developed an infection at the open fracture site. This occurred in 6 patients (15%) in the ND group, 6 patients (13%) in the LD group, and 9 patients (19%) in the HD group (p=0.662).

Conclusion Cefazolin monotherapy may be appropriate for antimicrobial prophylaxis of type III open fractures in trauma patients.

VALIDATION OF A BETA-LACTAM ALLERGY ASSESSMENT TOOL TO AID ACCURATE PHENOTYPING AND MANAGEMENT OF ALLERGIES

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Aim Patient-reported antibiotic allergies are frequently encountered in hospitalized patients. We validated an antibiotic allergy assessment tool (AAAT), in a range of healthcare professionals, to aid the evaluation, phenotyping and management of patients with reported beta-lactam antibiotic allergy labels [AALs].

Methods The AAAT utilizes patient-reported symptoms from a beta-lactam AAL to assign a phenotype and management recommendation. AAAT phenotypes were classified as: severe or non-severe immediate hypersensitivity (IgE-mediated), severe or non-severe delayed hypersensitivity (T-cell-mediated), potential immune-mediated (e.g. acute-interstitial-nephritis) or unlikely to be significant/non-immune-mediated (e.g. intolerance). The AAAT utilizes a traffic light system to allocate each phenotype to a corresponding management directive: (i) direct de-labelling, (ii) direct oral rechallenge, (iii) skin-testing, or (iv) outpatient antibiotic allergy assessment. Initially, the tool was reviewed by an
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expert panel, utilizing hypothetical case scenarios. Final validation involved healthcare workers using the AAAT in real-patient case studies.

**Results** Eight antibiotic allergy case studies (immune-mediated [5], non-immune-mediated [3]) were reviewed by 40 participants to validate the tool; 19 junior-doctors (48%), 11 pharmacists (28%), 8 infectious diseases doctors (20%) and 2 specialist nurses (5%). The AAAT demonstrated an overall sensitivity of 91.5% (95% CI:87.9–94.3) for assigning the correct phenotype and 85.9% (95% CI:81.5–89.5) for the appropriate management. When utilized by pharmacists, the AAAT had a sensitivity of 92.9% (95% CI 85.4–97.4) and 96.5% (95% CI:90.0–99.3) for assigning appropriate phenotype and management strategies, respectively.

**Conclusion** The beta-lactam AAAT proved useful for phenotyping AAs and designating appropriate management strategies. Pharmacists could utilize such tools to aid inpatient antibiotic allergy “de-labeling”.

**Antimicrobial Prescribing in Australian Hospital in the Home Services: A Pilot Study**

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**Aim** To perform a pilot study to describe antimicrobial prescribing in the Hospital in the Home (HITH) setting in Australia, using a modified Hospital National Antimicrobial Prescribing Survey (NAPS) tool.

**Methods** All Australian HITH services were eligible to participate in this pilot from April to July 2017. Local auditors, usually a pharmacist, collected data on antimicrobial prescriptions. The indication, compliance with guidelines, therapy appropriateness and duration were assessed according to the NAPS predefined standard criteria.

**Results** From 23 HITH services, 1,154 prescriptions for 715 patients were included. Prescriptions were non-compliant with guidelines in 13.9%. Antimicrobial prescribing was assessed as inappropriate (no documented reason to vary from guidelines) in 11.4% of prescriptions.

The most common antimicrobials were: cefazolin (25.0%), flucloxacillin (12.5%), ceftriaxone (10.2%), piperacillin-tazobactam (9.7%), benzylpenicillin (5.6%), and vancomycin (5.2%). Of these, ceftriaxone had the highest rate of being assessed as inappropriate at 21.2%, usually for respiratory tract infections.

The most common indications were: cellulitis (30.4%), osteomyelitis (8.1%), community acquired pneumonia (5.8%), septic arthritis (5.2%) and bacteraemia (5.0%). The highest rate of prescribing assessed as being inappropriate was for community acquired pneumonia, at 34.3%.

The duration was assessed as non-compliant with recommendations (usually prolonged without justification) in 8.8%. The antimicrobial was assessed as being broader spectrum than necessary based on available clinical information in 8.2%.

**Conclusion** This study has revealed some potential areas for improvement in antimicrobial prescribing in the HITH setting. Specifically the use of ceftriaxone for respiratory tract infections in HITH may warrant more exploration.

EXPLORING THE CONFIDENCE AND EDUCATIONAL NEEDS OF PHARMACISTS IN REVIEWING ANTIMICROBIALS: A CROSS-SECTIONAL, NATIONWIDE SURVEY

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**Aim** To explore Australian hospital pharmacists’ practice, confidence and knowledge in making antimicrobial stewardship (AMS) point-of-care interventions (POCIs) when reviewing antimicrobial prescribing.

**Methods** An online survey link was distributed via the Society of Hospital Pharmacists of Australia eNews (October 2017) with two eNews reminders. The 19-item survey was designed to collect: (i) respondents’ demographics, (ii) self-perceived practice and confidence, (iii) knowledge in making AMS POCIs, and (iv) preferred mode of educational delivery. Descriptive and chi-square statistics were used to analyse responses.

**Results** Four hundred and thirty-nine respondents were analysed. Almost two-thirds were from metropolitan public hospitals (272 [62%]). All states and territories were represented. Respondents were more likely to review intravenous and broad-spectrum antibiotics (ampicillin, ciprofloxacin, piperacillin-tazobactam, vancomycin) within 24–72 hours than oral cefalexin; p<0.001. Many respondents indicated that they lacked confidence (“somewhat confident/not confident at all”) in identifying AMS POCIs around bug-drug mismatches (52%), inappropriate lack of (49%) or overlapping (43%) spectrum of activity, dosing based on infection-related factors (55%), and when infection is unlikely (43%). The median knowledge score (out of 9 items) was 6 (interquartile range 4.5 to 7); key gaps were noted in antimicrobials’ anaerobic spectrum, beta-lactam allergy assessment and dosing in immunocompromised patients. All respondents rated multiple modes of education delivery as “useful/very useful.”
Associations between respondent characteristics and responses to questions will be explored.

**Conclusion** Knowledge gaps and areas of lack of confidence were found that could inform the design of educational strategies for pharmacists to help improve antimicrobial use in Australian hospitals.
**Aim** To assess the impact of an extended pharmacist scope of practice in a collaborative pharmacist-nurse pre-assessment Hepatitis C clinic.

**Methods** Inclusion of a pharmacist in the clinic aimed to facilitate greater access to care and enhance timely medication management. The pharmacist was trained to conduct and interpret Fibroscans and order relevant pathology tests. In addition the pharmacist prepared patient treatment plans prior to the physician appointment. Recommendations of medication interventions detected during the medication review were provided.

Data were collected over a 20-week period from August 2017 and a clinician satisfaction survey conducted.

**Results** A total of 58 patients attended the Hepatitis C clinic, of which 60% (n=35) were seen solely by the pharmacist, resulting in increased service access for 3 patients per week. The pharmacist conducted Fibroscans in 32 patients of whom six were determined to be cirrhotic. After a pharmacist referral for an ultrasound, the initial diagnosis for all cirrhotic. After a pharmacist referral for an ultrasound, the initial diagnosis for all patients were confirmed.

Ninety-seven percent (n=34) of pharmacist treatment recommendations, made after clinical assessment, were accepted by prescribers. Of the 22 interventions (n=16) made, 21 were related to drug interactions of which 90% (n=19) were accepted by prescribers. Prescribers and nurses were highly satisfied with the service with prescribers reporting time savings.

**Conclusion** Incorporating an enhanced scope of practice pharmacist into the Hepatitis C clinic demonstrated positive clinical outcomes for patients and prescribers and increased patient access. Pharmacist’s recommendations allowed prescribers to initiate timely treatment at follow-up appointments. This service has now become standard practice.

**PARTNERED PHARMACIST MEDICATION CHARTING: MULTI-SITE EVALUATION DEMONSTRATING REDUCTION IN LENGTH OF STAY**

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**Aim** To undertake a multi-centre evaluation of translation of a partnered pharmacist medication charting (PPMC) model in patients admitted to general medicine units (GMUs) in public hospitals in Victoria, Australia.

**Methods** Design - Unblinded, prospective cohort study comparing patients admitted before and after PPMC implementation.

Participants – All adult patients admitted to GMUs of seven public hospitals in Victoria from 20 June to 24 September 2016.

Intervention – Admission medication charting by pharmacists using a partnered model compared to traditional charting by doctors.

Outcome measures - The primary outcome was hospital length of stay (LOS). Secondary outcomes included medication errors on inpatient medication charts identified by independent pharmacist assessors within 24-hours of admission.

**Results** A total of 8,648 patients were included in the study (pre-intervention=5612; post-intervention=3036). The total number of medications charted was 53,371 in the pre-intervention cohort and 31,658 in the post-intervention cohort. Patients whose medications were charted using the PPMC model had a statistically significant reduced median length of hospital stay from 4.7 (IQR 2.8–8.2) days to 4.2 (IQR 2.3–7.5) days (p<0.001). PPMC was associated with a reduction in the proportion of patients with at least one medication error from 66% to 3.6%, with a number-needed-to-treat (NNT) to prevent one error of 3.3 (95% CI: 3.1–3.5).

**Conclusion** The introduction of a partnered pharmacist charting model was associated with reduced hospital length of stay, number of medications errors and potential harm reduction across seven Victorian public hospitals. It is recommended that PPMC is adopted across health services.

**CLINICAL PHARMACIST IMPACT ON OUTPATIENT DIALYSIS SERVICES**

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**Aim** A health network in Victoria provides comprehensive care for outpatient dialysis patients across three sites, however only one site provides clinical pharmacy services. This study investigated clinical and financial impacts of clinical pharmacy services in dialysis units (intervention site) compared with control sites receiving no services.

**Methods** A retrospective cohort study between June and November 2016 was undertaken. Clinical and financial outcomes for dialysis patients at the intervention site were compared with control sites. Clinical measures included within-range haemoglobin and phosphate levels, which are key performance indicators used by the network’s Dialysis Service, and are National dialysis standards. Mean renal readmission rate per dialysis patient and mean readmission costs per dialysis patient per year were calculated and compared for intervention and control sites.

**Results** Haemoglobin and phosphate levels were maintained within range for 76% (Hb) and 70% (Ph) of patients at the intervention site compared with 58% (Hb) and 53% (Ph) at control sites. Mean...
readmission rate per dialysis patient at the intervention site was 0.57 (95% CI 0.30–0.88) compared with 0.71 (95% CI 0.2–1.22) at control sites. This equated to a cost saving of $1400 per dialysis patient per annum at the intervention site.

**Conclusion** Clinical pharmacy services correlated with improved clinical and financial outcomes at the intervention site, which supports the implementation of these services across all sites within the network.

**WHAT CAN BE ACHIEVED IN 3 HOURS? – ESTABLISHING A PHARMACIST ROLE IN PAEDIATRIC RHEUMATOLOGY CLINIC**

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**Aim** To describe and evaluate the implementation of pharmacy service in a paediatric rheumatology outpatient clinic.

**Methods** In consultation with the Director of Paediatric Rheumatology, a weekly pharmacy service (Mondays 1–4pm) in the rheumatology outpatient clinic was established with a target cohort of patients (who are on multiple and/or high risk medications). The clinic pharmacist provides comprehensive medication history taking, adherence assessment, medication counselling, clinical interventions and pharmaceutical care plans. Financial benefit, number of patients seen, number and significance of clinical interventions and end-user feedback are used for service evaluation.

**Results** The pharmacy service was provided in the paediatric rheumatology clinic for 19 weeks to date (February–June 2018). Rheumatology outpatient pharmacy service has generated 10.7 weighted activity units which is equivalent to $52,517.52. Ninety patients have been reviewed with an average of 4.7 patients seen per 3-hour clinic. Over 120 clinical interventions have been made ranging from drug information provision, counselling, drug safety concerns, immunisation referral, medication rationalization, stress steroid plan and compliance advice. Examples include 1) discovering and intervening on drawing multiple doses from a single methotrexate vial the puts the patient at high infection risk and 2) identifying and rectifying a patient with juvenile idiopathic arthritis who has been taking high dose corticosteroid for 3 months due to weaning schedule not being understood. Pharmacy received positive feedback from medical and nursing staff, as well as families.

**Conclusion** Pharmacists’ role in paediatric rheumatology clinic is cost effective and life-saving. 3 hours per week is time well spent.

**PHARMACIST-LED MEDICATION EDUCATION INTERVENTION IMPROVES OUTCOMES AMONG AMBULATORY PATIENTS WITH DECOMPENSATED CIRRHOSIS**

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**Aim** To measure the impact of pharmacist intervention on (i) knowledge of disease/medication self-management, (ii) quality of life, and (iii) outcomes for ambulatory patients with decompensated cirrhosis.

**Methods** A clinical pharmacist-driven medication education intervention was implemented as a randomised-controlled trial in a multidisciplinary hepatology clinic. Patients’ knowledge of self-management tasks (8 questions), perceptions of illness (Brief Illness Perception Questionnaire), and quality of life (Chronic Liver Disease Questionnaire) were assessed at recruitment and follow-up (6 months). Patients were followed for 12 months or until death. Clinical data were obtained via patient history and medical records. Comparisons between groups and paired change over time were examined using the Mann-Whitney U and Wilcoxon signed rank tests respectively. Backward conditional regression identified factors associated with hospitalisation.

**Results** 116 patients were randomised (aged 58.8±10.2 years, 62.5% male and median Child-Pugh score=8.0). 59 received usual care and 57 received the intervention. There were no significant differences in demographics or clinical status between groups.

At follow-up, 42 usual care and 39 intervention patients completed the survey. Compared to usual care, intervention participants had better knowledge of self-management (p=0.009) and higher perceived understanding of liver disease (p=0.004). Intervention patients also had significantly improved quality of life from baseline (p=0.031); usual care patients did not. Intervention patients were less likely to have ≥1 all-cause unplanned admission during the follow-up period (adjusted odds ratio=0.30, 95% CI 0.12–0.76, adjusted for variceal bleeding and Child-Pugh score).

**Conclusion** Pharmacist-led patient education improved patient outcomes. Extension of pharmacy services to multidisciplinary hepatology clinics should be considered.
INTENSIVE CARE UNIT MEDICATION MANAGEMENT TECHNICIANS (ICU-MMT) – PHARMACY TECHNICIANS LEADING THE WAY IN MEDICATION ACCESS

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Aim To describe the ICU-MMT role: ICU-based Pharmacy Technicians coordinating the preparation of infusion medications to facilitate timely medication availability, reduce medication errors and expenditure due to wastage.

Methods In consultation with senior ICU staff, a pharmacy working group performed ward usage audits, financial analyses, and stability and sterility assessments using Product Information, extended manufacturer’s data, or assessment by an external compounding facility. The new service development was presented to ICU Senior Nursing Leadership and medication safety concerns were addressed, and aseptically-validated technicians selected for the role.

Results Staged implementation began in July 2018 with four medications (caspofungin, hydrocortisone, erythromycin, vancomycin) prepared by an ICU-MMT rostered to ICU. Appropriate patients are identified by the ICU-MMT through ward-rounds, medications are prepared at a central ICU location, with the patient’s nurse providing the second medication check. Medications are prepared according to Australian Injectable Handbook, aseptic non-touch techniques, and in-house guidelines. Currently between 10–20 infusions are prepared daily. Stage two introduced a second ICU-MMT batching noradrenaline in the Pharmacy Aseptic Suite to centralise preparation of a high-risk medication and reduce wastage; with >$100K expected annual saving of ICU medication expenditure.

Conclusion Aseptically-trained ICU pharmacy technicians cost-effectively deliver infusions at the bedside in a timely manner. Batching medications within ICU and pharmacy has reduced medication wastage. This new role highlights further opportunities for technician role expansion, particularly in coordinating medication preparation within critical services.

IS A UK-TRAINED ACCURACY CHECKING PHARMACY ASSISTANT AS PROFICIENT AND EFFICIENT AS AN AUSTRALIAN PHARMACIST?

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Aim To compare the proficiency and efficiency of a UK-trained accuracy checking pharmacy assistant (ACPA) performing the accuracy check on dispensed items versus Australian pharmacists in a hospital setting.

Methods A randomised trial was undertaken on both inpatient and outpatient items in a Queensland hospital pharmacy dispensary. Medication orders that met the inclusion criteria were allocated randomly to be checked by either a clinical pharmacist or a UK trained ACPA. All included medication orders were rechecked by a blinded clinical pharmacist who recorded information regarding the accuracy of the dispensed item compared to the written medication order. Time efficiency information was taken from the hospital tracking software as well as self-reported by the checkers.

Results Pharmacists checked 1223 items, with 7 major errors (0.57%), while the ACPA checked 1336 items with 2 major errors (0.15%). Recorded “arrival to complete time” was 83.56 minutes for the pharmacists and 68.30 minutes for the ACPA. The recorded “start to complete time” was 46.66 minutes for the pharmacist and 35.24 minutes for the ACPA.

Conclusion The UK-trained ACPA was found to be more accurate and time efficient than the pharmacists. These results provide a strong case for wider implementation in the delegation of accuracy checking to pharmacy assistants in Australia, in conjunction with appropriate pre-cursor training programs and a legal and indemnity framework.

TRAINING FOR SUCCESS IN CHEMOTHERAPY COMPOUNDING

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Aim Increased chemotherapy demand and expansion of the chemotherapy compounding service at a tertiary hospital led to increased patient wait times and staff discontent. To overcome this, we aimed improve operational efficiency and revise quality assurance programs for chemotherapy compounding in line with new pharmacy board compounding guidelines.

Methods An internal review of cleanroom practices was conducted to inform development of a competency-based training program to meet theory and practice requirements for staff involved in compounding chemotherapy. A senior pharmacy technician (PT) role for training and credentialing was developed.

Results All PTs were enrolled in a one-week aseptic training course then orientated to various roles within the unit under the direct supervision of the senior technician for a 6–8 week period. Competency was assessed by observation and theory testing across each role and at various stages. Patient wait time, proportion of chemotherapy available before patient appointment, and proportion of contaminated settle plates were measured from January 2017 to June 2018. Over 18 months, 11 PTs were enrolled on the training program. Six PTs were deemed competent, 3 PTs
were in-training, and 2 PTs required re-training. Contamination of environmental microbial monitoring plates reduced from 12% in January 2017 to 3%, in October 2017. Proportion of chemotherapy ready before patient appointment increased from 52% to 72%, and median patient wait time reduced from 45 minutes to 15 minutes sustained till current.

**Conclusion** A chemotherapy compounding training and competency assessment program is crucial to maintaining a high standard of cleanroom practice.

**Results** A total of four technician CE’s were held in 2017. Due to technical difficulties attendance data and session feedback was not available for 1 of the 4 sessions. The remaining 3 sessions were attended by 115 participants, with approximately half (53%) attending in person and the remainder by webinar. General feedback from participants was positive, with concerns raised regarding cost of technician CE events as well as the value of the CE events for those technicians undertaking the Certificate IV in Hospital Pharmacy Services. Following this feedback attendance fees were reduced and attendance certificates issued following each event. Repeat attendance and an increase in technician membership for NSW was also seen in 2017.

**Conclusion** The technician-led CE program continues to be successful and feedback from attendees has been essential in its continued development.

**Aim** In 2017, the SHPA NSW State Branch formed the NSW Technician Subcommittee to promote networking between NSW technicians. With the support of the state branch this subcommittee implemented a technician-led continuing education (CE) program. The aim of this study is to evaluate the technician-led continuing education program.

**Methods** Each Technician Observer on the branch organised a CE with input from the Technician Subcommittee as to what topics would be beneficial to technicians. CEs were made available via webinar to allow access to rural and interstate members. At each event the number of participants was recorded and each participant was asked to provide specific feedback on the session itself as well as general feedback on CEs.

**Results** A 12-month supernumerary ATSI traineeship position was successfully implemented. Grant funds supported salary costs of Senior pharmacist/technician supervision and Certificate III completion. A formal training package was developed including competencies, training materials and assessment resources. Implementation of the traineeship anecdotally had a very positive impact on the pharmacy department’s staff, service and trainee. Staff cultural awareness was enhanced, and the program supported the network’s Aboriginal Employment strategy.

**Conclusion** A traineeship was successfully developed to support an indigenous worker to obtain a Certificate III Hospital Health Services Pharmacy Support, and develop workplace skills and experience providing a suitably skilled and qualified ATSI candidate for future technician recruitment.
TIME TO MOVE FORWARD

Dr Louise Mahler

*International Leadership Influencer, Melbourne, Vic.*

The future is steaming ahead on a track of continued digital innovation, but ‘mind the gap’. Between the fast moving juggernaut of change and the platform of knowledge, is a widening chasm of interpersonal skills to inspire and engage. Dr Louise Mahler’s award winning PhD has made her a thought leader in the field of presence and influence, where she was chosen by IBM as one of 50 leaders in the field. She advises Australia’s leaders, in charge of billions of dollar, on managing themselves and those in their space for amazing results. No more ‘resting bitch face’, no more ‘silence in adversity’, no more lack of recognition. Speak up, be heard and have your worth valued. In this highly interactive and often hilarious presentation, you will change your habits and thinking around communication and leave happy and engaged for your Gala dinner. You may even have a song in your heart.
WORKSHOPS AND CONVERSATIONS

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PLENARY SESSION FOUR

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WORKSHOPS AND CONVERSATIONS
1030–1230

W1 – TIME TO INSPIRE – ENHANCING TECHNICIAN CONFIDENCE IN CONTRIBUTING TO PATIENT CARE
Plaza 5
Sharon Goldsworthy¹, Pippa Burchnall², Margie Butnoris³
¹The Queen Elizabeth Hospital, SA, ²Gold Coast Health, Qld, ³Royal Brisbane and Women's Hospital, Qld

It's Time... Time to realise the pivotal part that you play in patient care, time to gain confidence in your contribution to pharmacy and the essential role you play in your team, and time to inspire others in your workplace to do the same.

W2 – ELECTRONIC MEDICATION MANAGEMENT
Plaza 3/4
Andrew Matthews¹, James Grant², Danielle Stowasser³, David Robertson², Natalie Page¹
¹Medicines Safety Program, Qld, ²eHealth Queensland, Qld, ³Metro North Hospital, Qld

Immerse yourself in the digital world of health during this interactive workshop lead by experts. Collaborate with your peers to work through some of the biggest challenges and risks moving forward with Electronic Medication Management.

W3 – CULTURALLY SAFE AND RESPONSIVE PRACTICE – AN INTRODUCTORY WORKSHOP TO THE INDIGENOUS ALLIED HEALTH AUSTRALIA (IAHA) CULTURAL RESPONSIVENESS FRAMEWORK
Plaza 9
Michelle Rothwell¹, Kylie Stothers²
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It is essential that all pharmacists working in the health system in Australia are culturally responsive in order to positively affect the health and wellbeing of Aboriginal and Torres Strait Islander people. This workshop is about building culturally responsive capabilities in the workplace in order to have a culturally safe and responsive health system for Aboriginal and Torres Strait Islander peoples.

Indigenous Allied Health Australia (IAHA) is a national not for profit, member-based Aboriginal and Torres Strait Islander allied health organisation. IAHA is pleased to provide participants with an opportunity, in a safe environment, to gain insight into cultural safety and to engage in self-reflection and practical activities that will enhance their leadership capacity and ability to take culturally responsive action. Based largely upon Cultural Responsiveness in Action: An IAHA Framework, this workshop is for pharmacists, managers, policy makers and pharmacy support staff interested in providing culturally safe and responsive care with Aboriginal and Torres Strait Islander individuals, families and communities.

W4 – RISKY BUSINESS – TOP PRIORITIES IN OPIOID SAFETY ACROSS CLINICAL SETTINGS
Plaza 8
Joann Rotheram¹, Chris Joyce¹,³, Mark Daglish²,³, Marc Walden², Benita Suckling³, Daniel Lim⁴, Penny Tuffin⁵, Johanna de Wever⁶, Thuy Bui⁷
¹Princess Alexandra Hospital, Qld, ²Royal Brisbane and Women’s Hospital, Qld, ³Redcliffe Hospital, Qld, ⁴St Vincent’s Hospital Melbourne, Vic., ⁵Royal Perth Hospital, WA, ⁶SHPA, Vic., ⁷Alfred Hospital, Vic., ⁸University of Queensland, Qld

Opioid agents are used in vastly different settings across the healthcare spectrum. We ask the experts in each field to provide an overview of the chief issues surrounding the use of opioids today and how we should best practice moving forward. The modern era of opioids poses complex challenges for clinicians and adopting a holistic interdisciplinary approach is key in optimising patient care and safety.
**W5 – TIME-CRITICAL THINKING – EXPLORING CRITICAL THINKING AND REASONING FOR ALL PHARMACISTS DURING CLINICAL DETERIORATION**

Plaza 1/2

Elizabeth Doran¹, David Hughes¹, Karlee Johnston², Francesca Dowland¹, Jacqui Marks¹, Megan Purvey¹

¹Royal Brisbane and Women's Hospital, Qld, ²Canberra Hospital, ACT, ³Gold Coast University Hospital, Qld

Clinical pharmacist involvement in medical emergencies across all clinical environments is an expanding area of practice in Australian healthcare settings, primarily lead by critical-care pharmacists. However, all generalist clinical pharmacists work in clinical environments with increasing levels of patient acuity and patients at risk of clinical deterioration.

Pharmacists are ideally placed to provide effective and timely clinical medication advice during situations of patient clinical deterioration.

This workshop will explore the role all pharmacists can play in the management of deteriorating patients within general clinical settings and explore critical thinking opportunities for development.

Attendees will be challenged in an interactive learning experience that will include the management of common ward-based clinical scenarios involving acutely deteriorating patients, led by experienced pharmacists and medical practitioners.

This workshop will suit early to mid-career pharmacists or indeed any pharmacists wanting to develop clinical reasoning and critical-thinking skills.

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**W6 – VALUE-BASED RECRUITMENT**

Plaza 10

Col Smyth¹, Rebecca Judd², Midori Nakagaki¹, Sinead Carmichael¹, Paul Firman²

¹Royal Brisbane and Women's Hospital, Qld, ²Logan Hospital, Qld

There is nothing more important than the people you recruit into your department to be a part of your team: they shape the way your team becomes an effective member of the hospital and create the culture of your department.

However, we know that traditional interview processes concentrate more on clinical skills, and less on the core values of the staff that make up your team.

This workshop is designed to demonstrate the importance of Value Based Recruitment: a novel style of interviewing techniques that focus on the candidate's values, which in turn drive their beliefs and behaviours. It appreciates that clinical skills can still be assessed but can also be taught.

Questions can be tailored to align with the core values of your health service, such as respect, collaboration, integrity, compassion and high performance.

So, if you are recruiting for your department, or a less experienced pharmacist looking to excel in the interview process, this could be the workshop for you!

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**W7 – RESILIENCE – BUILDING PERSONAL AND WORKFORCE RESILIENCE TODAY, TO COMBAT THE CHALLENGES OF TOMORROW**

Mezzanine 1/2

Karen Whitfield¹, Ian Coombes¹, Andrew Hale¹, Cameron Tessier¹

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This will be an interactive workshop that will include the following activities:

- Identify common factors that cause depletion of personal resilience in the workplace.
- Identify a range of factors that can strengthen personal resilience.
- Identify factors that have shown to help individuals and workforce combat stress at work to enhance resilience and improve performance.
- Identify a range of tool that can assist in setting personal and workforce goals to allow ongoing evaluation.

The workshop will include small group work to brainstorm factors that cause depletion of personal resilience in the workplace, strategies to build person and team resilience and factors that can strengthen personal resilience and work-life balance.
FUTURE TIMES

Dr Jordan Nguyen

Biomedical Engineer, NSW

With today’s staggering advances in technology, many new possibilities are emerging which almost seem to have come straight out of the realms of sci-fi fantasy. When we connect some of the dots between various cutting-edge fields, the innovations become even more intriguing.

In this presentation, Biomedical engineer Dr Jordan Nguyen will raise an incredibly interesting conversation around links drawn between such fields as artificial intelligence, virtual reality, new techniques in 3D human scanning, neuroscience, and robotics. These are impacting the way we work and the way we live moving into a new future. A future we have the opportunity to shape into a positive one, but we all have a role to play in this, and the first step is opening our minds to the emerging possibilities headed our way. How can we embrace, adapt, and even thrive in these times of rapid change?
Clinical
  Posters 1–209 ................................................................. 70

Digital / IT Health
  Posters 210–242 .............................................................. 151

Leadership
  Posters 243–253 .............................................................. 164

Workforce / practitioner development
  Posters 254–307 .............................................................. 169
Aim

To retrospectively analyse whether, in the context of a nation-wide vancomycin shortage, surgical antibiotic prophylaxis with teicoplanin was more appropriately prescribed and administered than vancomycin, when compliance against local surgical prophylaxis guidelines were assessed.

Methods

A retrospective analysis was completed of patients who received intra-operative vancomycin at a major metropolitan hospital during a two-week period prior to the critical vancomycin shortage (13th to 26th February 2017), and patients who received intra-operative teicoplanin during a two-week period during the vancomycin shortage (20th March to 2nd April 2017). Appropriateness assessments were made with regard to indication, dose and administration according to organisation-wide surgical prophylaxis guidelines.

Results

The period prior to the critical vancomycin shortage saw vancomycin used during 21 of 649 surgical cases (3%). 16 of these cases (76%) were assessed as being non-compliant with guidelines for indication, dose and/or administration. The most common reason for being assessed as non-compliant was inappropriate timing of administration prior to surgery. One limitation identified was variable documentation of ‘surgery start times’.

The time period coinciding with the critical vancomycin shortage saw teicoplanin administered during 27 of 619 surgical cases (4%). 18 occasions (63%) were assessed as being non-compliant with guidelines. Errors in dosing and indication were observed.

Conclusion

Teicoplanin was not used more appropriately than vancomycin for surgical prophylaxis, making the added expense of teicoplanin difficult to justify outside the context of a vancomycin shortage. Re-familiarisation of surgical staff with relevant guidelines may improve compliance and optimise surgical antibiotic prophylaxis in the peri-operative period.

2  IN THE AGE OF ‘DR GOOGLE’, ARE MEDICINES INFORMATION SERVICES STILL RELEVANT?

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Aim

To examine pharmacists’ perceptions of the use and impact of a dedicated medicines information (MI) service.

Methods

Pharmacists working in a large metropolitan teaching hospital were invited to anonymously complete a paper-based questionnaire exploring their perceptions and use of a medicines information service. The questionnaire, comprised of Likert-style and multiple-choice questions, was collaboratively developed by a team of pharmacists from two different sites. Data were entered in an Excel spreadsheet and descriptive statistics analysed.

Results

In total 86% (n=42/49) of pharmacists available during the 2-day snapshot time frame completed the questionnaire. 40% of respondents had more than 10 years’ hospital pharmacy experience, 30% had 3–5 years’ experience and 12% had 1–2 years’ experience. 86% had utilised the MI service in the past year.

Almost all respondents (98%) reported that the service provided by MI had a positive impact on patient care/safety, and 95% responded that the MI service plays an essential role within the hospital.

The main reasons why respondents used the service were:

• not being able to locate required information (76%)
• reassurance of clinical reasoning/decision making (72%)
• the expertise of specialised MI pharmacists (72%)
• time-critical nature of enquiry (45%)
• not enough time/too busy (40%)

62% reported the service saved them time.

Conclusion

Recent reductions in the availability of MI services nationally have significant implications for patient care and medication safety. The results of this questionnaire demonstrate that despite readily available web-based clinical information, MI services are still perceived as essential.
side effects to changes and confirmation of compliance to changes.

Results 24 patients identified as taking medications listed in the deprescribing tool. After clinical review the inpatient pharmacist recommended 14 of these to be changed/ceased. After team review 10 patients had changes to their medications. 7 outpatient follow-ups were conducted with 6 showing still compliant with the changes and nil undesired side effects to changes in regimens.

Conclusion These deprescribed medications helped decreased tablet burden in the target patient group. The deprescribing tool published in American Journal of Kidney Disease in 2017 is easily adapted to an inpatient/outpatient setting with success. It was easily incorporated and did not increase everyday workload. This process helped improve communication and awareness of patients between the inpatient and outpatient setting and was a great way to facilitate collaboration between the two settings.

4 SUDDEN SHOCK: RITUXIMAB DESENSITISATION AFTER AN ANAPHYLACTOID REACTION

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Objective To describe a desensitisation regimen in a patient who had previously experienced an anaphylactoid reaction to rituximab.

Clinical Features A 29-year-old female was admitted to a metropolitan teaching hospital with a provisional diagnosis of refractory transverse myelitis with progressive ascending flaccid paralysis which progressed to quadriplegia.

After failing treatment with standard therapies which included intravenous immunoglobulin, high dose methylprednisolone and plasma exchange, intravenous rituximab was trialled. Despite administration of premedication, the patient had an anaphylactoid reaction one hour after the infusion commenced and the infusion was ceased immediately. Intravenous immunoglobulin was re-trialled, however subsequent doses proved to be unsuccessful.

Interventions, Case Progress and Outcomes After the available limited literature was reviewed, and in collaboration with immunology, the intensive care pharmacist, drug committee pharmacist and medicines information unit devised a rituximab step-rate cumulative dose desensitisation protocol. Pharmacy determined the appropriate dilution to ensure stability of rituximab as well as reduce drug wastage in the reconstitution process.

The full dose of rituximab (1 g) was administered over 6.5 hours as part the treatment plan and the patient experienced no signs of anaphylaxis or other complications during or post infusion. As a result, the patient received a second dose of rituximab one week later using the same administration guideline.

Conclusion Desensitisation should be considered when treatment with a particular agent is considered essential but limited by reactions such as anaphylaxis. In this case a step-rate cumulative dose desensitisation regimen was successfully used to desensitise a patient following an anaphylactic reaction to rituximab.

5 VENOUS THROMBOEMBOLISM RISK DOCUMENTATION, PRESCRIBING RATES AND APPROPRIATENESS OF PROPHYLAXIS: A PROSPECTIVE, MULTISITE AUDIT

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Aim To determine the proportion of adult inpatients assessed for venous thromboembolism (VTE) risk and prescribed VTE prophylaxis appropriate to their level of risk.

Methods A prospective audit of VTE prophylaxis was undertaken at five sites of a large metropolitan hospital network. Acute and subacute adults admitted for greater than 24 hours were identified between 13/6/17 and 3/7/17. National inpatient medication charts (NIMC), electronic medical records (EMR) and progress notes were reviewed to determine VTE risk documentation by treating medical program, level of VTE risk, type of mechanical or pharmacological prophylaxis prescribed, appropriateness of prophylaxis according to hospital-endorsed VTE prophylaxis guidelines.

Results 240 patients were included (median age 73; 55% female; median length of stay=5 days). General medicine was the most common treating medical program (25.4%). Overall, VTE risk documentation was 31.7%. Documentation at hospital sites using the EMR was 40.3% compared with ≤2% utilising NIMC. 70% of patients were prescribed VTE prophylaxis appropriate to their level of risk. 15.4% were not prescribed mechanical and/or pharmacological prophylaxis that was indicated, 10% were prescribed mechanical and/or pharmacological prophylaxis that was not indicated or contraindicated, and 4.6% were prescribed pharmacological prophylaxis that was indicated or contraindicated, and 4.6% were prescribed pharmacological prophylaxis at the wrong dose. 155 (65%) charts underwent clinical pharmacy review. Pharmacological prophylaxis was appropriately prescribed in 80.6% of
pharmacist-reviewed charts compared with 61.2% of non-reviewed charts.

**Conclusion** This prospective audit demonstrates 30% of patients did not receive appropriate VTE prophylaxis. Sites using the EMR have higher rates of VTE risk documentation, and clinical pharmacist review increases VTE guideline compliance.

6 **THE JOURNEY FROM ICU – PHARMACISTS NEEDED MORE THAN EVER IN THE DIGITAL WORLD**

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**Background** Re-prescribing medications from an ICU medication chart to a ward medication chart is a known area where preventable errors occur – particularly between 2 different digital medication charting programs. Electronic prescribing for the general wards was recently introduced at this large tertiary hospital, thus a new process needed to be developed by the pharmacists for transcription checking the patients who discharged from ICU.

**Aim** To discover the proportion of patient charts seen by the ICU pharmacist prior to ward discharge and ways to improve pharmacist involvement in the discharge process given 1 in 3 charts had an error or intervention classified as “clinically significant”.

**Methods** Prospective audit of digital medication charts over a period of 8 weeks recording the percentage of charts reviewed by pharmacy.

**Results** Out of 280 discharges the pharmacists saw a total of 85% of the charts on weekdays, totalling only 62% of all ICU ward discharges due to a lack of weekend cover. This is concerning given the error rates described above.

**Conclusion** A pharmacist transcription checking the chart prior to discharge is an integral part of the ICU discharge process. A standardised digital note was created to advise ward pharmacists chart transcription had been checked and any issues to follow up. Registrars are now advised to notify the pharmacist once they have completed re-prescribing so it can be checked prior to discharge. The ICU pharmacists are now planning on a trial Saturday morning pharmacy service for 3–4 hours to check discharge charts.

7 **MEDICINE INFORMATION PROVIDED TO INPATIENTS – ARE WE DOING WHAT PATIENTS WANT?**

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**Aim** To explore inpatients’ perceptions of medicine information provided in a regional tertiary hospital, and to investigate what information is relevant to patients.

**Methods** A survey was developed, piloted and verbally administered to medical and surgical inpatients. The questionnaire explored what medicine information had been received by patients, who provided it and what was the patients’ preference for medicine information.

**Results** Fifty-three patients participated in the survey (53% female, mean age 63.7± 15.2 years, 58% surgical patients, median day of inpatient stay at time of interview 6(4,9)). Sixty-eight percent of patients remembered a pharmacist speaking about pre-admission medicines. Doctors and nurses were reported as more likely to discuss newly-initiated medicines during the admission than pharmacists (45% vs 39%) which varied across medical and surgical wards. While 68% of patients thought it was important to be told what medications were administered, 59% stated they did not want to receive extensive information about medications not continued on discharge.

**Conclusion** This study provides a unique insight into patients’ perception of medicine information provided and their preferences during hospital stay. The outcomes inform current practices and have promoted pharmacist education regarding speaking to patients about medicines.

8 **RESISTANT PHANTOM LIMB PAIN: TREATMENT WITHOUT A LEG TO STAND ON**

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**Objective** Phantom Limb Pain (PLP) is a challenging condition to treat, especially when “traditional” treatment modalities fail, as there is little robust clinical trial data. Standard neuropathic pain type medications are initially prescribed, although when these are unsuccessful, less common treatment options should be used. This case discusses the use of salmon calcitonin in a patient with severe, resistant PLP, and how successful the treatment was in this patient.

**Clinical Features** The case involves a 58-year-old female who underwent trans-tibial amputation post popliteal artery thrombosis complicated with systemic illness. Post-amputation the patient experienced severe PLP despite the use of multiple neuropathic pain agents, opioids and simple analgesia.

**Interventions** After consultation with the treating medical team, and conducting a literature search, intravenous calcitonin was initiated at a dose of 100 units on the first day, then a second infusion of 200 units two days afterwards.
**Aim**

To replace bottles with unit dose pods, eliminate liquid discrepancies, guarantee product quality and minimise time spent governing opioids.

**Methods**

A single use container was developed for oxycodone liquid in conjunction with a TGA-licensed manufacturing facility, taking into consideration: patient safety, fill volume to suit dosage range, labelling requirements, and physical durability to suit both automated and standard storage cabinets.

A paediatric ward piloted the use of oxycodone pods following a dedicated education program to nurses and pharmacists. Campus-wide implementation followed.

**Results**

Between May 2017 and May 2018 oxycodone, morphine, hydromorphone and codeine bottles were progressively replaced with pods in 27 wards. Discrepancies were analysed comparing pods with bottles. 3062 pods were distributed with nil discrepancies and 133 bottles distributed with 16 (12%) reported discrepancies. Statistical significance was demonstrated using a two-way chi-square test, reporting a p-value of 0.00035.

A clinical staff survey (n=86) reported inventory counts were faster (91%). Staff confidence in product integrity was superior for pods (98%) compared to bottles (28%), p<0.0001. Time required for resolving discrepancies was substantially reduced, since no discrepancies were reported with pods.

**Conclusion**

The implementation of pods has improved the management of controlled drug liquids with reduced time spent resolving discrepancies and staff confidence in product quality being improved. Two additional hospitals have since implemented pods.

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**Case Progress and Outcomes**

Prior to the calcitonin infusion, the patient’s pain scores were consistently nearing 8/10 on the Visual Analogue Scale (VAS). Post calcitonin infusion VAS scores were reduced to an average of 4/10 which had a lasting effect for 3 months. This clinically significant reduction in pain (50% reduction) has led the patient to better pain control and better quality of life.

**Conclusion**

Intravenous calcitonin has shown to be useful anecdotally in the rehabilitation setting to treat severe, resistant PLP in combination in addition to standard neuropathic pain agents. However, future trials are required.

**ORAL LIQUID OPIOIDS: THE BENEFITS OF MOVING FROM BOTTLES TO UNIT DOSE PODS**

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**Background**

Proprietary oral opioid liquids are difficult to manage in the ward environment. Bottle overage and measurement losses result in reportable end of bottle discrepancies. Product quality cannot be guaranteed after multiple dosing events.

**Aim**

To replace bottles with unit dose pods, eliminate liquid discrepancies, guarantee product quality and minimise time spent governing opioids.

**Methods**

A single use container was developed for oxycodone liquid in conjunction with a TGA-licensed manufacturing facility, taking into consideration: patient safety, fill volume to suit dosage range, labelling requirements, and physical durability to suit both automated and standard storage cabinets.

A paediatric ward piloted the use of oxycodone pods following a dedicated education program to nurses and pharmacists. Campus-wide implementation followed.

**Results**

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**Conclusion**

The implementation of pods has improved the management of controlled drug liquids with reduced time spent resolving discrepancies and staff confidence in product quality being improved. Two additional hospitals have since implemented pods.

**Clinical**

**APIXABAN DOSING GUIDELINES IN ATRIAL FIBRILLATION: IMPLEMENTATION IN THE REAL WORLD**

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**Objective**

To present a case that illustrates the challenges of prescribing apixaban in certain populations and to examine the clinical decision process in determining an appropriate dose.

**Clinical features**

An 87-year-old female in atrial fibrillation presents with acute ischaemic stroke. She weighs 59 kg, serum creatinine is 58 micromol/L, calculated creatinine clearance 56 mL/minute. The plan is to commence apixaban for stroke prevention.

**Interventions, Case Progress and Outcomes**

The Australian product guidelines recommend a dose reduction to 2.5mg twice daily for patients aged 80 years or older who weigh 60kg or less. Two questions were directed to the pharmacist from the medical team.

1. In this patient who is over 80 years old and just under 60kg with reasonable renal function will the dose reduction provide the best outcome?

2. What is the basis of the dose reduction recommendation, and why does it differ to the dosage recommendations for treatment of venous thromboembolism?

**Conclusion**

Dosing of apixaban is a current topic of interest in the literature with recent research suggesting that underdosing of apixaban is not uncommon.

Critical analysis of available information is vital when applying product information dose recommendations.

**Potentially Potentially Life Threatening Oral Methotrexate Dosing Errors Reported in NSW Hospitals**

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**Objective**

To determine the incidence of oral methotrexate dosing errors reported in NSW public hospitals.

**Methods**

A retrospective analysis of records held by the Incident Information Management System (IIMS, the incident reporting system for NSW public hospitals). Entries involving methotrexate were extracted from 01-01-2010 to 21-04-2015, and manually reviewed. ‘Incidents’ were classified as oral
Clinical

methotrexate administered for three or more consecutive days. ‘Near misses’ were methotrexate charted or dispensed daily but the error was realised before three days elapsed.

Results In total there were 63 near miss events and 4 incidents resulting in daily dosing for three or more days. Of the near misses, 24 were detected by pharmacy staff, two by nursing staff, two by medical staff and one by the patient (not stated in the remaining 34 cases). There was one death: an elderly patient given 10mg methotrexate for three consecutive days. Eight days later the patient died from neutropaenic sepsis. Frequency of these reports has remained stable over the time period studied, with 11 to 13 reports/year.

Conclusion Potentially fatal errors with oral methotrexate continue to occur in NSW hospitals, despite several measures implemented to reduce the risk of error. This builds on previous data showing increased oral methotrexate dosing errors in the community, including several recent deaths. This highlights the role of the pharmacist in medication safety and the value of timely review by pharmacists. This includes weekend staffing, as methotrexate could be given daily Friday – Sunday before pharmacy became aware of it on Monday.

Aim To demonstrate the clinical benefits beyond supply of ward pharmacy technicians on an acute medical ward setting in a regional tertiary hospital.

Methods The ward technician’s role included supply of imprest medicine, as well as independent supply of all inpatient medicines except for PINCH drugs. Often this occurs prior to pharmacist review. Over 27 days of auditing in 2018, one pharmacy technician recorded medication related interventions that were encountered/identified throughout a normal working day. The interventions were classified into 7 categories, including wrong drug/strength of a medication administered to a patient, medicine not charted correctly, and patient/family enquiries/concerns.

Results Over 27 days, 59 interventions were recorded. The number of interventions detected ranged between 1 per day (14/27, 51.9%) up to 7 per day (1/27, 3.7%). On the 6 days where there were four or more interventions, 4 of these days followed a weekend where no ward pharmacy technician or clinical service was provided. Identifying inappropriate charting of medicine on drug chart was the most common intervention (18/59; 30.5%), followed by patient/family enquiries (9/59; 15.3%) and identification of wrong drug/strength administered (8/59, 13.6%).

For all interventions, pharmacists were notified. Resultant outcomes included doctor follow-up (10/59; 16.9%) and incident entries (9/59; 15.3%).

Conclusion This study demonstrates the additional benefits of pharmacy technicians in a ward setting by detecting clinical issues before or alongside clinical pharmacist review to enhance the safety and quality of medication provision to patients. Further studies looking at expanded ward technician services including weekends are warranted.

Aim Assess comparative efficacy of itraconazole and nebulised amphotericin (nAmpB) as fungal prophylaxis in heart transplant (HTx) recipients; evaluate calcineurin inhibitor (CNI) level change at itraconazole cessation and associated rejection episodes.

Methods Retrospective review of HTx recipients 4/2012 to 12/2016. From 04/2012–12/2014 fungal prophylaxis was itraconazole 200mg BD for 3 months. From 12/2014–12/2016 this changed to nAmpB 10mg BD until discharge. Primary outcome was fungal infection per EORTC criteria; secondary outcomes were CNI level changes and ISHLT grade ≥2R biopsy-proven rejection at 12–16 weeks post HTx (following itraconazole cessation).

Results 69 patients received itraconazole and 75 nAmpB. There was no difference in invasive fungal infections: 3 (4%) proven, 3 (4%) probable in itraconazole group vs 3 (4%) proven, 2 (3%) probable in nAmpB group (p=0.65).

In the itraconazole group, there were significant reductions in CNI levels despite planned dose increases: mean cyclosporin level dropped by 64% from 267±102 μg/L to 95±44 μg/L (p=0.016) (mean dose increased 74%). Mean tacrolimus level dropped by 60% from 11.1±3.5 μg/L to 4.5±2.3 μg/L (p=0.0001) (mean dose increased 164%).

10 (14%) patients in the itraconazole group experienced ≥2R rejection after itraconazole cessation at 3 months. All had sub-therapeutic CNI levels (tacrolimus <8μg/L or cyclosporin <50μg/L) at this time. In the nAmpB group 3 (4%) patients experienced ≥2R rejection.
Clinical Features A 29-year-old Caucasian male bridged with left-ventricle-assist-device support underwent CTX in October 2010 for dilated cardiomyopathy.

Post CTX clinical course was complicated by several episodes of cellular rejection and recurrent AMR with significant graft dysfunction.

Previous treatments for AMR included multiple cycles of methylprednisolone, plasmapheresis, intravenous immunoglobulin, rituximab, bortezomib, tocilizumab, and splenic irradiation.

In October 2017, the patient was admitted with heart failure symptoms and evidence of graft dysfunction marked by a fall in left ventricular ejection fraction from 55% to 30%.

Interventions, Case Progress and Outcomes Following multi-disciplinary transplant team discussion, eculizumab was proposed as an alternative treatment option for AMR until re-do CTX.

Transplant cardiologist and transplant pharmacist applied to drug and therapeutics committee for eculizumab approval and liaised with manufacturer for procurement and drug information. The pharmacist provided patient, medical and nursing staff education.

Treatment schedule was: 1200mg intravenous infusion day 1; 900mg day 2; 900mg weeks 2, 3, 4; 1200mg week 5; then 1200mg fortnightly thereafter.

Cytomegalovirus, fungal, and meningococcal prophylaxis was commenced. Four inpatient eculizumab doses were administered followed by continued outpatient treatment.

The patient tolerated eculizumab well, with improvement in graft function which was maintained until successful re-do CTX in March 2018.

Conclusion To our knowledge, this case describes the successful use of eculizumab for the first time in treating persistent chronic AMR in an Australian CTX recipient as a bridge to re-do cardiac transplantation.
Clinical

16 THE DEVELOPMENT OF NATIONAL GUIDELINES FOR THE SAFE PRESCRIBING, DISPENSING AND ADMINISTRATION OF CANCER THERAPY

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Aim The national guidelines for the safe delivery of cancer therapy aim to prevent medication errors by standardising the complex process of providing high-risk cancer medicines. The guidelines were revised and updated in 2017.

Methods The methodology followed the format for the ‘Development of web-based clinical practice guidelines on the Wiki-platform’. A working group of medical, pharmacy and nursing disciplines was established. The PICO (Population/Intervention/Comparator/Outcome) technique was applied to define answerable clinical questions for each subject area and a systematic review of the literature was performed. The strength of the literature-based evidence was assessed using the National Health and Medical Research Council rating system for level of evidence and grades of recommendation. Recommendations were developed to answer each clinical question.

Results The guidelines now contain 37 answerable clinical questions. These are organised to address the general principles and processes related to the provision of cancer therapy, followed by individual sections that align sequentially with the roles and responsibilities of the professional groups and the flow of patient care through the prescribing, dispensing and administration process. Supporting evidence, consensus-based recommendations (n=177) and practice points (n=113) are defined for each question.

Conclusion The guidelines are a multidisciplinary collaboration that support evidence-based recommendations for the safe delivery of cancer therapy. They define best practice by using up-to-date literature alongside the expert, consensus opinion of cancer care professionals. The guidelines provide a point of reference for practitioners providing cancer medications and are readily available on a web-based Wiki-platform of a leading national cancer organisation.

17 FLUCYTOSINE FOR TREATMENT OF CRYPTOCOCCUS NEOFORMANS MENINGITIS IN AN OBESE PATIENT AND THERAPEUTIC DRUG MONITORING

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Objective To describe the monitoring and dosing of Flucytosine in combination with other antifungal agents for treatment of Cryptococcus meningitis in an obese patient.

Clinical features A 56-year-old Caucasian male (Weight: 111kg Height: 182cm) under investigation for Leptomeningeal disease of unknown aetiology, admitted to hospital in February 2018 for further investigation.

Investigations Lumbar punctures (LP) taken during admission repeatedly showed high CSF protein, low CSF glucose and raised CSF white cell count. LP at presentation to neighbouring hospital was positive for CSF Cryptococcal antigen and subsequently grew Cryptococcus neoformans var grubii at 24 days incubation. CSF cultures at treating hospital remained negative. Meningeal biopsy had no growth and no fungal elements were seen. HIV serology was negative.

Interventions Patient received 2000mg flucytosine oral 6 hourly adjusted for ideal body weight (77kg) and liposomal Amphotericin B 300mg by intravenous infusion 24 hourly. TDM was completed for flucytosine for which a peak (Dose given 1200 level taken 1350) level returned 62mg/L suggesting that the drug was not reaching toxic concentrations. TDM was only available once weekly from a neighbouring hospital.

Outcomes Patient completed 2 weeks of ‘induction’ therapy with no adverse effects and transitioned to oral flucytosazole for 8 weeks as ‘consolidation’ therapy. Maintenance therapy was initiated, however patient did not continue taking flucytosone maintenance as symptoms did not improve.

Conclusion This case highlighted the importance of individualising therapy in patients utilising pharmacists’ expertise about TDM and TDM for medications not normally tested for.

18 TICK TOCK! STOP THE CLOT: VTE RISK ASSESSMENTS IN AN OLDER PERSONS MENTAL HEALTH WARD

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Aim By March 2018, 100% of all patients in the Older Persons Acute Ward (OPA) will have a Venous Thromboembolism (VTE) Risk Assessment performed on admission.

Background VTE is one of the leading causes of preventable death in Australian hospitals. A literature review revealed a significant link between mental illness, psychotropic medicine use and VTE risk. According to medical records, OPA had a VTE rate of 1.5 per 100 discharges. Despite this, 0% of patients in OPA were having a VTE risk-assessment completed. The NSW Health VTE Risk Assessment Tool was not being utilised as it did not take into account the unique risk factors in mental health (MH) patients.

Methods A group of clinicians from Pharmacy, Medical, Nursing and Clinical Governance formed a team and completed a driver diagram. The team put forward many change ideas, namely the development of a MH-specific VTE risk-assessment tool. The RMO was given the responsibility of completing the risk-
Clinical

PERIOPERATIVE MEDICATION IS THE QUESTION. DEVELOPING A AIM

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within 8 months to July 2018.

guideline and ensuring 90% compliance by developing an evidence-based

Results 100% of all patients in OPA now receive a VTE risk assessment on admission and are treated accordingly.

Conclusion MH patients are often detained under The Mental Health Act and need to be kept safe from preventable harm. The MH-VTE Risk Assessment Tool can be easily applied to any MH ward. This project demonstrated a multidisciplinary approach to improving patient safety and a potential increase in cost-savings.

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21 TO CEASE OR NOT TO CEASE? THAT IS THE QUESTION. DEVELOPING PERIOPERATIVE MEDICATION MANAGEMENT GUIDELINES.

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Aim To eliminate clinical variation in perioperative medication management by developing an evidence-based guideline and ensuring 90% compliance within 8 months to July 2018.

Methods A literature search was completed to assemble evidence on perioperative medication management. This was then developed into a guideline and endorsed by pharmacy, anaesthetics and haematology. Education on the new guideline was provided to anaesthetists and this was displayed in the preadmission clinic. Improvement in performance was measured through a pre and post interventional study utilising retrospective audit of 30 case files pre and post implementation to assess compliance with guidelines.

Results Baseline data prior to commencement of this project showed variation in practice that did not reflect the evidence base in regard to perioperative medication management. The retrospective audit conducted in November 2017 demonstrated that only 53% of patients received correct advice on cessation or continuation of their medications prior to surgery. Post interventional data showed a dramatic improvement with 92% of decisions regarding medicines concordant with the endorsed guidelines.

Conclusion This is an excellent example of how a pharmacy led multidisciplinary project can drive a significant change in practice to improve the care delivered to patients. By having uniformity in medication changes mirroring current evidence in the perioperative setting we can eliminate undue harm and adverse outcomes. This also enables consistent advice to be provided to patients in the preadmission clinic across the range of disciplines.

19 TIMELY ACCESS TO MEDICATIONS – MANDATORY EMERGENCY MEDICATION IMPREST (MEMI)

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Background The Critical Care Advisory Service (CCAS) within a rural NSW Local Health District (LHD) provides clinical advice and inter-facility transfer management of clinical emergencies via telehealth to rural and remote health facilities in 36 geographical locations. 29 facilities across the LHD have no access to onsite pharmacy services or a standardised emergency medication formulary. Consistent and prompt access to emergency medications is a challenge.

Aim To ensure availability of emergency medication upon request by CCAS team, allowing patients to receive the right care at the right time and prevent unnecessary inter-facility transfers.

Methods A working party consisting of physicians, pharmacists, Patient Flow and Rural Health Service Managers was formed to develop a mandatory emergency medication imprest (MEMI), ensuring all health facilities have a minimum quantity of standardised emergency medications available. The MEMI was developed in consultation with a wide network of stakeholders and clinical streams. A procedure was developed for the framework of MEMI and implementation mandated across the LHD.

Results The MEMI has enabled prompt medication administration in clinical emergencies and prevented unnecessary inter-facility transfers. Consequently, this has reduced the cost of patient management and allowed patients to be treated at their local facility. There is cost savings of up to $5,000 for every prevented emergency inter-facility transfer.

Conclusion The MEMI has ensured reliability and availability of emergency medications in all health facilities within the LHD. This has ensured consistent care, equity of access and prevented avoidable inter-facility transfers where definitive care can be provided closer to home.

20 TIMELY ACCESS TO MEDICATIONS – MANDATORY EMERGENCY MEDICATION IMPREST (MEMI)

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Background When the Preadmission Clinic Pharmacist was implemented at a 250-bed, outer metropolitan hospital, there were no local peri-operative medication guidelines in place and advice to patients varied from doctor to doctor. Guidelines from a tertiary hospital were initially utilised, but inconsistent advice from doctors continued due to different specialist opinions and types of surgery performed. In some cases, this lack of consistency made it difficult for pharmacists and nursing staff to identify errors and on occasion resulted in
cancellations of surgery. "It's time" for local guidelines.

**Aim** To develop a site-specific peri-operative medication management guideline informed by local expert opinion and types of surgery performed in the facility.

**Methods** The initial draft was compiled by consulting peri-operative medicines guidelines from multiple hospital sites, researching current literature and reviewing safety notices. The draft has then been distributed to anaesthetists and surgeons of multiple specialties for consultation and approval.

**Results** The guideline has been approved and endorsed by the local Medicines Advisory Committee for publication. It was interesting to note the rationale for recommendations which differed from practices at the tertiary site, including:

- Continuing non-steroidal anti-inflammatory drugs peri-operatively for most surgeries
- Continuing metformin on clear fluid day(s) prior to colonoscopy, and
- Including the local referral pathway to Acute Pain Service for patients on greater than 50mg oral morphine equivalent per day pre-operatively.

**Conclusion** This guideline meets the need for local, multidisciplinary consensus, and provides a much-needed platform to improve the safety and consistency of peri-operative medication management.

**Clinical**

22 TIME EFFICIENCIES WITH THE PAEDIATRIC ASSESSMENT UNIT (PAU) – A PHARMACY PERSPECTIVE

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**Background** The Paediatric Assessment Unit (PAU) was established to streamline the flow of Paediatric patient care at a rural health service to deliver efficient, safe and complete care for Triage Category 3–5 patients. It was established to reduce the load of the Emergency Department (ED) after hours.

**Aim** To provide pharmacy support and develop specific PAU medication imprest allowing appropriate take-home medications to be supplied outside of local pharmacy opening hours.

**Methods** A working group consisting of paediatricians, paediatric nurses, a change manager and a pharmacist was formed to establish the PAU. The pharmacist was responsible in sourcing adequate medication storage solutions for a limited space and assist in developing a special PAU medication imprest. Selected medications (i.e. antibiotics, inhalers and oral corticosteroids) were produced into take-home packs with labels for dispensing by medical officers to facilitate medication supply from the PAU.

**Results** The PAU has saved ED a monthly average of 240 patient management hours and prevented unnecessary admissions. It has allowed for timely access to appropriate medications and ease of providing medications on discharge afterhours. Admissions and readmissions were prevented with the dedicated paediatric staff providing appropriate advice and supply of take-home medications. This has also produced cost savings by preventing admissions due to patients not having access to medications on discharge.

**Conclusion** With dedicated staff and medication setup, the PAU has helped to reduce the ED patient load, allowing for timely and appropriate treatment. The PAU will be cost effective in the long term by preventing avoidable admissions.

23 H. PYLORI ERADICATION: A THERAPY FOR IMMUNE THROMBOCYTOPENIC PURPURA?

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**Objective** To present a case where H.pylori eradication assisted platelet recovery in refractory immune thrombocytopenic purpura (ITP).

**Clinical Features** Our patient is a 42-year-old male with no past medical history. He first presented in December 2017 with fluctuating thrombocytopenia initially attributed to his Truvada® pre-exposure prophylaxis and antibiotics for Mycoplasma genitalium.

**Investigations, Case Progress and Outcomes** In May 2018, after ceasing the suspect antibiotics he was treated with high-dose dexamethasone. Despite this his platelets dropped to 3x10^9/L. In June, after his first rituximab therapy his platelets dropped to 3x10^9/L, and rituximab was commenced. After two more hospital admissions and further treatment with steroids and intravenous immunoglobulin, his platelets remained low. In mid-June, rituximab 100mg weekly was commenced and he was discharged after the first infusion with platelets of 25x10^9/L.

There is a proposed association between H.pylori and ITP. Our patient was screened returning a positive test for serum anti-H.pylori IgG antibodies. We commenced H.pylori triple eradication therapy in June after his first rituximab dose. One week later his platelets had risen to 89x10^9/L. Studies increasingly report improved platelet counts after completing triple eradication therapy. No established mechanism links H.pylori to the pathogenesis of ITP, however several theories attempt to explain this platelet response including the potential immunomodulatory effects of triple eradication therapy. Larger randomised controlled trials are still required in this area.
Conclusion *H. pylori* eradication in ITP patients is a treatment option that may be considered given its low cost and minimal risk of toxicity. *H. pylori* eradication assisted platelet recovery in our refractory patient.

24 EVALUATION OF GLYCAEMIC CONTROL DURING TREATMENT WITH INSULIN INFUSIONS IN CRITICALLY ILL PATIENTS

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Aim To determine the proportion of time that critically ill patients are within the target blood glucose range, according to institutional Intensive Care Unit (ICU) Blood Glucose Management Guidelines.

Methods This retrospective observational cohort study evaluated patients admitted to ICU and commenced on an insulin infusion. Blood glucose levels (BGLs), for the first 72 hours after commencing an insulin infusion, were collected. Each BGL was reviewed and classified into episodes of hypoglycaemia, target range and hyperglycaemia. The primary outcome was the proportion of time spent within the target BGL range (5.1 - 10 mmol/L). Secondary outcomes included the proportion of time spent outside of the target range and adherence with the Guidelines.

Results One hundred and thirty-seven patients were admitted to ICU during the study period, 25.5% were commenced on an insulin infusion (n=33). On average, patients spent 70.6% (±19.8%) of the insulin infusion duration within the target range. There were 31 patients (88.6%) who had a median BGL within the target range. The median BGL, whilst on the insulin infusion, was 8.35 mmol/L (IQR 7.8–9.0 mmol/L).

In total, 810 BGLs were recorded, in response to 63.8% of those BGLs the insulin infusion rate was correctly adjusted as per the guidelines; 70.1% of BGLs were measured at the correct times, as recommended by the guidelines.

Conclusion The vast majority of patients remained within an acceptable target blood glucose range for the majority of time. The results demonstrate that the current BGL management of critically ill patients on an insulin infusion is safe and effective.

25 TIME FOR DOCTORS TO ENGAGE IN QUALITY IMPROVEMENT ON VTE PROPHYLAXIS PRESCRIBING

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Aim To embed a quality improvement curriculum on venous thromboembolism (VTE) prophylaxis into the intern medical officer training curriculum.

Methods An interprofessional team of nursing, pharmacists and doctors were asked to provide a curriculum educating VTE prophylaxis and treatment. The program included didactic teaching, interactive questionnaires, experiential learning, self-reflection and feedback. The content was incrementally designed to address knowledge gaps identified in learning needs analysis. The self-audit was designed to assess and guide their reflection on their prescription of pharmacological and mechanical VTE prophylaxis. The results from the audit was provided back to the prescribers to instigate practice change.

Results The audit reviewed 112 patients. 47% of VTE risk assessments were completed and documented in the appropriate area, 42% were completed but not documented in the appropriate areas and 11% was not completed. Pharmacological prophylaxis was correctly prescribed in 83% of patients and prescribers were able to identify absolute contraindications. However, discrepant mechanical prophylaxis reflections were found and demonstrated the remaining knowledge gap in this area. Evaluations on individual training step revealed an overall satisfaction in addressing training needs and a high level of engagement.

Conclusion Self-reported pharmacological prophylaxis data demonstrated confidence in prescribers. Areas of improvement was found in the documentation of VTE risk assessment and the prescription of mechanical prophylaxis. Further work is needed to address these areas of VTE management.

26 LEECH THERAPY: A ‘HANDY’ WAY TO ANTICOAGULATE

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Background Medicinal leeches, *Hirudo medicinalis*, have been used since ancient Egyptian times for indications ranging from sexually transmitted infections to systemic ailments. In the 1970s, leech therapy was demonstrated to aid in recovery after hand surgery. Leeches secrete hirudin, a compound with anticoagulant properties which can manage venous congestion, relieve pressure from pooling blood and improve perfusion post-surgery. The accepted pharmacological therapy in revascularisation is heparin and aspirin.

Aim To evaluate readmission patterns among revascularisation patients treated with leeches compared to pharmacotherapy.

Methods Using electronic medication records, a retrospective audit was undertaken of patients with revascularisation between Jan 2017 and June 2018. For each patient, the physiological presentation, type of anticoagulation, and treatment duration were recorded. Readmission rates were determined to compare the effectiveness of leech therapy and pharmacotherapy.

Results The audit recorded thirty-five patients who had revascularisation as part of hand surgery during the study period. Twenty-five patients were treated with leech therapy and 10 patients were...
treated with pharmacotherapy. Five of the patients treated with pharmacotherapy required readmission where two treated with leeches required readmission.

Conclusion The leech therapy project illustrates the benefits of using leech therapy for revascularisation in hand medicine. The Local District guidelines have approved the use of this therapy. This audit shows that leech therapy may be more effective in managing venous congestion in revascularisation patients when compared with accepted pharmacological anticoagulation. An opportunity exists to investigate the novel therapy of leeches in other surgical procedures requiring vascular anticoagulation.

**27 PHARMACOKINETIC COMPARISON OF TWO NEONATAL GENTAMICIN REGIMENS: A QUASI-EXPERIMENTAL STUDY**

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**Aim** To describe the effect of a dose and frequency change on the pharmacokinetic profile of gentamicin for the treatment of neonatal sepsis, in the medical and surgical neonatal intensive care unit and special care nursery of a tertiary paediatric hospital.

**Methods** The pre-intervention cohort was administered gentamicin at a dose of 4 mg/kg intravenously 24 to 36-hourly (N_patients) = 230, n(doses) = 1126), and post-intervention cohort received 5 mg/kg intravenously 36 to 48-hourly (N_patients) = 205, n(doses) = 731). The dosing interval was determined by the neonate's gestation. The study compared the results of three pharmacokinetic parameters (area under the concentration-time curve (AUC), peak concentration and trough concentration) calculated using a published neonatal gentamicin Bayesian model.

**Results** There was no significant difference between the AUC (p = 0.13; Mann-Whitney test) and peak concentration between the two cohorts (p = 0.27; Mann-Whitney test). The trough concentration was significantly lower in the post-intervention cohort (p < 0.01; Mann-Whitney test) and analysis of dosing interval adjustment displayed significantly fewer adjustments required in the post-intervention cohort.

**Conclusion** The increased dose with extended dosing interval resulted in no change to the calculated drug exposure, but improved trough concentration. The post-intervention regimen was superior to the pre-intervention regimen as it resulted in improved clearance, and reduced incidence of requiring dose adjustment and the subsequent invasive blood testing and toxicity screening for the neonate.

**28 CLINICAL EFFECTS OF DULOXETINE IN OVERDOSE**

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**Aim** We aimed to investigate the frequency and severity of the clinical effects following duloxetine overdose.

**Methods** We undertook a retrospective review of duloxetine overdoses (>120mg) admitted to a tertiary toxicology unit between March 2007 and January 2017. Demographic information, details of ingestion (dose, co-ingestants), clinical effects, investigations (ECG parameters including QT interval), complications (serotonin toxicity, seizures and cardiovascular effects), and length of stay (LOS) were extracted from medical records.

**Results** There were 48 duloxetine overdoses, median age 38y and 34 (71%) were female. The median dose was 840mg (range: 180–2820mg). Thirteen patients ingested duloxetine alone and the other ingested duloxetine 400mg, desvenlafaxine 2700mg and temazepam 50mg, and also had a seizure. Glasgow coma score (GCS) was < 15 in 20/48 patients (42%) and GCS < 9 in six patients (13%), all co-ingesting other medicines. One patient developed priapism. Median LOS was 16.7h (range: 0.7–33h).

**Conclusion** Duloxetine overdose caused similar clinical effects (serotonin toxicity and cardiovascular effects) in frequency and severity to other serotonin-norepinephrine reuptake inhibitors in overdose, except did not cause seizures. Co-ingestion of other medications resulted in more severe toxicity.

**29 PRESCRIBING CASCADES AND THEIR EFFECT ON PATIENTS; INVESTIGATING INAPPROPRIATE PRESCRIBING IN PEOPLE WITH PARKINSON’S**

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**Aim** 1) Describe the type and frequency of inappropriate medicines prescribed and/or administered to people with Parkinson’s disease during hospital admission. 2) Describe and compare rates of potentially inappropriate medication prescribing in patients who received pharmacist input and those who did not.

**Methods** A discharge diagnosis search identified admissions for patients with Parkinson’s disease between July 2013 and June 2016. A retrospective case note review was conducted to describe and quantify the type and frequency of potentially inappropriate medicines prescribed, and/or administered during...
Conclusion A significant proportion of people with Parkinson's disease are likely to have inappropriate medicines prescribed during hospital admission. Pharmacist involvement appears to contribute to medication safety, by decreasing risk of prescribing and administration of inappropriate medicines, likely improving Parkinson's management during admission.

Results Overall, 230 admissions were reviewed. Potentially inappropriate medicines were prescribed during 14.8% of admissions; 25 of 34 patients prescribed inappropriate medicines had them administered at least once. The most commonly prescribed and administered agent was metoclopramide, with 43 incidents identified. Risperidone, haloperidol and prochlorperazine were among other prescribed inappropriate medicines. Pharmacist review was identified on 68 admissions, with 92.6% of reviewed admissions resulting in no prescribing of inappropriate medicines.

Conclusion This study suggests there may be a role for an outpatient clinical pharmacist review clinic to follow-up patients after hospital discharge to reduce hospital re-admissions.
Aim To assess the incidence of nausea and vomiting in paediatric patients receiving intravenous erwinia asparaginase.

Methods A retrospective single centre audit of patients who received intravenous erwinia asparaginase from 2012 to 2017 was conducted. Case notes were reviewed for the first course of erwinia asparaginase for each patient. Data including the dose, infusion time, concurrent chemotherapy medications and anti-emetics, incidence and severity of nausea and vomiting was obtained.

Results Fourteen patients were identified. Eight patients (57%) had nausea without vomiting from at least one dose of erwinia asparaginase. This included anticipatory (14.3%), immediate (42.9%) and delayed (21.4%) nausea and vomiting. There was no correlation between nausea with or without vomiting and other chemotherapy agents administered concurrently. Ondansetron was prescribed every time only a single anti-emetic was required, however most patients required additional anti-emetics.

Conclusion Nausea and vomiting is a very common side effect of erwinia asparaginase with multiple antiemetics often required. In our cohort 57% of patients experienced vomiting suggesting erwinia asparaginase may be classified as moderately emetogenic. This finding should be validated in other centres and/or prospectively to allow guidelines to be updated to include recommendations for antiemetics for intravenous erwinia asparaginase.
Conclusion Icatibant was used appropriately to treat hereditary angioedema. It was also used for ACE inhibitor induced angioedema which has conflicting evidence of efficacy. We found inappropriate use of icatibant to manage severe allergic reactions highlighting the need for education on icatibant’s mechanism of action and optimal treatment of allergic reactions.

35 A REVIEW OF ASPIRIN ADMINISTRATION IN ACUTE ISCHAEMIC STROKE WITHIN 48 HOURS OF ADMISSION

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Background Stroke is a leading cause of death and disability in Australia, with early intervention critical to patient outcomes. The Australian Stroke Data Tool (AuSDaT) records numerous clinical indicators, including if aspirin is administered to patients with acute ischaemic stroke or transient ischaemic attack (TIA) within 48 hours of admission.

Aim
• To perform a retrospective audit of AuSDaT information to validate the aspirin status of no/unknown
• Describe reasons patients were not prescribed aspirin within 48 hours of admission

Methods From July 1st 2017–December 31st 2017, 208 patients were admitted with ischaemic stroke or TIA, with 26 classified as no/unknown aspirin administration. For the 26 patients, electronic medical records were reviewed to identify if they received aspirin and the time of administration. Reasons for not commencing therapy were recorded to identify areas for improvement.

Results The audit showed 38% of patients listed as no/unknown had received aspirin within 48 hours, while 4% received an alternate antiplatelet, highlighting discrepancies in data recording. A further 15% were rapidly discharged on antiplatelet therapy but not dosed in hospital (mean length of stay 7.5 hours), 8% were transferred to another hospital for endovascular clot retrieval and 23% were palliated. Of the remaining patients, 4% self-discharged and 8% were discharged or transferred to another hospital with an unknown antiplatelet plan.

Conclusion Frequency of interhospital transfers and rapid discharges may be contributing to delayed aspirin administration and documentation. Further validation of the data and how it is classified may assist in future data recording.

36 CAN WE ENGAGE SURGEONS IN ANTIMICROBIAL STEWARDSHIP? EXPERIENCE FROM WEEKLY SURGICAL AMS ROUNDS

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Objectives Antimicrobial stewardship (AMS) programmes traditionally encounter barriers when engaging surgical teams. We initiated weekly surgical AMS rounds (SAMSR) and evaluated participating clinicians’ attitudes.

Methods An AMS team (ID specialist/microbiologist and pharmacist) met weekly with surgical teams (JMOs, registrars, staff specialists and pharmacists).

A 30-item online questionnaire was emailed to SAMSR attendees. The tool (5-point Likert scale and free-text questions) assessed the educational components of the meetings, consistency of advice, attitudes and perceived patient outcomes.

Results 47 responses were included: interns (n=20), residents (n=12), registrars/fellows (n=6), specialists (n=5) and six pharmacists. All participants attended at least one Vascular, Colorectal or Upper GI SAMSR between 2015 and 2018. Each round took on average 30 minutes and was well attended by junior and senior surgical clinicians (88% had a surgical consultant attend).

The majority (n=39/49) thought that the Registrar/Fellow drives antimicrobial prescribing.

Participants agreed that the details presented in SAMSR are sufficient to provide good antibiotic advice. All participants agreed that their knowledge of antibiotics improved, that advice was practical and was frequently followed by the admitting Specialist and that SAMSR have altered their future approach to antibiotic prescribing.

Conclusion Regular AMS chart rounds are valued by surgical teams, are quick and efficient. They enable engagement with prescribers, improve the quality use of antimicrobial agents and can alter attitudes to antibiotic prescribing.

37 AUTOMATED SCREENING OF LOOK-ALIKE, SOUND-ALIKE MEDICINE NAMES FOR SAFETY

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Aim To design and test software to compute similarity of medicine name pairs, with a view to proactively identify look-alike, sound-alike (LASA) medicines and inform update of the National Tall Man Lettering List (the List).
Clinical

Methods Review of international literature identified software used by America’s Food and Drug Administration for screening of proposed medicine names. Australian academic researchers replicated and refined this software to screen all medicines in the Australian Register of Therapeutic Goods (ARTG). Composite LASA similarity scores (0.0000–1.0000) were computed. Collaboration with safety and quality experts enabled two comparisons:

1. Computed scores vs manually calculated scores that had used a different mathematical formula and underpinned development of the 2011 version of the List
2. Computed risk category vs expert consensus risk category that also underpinned the 2011 List.

Results Complete screening of the ARTG identified 7,750 drug pairs with at least moderate (≥0.6600) similarity scores. Examples are primaxin vs primacin (0.9034) and mitomycin vs minomycin (0.9019). The most commonly implicated medicines used the prefix ‘pro-’ and/or suffixes ‘-accord’, ‘-eine’, ‘-ine’ or ‘-en’. Computed scores and resulting risk categories demonstrated significant correlation (p<0.05) with both the manually calculated scores and the expert-consensus risk categories. However, the expert consensus tended to amplify the consequence and significance of the name similarity and safety of LASA medicines.

Conclusion The Australian software demonstrated high sensitivity in identification of potentially confusable LASA medicines, and is recommended to supplement incident reports in the dissemination of safety alerts and application of Tall Man lettering in clinical practice.

38 IT’S TIME TO TRY COLISTIN
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Objective To explore the use of inhaled-colistin in pseudomonas-resistant bronchiectasis.

Clinical Features GH, a 57-year-old female presented with increased purulent sputum and shortness of breath (SOB). GH was afebrile with crackles and decreased air-entry bilaterally. GH is an ex-smoker with COPD, bronchiectasis and pseudomonas colonisation. GH has had ten similar admissions in the preceding 18 months.

Interventions and Outcomes Initial treatment was Tazocin 4.5g QID and tobramycin IV 5mg/kg daily. Two pseudomonas species were isolated, both were resistant to tazocin/ciprofloxacin/meropenem/ceftazidime but sensitive to amikacin/gentamycin/tobramycin. Her GP had, however, isolated a Tazocin-sensitive pseudomonas, thus Tazocin continued.

Azithromycin was added when GH was slow to improve. Little improvement followed and inhaled-colistin 1million-units TDS was trialled. This reduced sputum and improved SOB. GH remained on Tazocin, tobramycin and colistin for a total of 17 days prior to being discharged to continue inhaled-colistin for a further 4 weeks. GH was readmitted after 4 days requiring ICU. She is awaiting sputum cultures and sensitivities to IV colistin and ceftolozane/tazobactam.

Given her ongoing presentations, lung transplantation was discussed and this is to be reviewed in the outpatient setting. The use of azithromycin 250mg daily for inflammation was also discussed to be trialled once there is no acute illness.

Conclusion As demonstrated in this case, inhaled-colistin may have a place in the treatment of refractory bronchiectasis caused by resistant-pseudomonas. Small trials have shown benefit in reducing time to next exacerbation, bacterial sputum density and improving quality-of-life. In this post-antibiotic era the time has come to use our last-line agents such as colistin.

39 ASSESSING THE IMPACT AND FEASIBILITY OF PHARMACIST ATTENDANCE ON POST-TAKE WARD ROUNDS
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Aim To assess the impact and feasibility of pharmacist attendance on Post-Take Ward Rounds (PTWRs) in Internal Medicine.

Methods Senior Pharmacists attended PTWRs over a 7-week period. Data were collected on the number of ward rounds attended, average time spent on the round and per patient, and number and type of interventions/recommendations made by the pharmacist. Feedback was sought from pharmacists and medical staff on their perceptions of the service.

Results Over 7 weeks on 26 PTWRs, 161 patients were reviewed and 358 interventions/recommendations were made. Eleven different types of interventions/recommendations were recorded, with the most common types being recommendations to cease medications (7.8%) or to prescribe regular medications (7.5%). The pharmacist spent 2.8 hours on average on the PTWR, with 6 patients reviewed in this time. Of the medical staff surveyed, 85% would like pharmacists to continue attending PTWRs, with 85% reporting improved patient care and 92% reporting improved communication regarding medications. 86% of pharmacists rated attendance on PTWRs as a valuable learning experience, which improved communication regarding medications (75%) and rapport with the medical team (86%).
Conclusion This study demonstrates the benefits of pharmacist attendance on PTWRs with many interventions/recommendations made at the point of prescribing. Medical staff and pharmacists perceived the service had a positive impact on patient care and team rapport and improved communication regarding medications. Pharmacist time commitment to attend PTWRs was identified as a key barrier to continuation of the service, however, the service has continued through use of pooled departmental resources.

Results Focus group pharmacists described using multiple criteria to determine priority, with the key criteria being reason for admission, complex comorbidities, high-risk medications and renal impairment. A total of 231 pharmacists completed the survey. Criteria prioritised by greater than 80% of respondents included, renal impairment, use of high-risk medications, therapeutic drug monitoring, non-therapeutic INR/APTT, high-risk transfers, older age and comorbidities.

Conclusion Pharmacists described prioritisation as a multifactorial process with a focus on high-risk medications and renal impairment. These findings will inform the development of a predictive risk score to help clinicians with early identification of high-risk patients.

Background Medication harm is experienced by up to 30% of hospitalised patients, of which 7% experience severe harm. More than half of events are thought to be preventable. Pharmacist review can mitigate this harm. However, in increasingly busy hospitals, with high patient throughput, and scarce resources, there is a need to prioritise patients. Current methods to prioritise patients are often cumbersome, include many risk factors and are not well studied.

Aim To determine the key criteria used by pharmacists to prioritise patients in Australian hospitals.

Methods This study used two methods; focus groups and a cross-sectional national survey of Australian hospital pharmacists. Focus groups were used to identify key criteria and perspectives related to prioritisation and were analysed thematically. Criteria identified from focus groups, and a systematic review, were used to design the survey. The survey was distributed nationally via the SHPA’s National Translational Research Collaborative.

Results Focus group pharmacists described using multiple criteria to determine priority, with the key criteria being reason for admission, complex comorbidities, high-risk medications and renal impairment. A total of 231 pharmacists completed the survey. Criteria prioritised by greater than 80% of respondents included, renal impairment, use of high-risk medications, therapeutic drug monitoring, non-therapeutic INR/APTT, high-risk transfers, older age and comorbidities.

Conclusion Pharmacists described prioritisation as a multifactorial process with a focus on high-risk medications and renal impairment. These findings will inform the development of a predictive risk score to help clinicians with early identification of high-risk patients.
progress notes were reviewed via the Electronic Clinical Record Management System to assess compliance of prescribing with AMS restrictions.

Results Compliance with AMS restrictions on IV azithromycin prescribing fell from 50% at baseline to 34% in the post-implementation period. Overall use also increased markedly, from an average of 5 vials per month to 22 vials per month.

Conclusion Allowing greater access to IV azithromycin in ED with reduced direct pharmacist input at point of prescribing led to an increase in overall usage and prescribing non-adherent with AMS restrictions. Prompts built into the computerised imprest system were ineffective as a method of ensuring compliance and reflects the importance of pharmacist input, knowledge and skills, at the point of prescribing. This is paramount even when computerised systems are present.

43 THERAPEUTIC DRUG MONITORING: ARE WE GETTING IT RIGHT AND OPTIMIZING THERAPY?

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Aim To review the Therapeutic Drug Monitoring (TDM) process within an outer metropolitan hospital.

Methods A retrospective audit was conducted on TDM over a 12-month period. Patients were identified using the computerised imprest system if under the age of 18, the test was in an outpatient setting or within the emergency department. The audit, progress notes, medication charts and other relevant pathology were reviewed via the electronic pathology program and via the Electronic Clinical Record Management System. They were assessed for appropriateness of the timing of collection, compliance to local and recommended TDM guidelines, the appropriateness of the action of the resulting pathology and the documented involvement of the pharmacist.

Results There were a total of 3,095 tests included in the study covering 11 medications. Of these, 32.6% were collected at an inappropriate time making interpretation difficult and at a pathology cost of $23,084.86. On average, only 50% of the doses administered to patients after TDM were appropriate based on results and the clinical scenario. There was documented pharmacist advice on the TDM result only 8.6% of the time.

Conclusion TDM has a large impact on the therapy and outcome of patients. This audit showed that TDM is currently performed sub-optimally and with an unknown or ad hoc role of the pharmacist. These preliminary results show a review of the current TDM process is required and with their drug and pharmacokinetic knowledge a greater impact and role of the pharmacist is required.

44 EVALUATION OF AN OBSTETRIC SUBCUTANEOUS INSULIN CHART IN WOMEN WITH GESTATIONAL DIABETES

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Background The in-patient adult subcutaneous insulin chart used at our site did not meet requirements for blood glucose level (BGL) monitoring, blood ketone monitoring or insulin prescription during pregnancy necessitating the development of a specific obstetric chart.

Aim To assess the management of women with Gestational Diabetes (GDM) admitted prior and post implementation of our Obstetric Subcutaneous Insulin Chart.

Methods A retrospective review was performed of 103 medical records of women with GDM admitted for delivery to our service between February 2015 and March 2016. Variables audited included monitoring of Blood glucose levels (BGL) and blood ketone, frequency and safety of insulin prescribing, and frequency of hypoglycaemic and hyperglycaemic events. Continuous variables were compared using t-tests and categorical variables were compared using Fisher’s Exact tests.

Results An increase in insulin chart usage was observed post implementation of the obstetric chart (76.5% vs 98.6%; p<0.001). Documentation of admission BGL (50.0% vs 80.9%; p=0.004) and blood ketone (15.4% vs 47.1%; p=0.005) improved post chart implementation. There was a low rate of intrapartum hyperglycaemia with no significant difference between groups in patients experiencing BGL ≥7.1 mmol/L. No change in incidence of hypoglycaemia was noted with chart implementation (23.1% vs 30.9%; p=0.611). Intrapartum insulin prescribing increased with chart implementation (7.7% vs 29.4%; p=0.030) and overall prescribing of insulin was deemed safe and appropriate.

Conclusion Introduction of an Obstetric Subcutaneous Insulin Chart was associated with increased chart usage and insulin prescription. Documentation of admission BGL and ketones was improved without increased incidence of hypoglycaemia.

45 DOES ELECTRONIC MEDICATION MANAGEMENT SYSTEM (EMMS) SAVE PHARMACISTS’ TIME?

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Aim To quantify how pharmacists utilise their work time and identify changes in their work patterns pre- and post-implementation of eMMS at a tertiary paediatric hospital.
Clinical

Methods Observational time and motion studies were conducted in paediatric medical and surgical wards in September and October 2017 (6 months pre-eMMS implementation) and May and June 2018 (1-month post-eMMS implementation). Pharmacists’ activities for each minute were manually recorded on a paper observation tool and subsequently collated into a spreadsheet for analysis. Time utilised on various tasks, mean task times and number of interruptions were calculated and compared between the two observation periods.

Results 7 pharmacists were observed over 4559 minutes in 2017 while 10 pharmacists were observed over 6651 minutes in 2018. After implementation of eMMS, pharmacists spent less time on direct patient care tasks (52% vs 63%), more on verbal communication (29% vs 22%) and more on non-clinical tasks (19% vs 15%). The mean time required for medication history interviews, discharge reconciliation and discharge counselling remained unchanged. However, time taken to perform admission reconciliation, medication chart review and clinical review was significantly increased. Pharmacists were also interrupted more frequently post eMMS (6.4 vs 4.3 times per hour).

Conclusion The implementation of eMMS has significantly impacted on pharmacists’ work patterns during the transition period (i.e. one month after). They spent less time on direct patient care tasks, took longer to do some clinical tasks and received more interruptions. The study will be repeated again 12 months post eMMS implementation.

46 PILOT AND VALIDATION OF THE SHREED LEARNING STYLES QUESTIONNAIRE FOR PATIENT EDUCATION
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Aim To develop and validate a questionnaire that can be used by healthcare professionals to identify patients preferred learning styles in order to provide tailored education.

Methods The SHReD (Seeing, Hearing, Reading/writing, Doing) Learning Styles Questionnaire was created to identify patient learning styles. Face and content validity were determined using feedback from health education experts. A pilot study was conducted in 40 participants to obtain data for statistical analysis. In the reliability analysis Cronbach’s alpha values were determined to measure the internal consistency of the questionnaire. A regression analysis was performed to detect proportionality between question and chosen learning styles.

Results Expert feedback during face validity identified that the questionnaire was too long and repetitive. Reliability analysis found a high degree of internal consistency with a Cronbach’s alpha value of 0.92. Regression analysis highlighted questions that were under or over measuring particular learning styles. This resulted in the deletion of two questions from the questionnaire. Sixty-five percent of pilot study participants were multimodal learners. Of the unimodal learners, 25% were identified to learn predominantly through doing and none by seeing.

Conclusion The SHReD Learning Styles Questionnaire was developed and validated for assessing patients preferred learning styles. Validity assessment revealed that revision of the questionnaire was required, which resulted in multiple item deletions. The SHReD Learning Styles Questionnaire is now ready to be trialed in a patient population. It is hoped this questionnaire would aid healthcare professionals in providing individualised patient education and potentially improve health outcomes.

47 CHARACTERIZING CAUSES OF MEDICATION RELATED HARM IN A TERTIARY PEDIATRIC HOSPITAL USING A TRIGGER TOOL
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Aim To validate the use of a trigger tool to identify and characterise medication related harm in a paediatric hospital.

Background The Global Trigger Tool was developed by the Institute of Healthcare Improvement to identify patient harm in hospital. There is a modified paediatric tool, however, this has not been validated. Examples of triggers include medications, laboratory values and vital signs.

Methods A published paediatric trigger tool was modified to suit needs. 200 patients with a hospital stay of greater than 48 hours were randomly selected for retrospective chart review. Triggers were detected and associated adverse events (AE) identified. Each AE was confirmed by a secondary reviewer (senior pharmacist, medical consultant). AEs were evaluated for severity, preventability, likelihood for being drug-induced and compliance with organisational reporting. Each trigger was evaluated for positive predictive value (PPV). Identified harm was characterised to allow for development of strategies to mitigate recurrence.

Results 183 patients reviewed revealed 208 triggers (1.14/patient) and 37 AEs (20/100 patients). The PPV of the trigger tool was 17%.
13.5% AEs were deemed preventable. 89% AEs caused temporary harm requiring intervention; remaining 11% resulted in probable initial or prolonged hospitalisation. Nausea and constipation were most frequently identified AEs. Drugs most frequently involved were opioids, cytotoxics and anti-infectives. Organisational reporting procedures were followed for 40% of the reportable AEs.

**Conclusion** The paediatric trigger tool effectively identified adverse drug events for inpatient paediatric population and can be used for identifying medication related harm. Improvements are needed towards reporting of such events.

**49** ANTIBIOTIC MANAGEMENT OF COMMUNITY-ACQUIRED ASPIRATION PNEUMONIA IN THE ICU: HOW MUCH PIPERACILLIN/TAZOBACTAM IS TOO MUCH?

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**Aim** To describe antibiotic prescribing for community-acquired aspiration pneumonia, and characterise the clinical features of patients receiving piperacillin/tazobactam compared with narrower spectrum antibiotics in the Intensive Care Unit (ICU).

**Methods** A retrospective audit was conducted of patients, identified by coding data, with community-acquired aspiration pneumonia who were transferred to ICU and had antibiotics commenced within 48 hours of hospital admission between January 1st to June 30th 2016.

**Results** In total, 47 patients were included. Of these, 26 (55%) received standard therapy, mostly ceftriaxone and metronidazole, and 21 (45%) received broader spectrum therapy, mostly piperacillin/tazobactam.

The two groups were similar with respect to lactate, white cell count, heart rate, respiratory rate, and temperature. Of those who received broader spectrum therapy, 52% required noradrenaline, compared with 35% in the standard therapy group. More than 50% of all patients had chest x-rays that were not consistent with aspiration pneumonia as assessed by a blinded intensivist.

No patients had documented sputum colonisation with resistant organisms, or travel to high-risk areas in the previous 12 months. Other potential sources of sepsis were identified in 38% of patients in each group.

**Conclusion** Almost half of the patients received broad spectrum antibiotic therapy of piperacillin/tazobactam for community acquired aspiration pneumonia in ICU. Those who received broader spectrum therapy did not appear to have a more severe presentation, and no clear reason to explain the antibiotic choice was identified. These results have prompted a multidisciplinary review of the ICU empiric antibiotic recommendations to guide appropriate prescribing of piperacillin/tazobactam.

**50** IT’S TIME TO OPTIMISE DOSING OF UNFRACTIONATED HEPARIN IN OBESE PATIENTS

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**Aim** To determine what maintenance doses of UFH result in a therapeutic APTT in obese patients.

**Methods** A retrospective study of obese patients who were treated with intravenous (IV) UFH between 2015–2018. Medical notes and medication charts were audited and the IV UFH dose infused at the therapeutic APTT was determined (defined as the dose with two consecutive therapeutic APTTs). Patients were categorised into four cohorts based on total body weight (TBW) and doses were compared using the chi-square test.

**Results** 200 patients were identified and 113 met the criteria of having two consecutive therapeutic APTTs. For the four cohorts of <100kg, 100–124.9kg, 125–150kg, and >150kg, the mean ± SD maintenance dose of UFH was 1229 ± 316 Units/hr, 1673 ± 523 Units/hr, 2031 ± 596 Units/hr and 2146 ± 846 Units/hr, respectively. This equated to a mean dose per TBW of 16 ± 4.1 Units/kg/hr, 15.1 ± 4.8 Units/kg/hr, 14.9 ± 4.2 Units/kg/hr and 11.6 ± 4.2 Units/kg/hr, respectively.

Obese patients were significantly more likely to require doses greater than the capped dose compared to non-obese patients (<100kg) (p = 0.0047).

**Conclusion** The current practice of dose capping initial infusion rates in obese patients leads to inadequate dosing. Larger absolute doses (U/Hr) of IV UFH but reduced TBW based doses (U/kg[TBW]/Hr) should be considered in obese patients.
51 UTILISING PRE-DEFINED ORAL SWITCH CRITERIA TO IDENTIFY MISSED INTRAVENOUS TO ORAL ANTIBIOTIC SWITCH OPPORTUNITIES

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Aim i. To develop agreed clinical criteria for intravenous (IV) to oral antibiotic switch that are suitable for bedside use, and ii. To use these criteria to retrospectively identify and quantify missed opportunities for IV to oral antibiotic switch in patients admitted to a general medical unit of an Australian tertiary hospital.

Methods Pre-defined oral switch criteria were developed by an antimicrobial stewardship expert group based on published literature and expert opinion. A retrospective audit of general medical hospital inpatients prescribed IV antibiotics over a one-month period was conducted. Medical progress notes, observation and medication charts and pathology were reviewed each day of IV therapy until switch to oral antibiotics was made. Patients were assessed against pre-defined criteria to determine the number of excess days (if any) of IV antibiotic therapy received.

Results In total, 81 patients were included in the audit. Assessment against oral switch criteria demonstrated 35 patients (43%) received at least one excess day of IV therapy. The most common indication where excess IV therapy was observed was community acquired pneumonia, and the most commonly implicated IV antibiotic was ceftriaxone. The total number of days of excess IV therapy in this cohort was 58 days within one month.

Conclusion Our findings demonstrated there are significant missed opportunities for IV to oral switch. Pre-defined oral switch criteria could be utilised as a tool to implement pharmacist or nurse-led IV to oral antibiotic switch programs.

52 DIRECT ORAL ANTICOAGULANT MONITORING: REAL WORLD UTILISATION OF RIVAROXABAN PLASMA LEVEL MONITORING

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Aim This study investigated the rationale, timing and clinical decisions taken based on rivaroxaban plasma levels in hospitalised adult patients.

Methods A retrospective audit of all rivaroxaban levels at a metropolitan health network between 2015–2018 was undertaken. Electronic medical records, clinical patient notes and pathology data were reviewed for data points; primary indication, dose, rationale for ordering plasma level, level/pathology turn-around-time and result, patient demographics and clinical management outcome.

Results 71 patients with 88 rivaroxaban levels were included [63% male, median age (range) 72 years (25–97)]. Rivaroxaban indications included atrial fibrillation (49%) and venous thromboembolism prevention or treatment (51%). Rationale for ordering plasma levels were pre-operative assessment (28%), compliance (27%), bleeding (25%), overdose (6%) and drug interaction (1%). Rationale was unclear for 13%. In 16 patients (22.5%), resultant levels changed clinical management, most commonly pre-operative assessment (28%), compliance (27%), bleeding (25%), overdose (6%) and drug interaction (1%). Rationale was unclear for 13%. In 16 patients (22.5%), resultant levels changed clinical management, most commonly pre-operative (35%). Levels either reassured clinicians that surgery could proceed (80% of cases) or needed to be delayed (20%). Turn-around-time for results varied with median (interquartile range) 2.9 (1.7–4.6) hours.

Conclusion Rivaroxaban levels resulted in a change of clinical management in 22.5% of patients. Rivaroxaban plasma levels were primarily used to reassure clinicians of clinical management decisions already made. In time critical scenarios results may not be available in time to help guide clinical decision making.

This audit demonstrates rivaroxaban levels may have an important role in patient clinical management, however guidelines are required to direct plasma testing utilisation.
53  SWIFT SWITCH: HEPARIN TO ENOXAPARIN IN A LARGE HAEMODIALYSIS GROUP DUE TO A MEDICINE SHORTAGE

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Aim To facilitate a rapid and safe change in anticoagulant therapy for a large haemodialysis population during a medicine shortage.

Background Anticoagulation is necessary to prevent circulatory clotting during haemodialysis. Heparin was the preferred anticoagulant for a large haemodialysis population of approximately 436 patients. A national heparin shortage in June 2018 necessitated a swift response, including switching to an alternative anticoagulant.

Methods The senior renal pharmacist collaborated with nephrologists to: decide on the best alternative anticoagulant, develop a local protocol based on published evidence, identify suitable patients, and quickly produce prescriptions. Suitable administration records were also required in addition to relevant education for nursing staff.

Results Eighty patients were identified as suitable and switched to enoxaparin with additional patients to be added depending on shortage circumstances. The protocol included initial conservative dosing, dose adjustments dependent on signs of clotting on the dialysis machine and altering administration to the venous injection site. No adverse events related to the switch have been reported. PBS scripts were quickly generated using Excel™, and later entered into the patient clinical information system. Additional benefits included reduced needle-stick injury potential and regain in nursing time. Immediate and relevant education was provided to nursing staff in collaboration with the clinical nurse educator.

Conclusion The safe and quick change in anticoagulation therapy for a large group of dialysis patients was possible due to strong collaboration amongst a multi-disciplinary team. This medicines shortage was a positive catalyst to implement change with a strong potential for long-term benefits.

54  MAKING NURSING IN-SERVICES MORE EFFECTIVE – IT’S TIME!

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Aim Making nursing in-services more effective – It’s Time!

Methods To evaluate effectiveness of short pharmacy delivered nursing in-services using active learning methodologies at a Geriatric Rehabilitation Unit. Initially, we conducted a survey to understand knowledge deficit, constrains to seek medication information, where to find if a medication history that has been documented by a pharmacist, if they knew aspects of Antimicrobial Stewardship which was implemented approximately 18 months prior. Thereafter a series of 10–15 minute interactive lectures were created and delivered by the Pharmacist. These lectures utilised active learning methods. We also compared medication related IIMS data from pre and post implementation of the intervention. Presentations consisted of crossword puzzles, multiple choice questions and solving case based scenarios in groups.

Results There was a 50% increase number of nursing staff being confident about the indication, dose, monitoring required before a dose is given. There was a 9% reduction in reported medication related incidents as compared to the previous year. There was an increase in nursing staff using other clinical resources such as Therapeutic Guidelines and Australian Medicine Handbook other than MIMS.

Conclusion This innovative learning method increased medication awareness among nursing staff. It was very easy to accommodate these in-services in a busy work schedule, as they were short and succinct. They conveyed the most important aspect of the education topic. It also empowered nursing staff to answer medication related queries and escalate to pharmacist or medical officer if further information was needed.

55  A RETROSPECTIVE ANALYSIS OF IV AMOXICILLIN-CLAVULANATE PRESCRIBING IN PATIENTS WITH APPENDICITIS: A TERTIARY HOSPITAL EXPERIENCE

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Aim To determine concordance with intravenous amoxicillin-clavulanate prescribing guidelines, specifically in patients with suspected acute appendicitis. Additionally, to describe adverse events associated with IV amoxicillin-clavulanate in an Australian hospital setting.

Methods A retrospective observational cohort study was performed over a 3-month period at a tertiary referral centre. Utilising ICD-10 codes, patients with acute appendicitis were identified. Baseline characteristics were collected, including demographics, severity of infection, antibiotic therapy details, clinical characteristics and adverse events. Prescribing concordance was assessed using the National Antimicrobial Prescribing Survey [NAPS] appropriateness classification (optimal, adequate, suboptimal, inadequate).

Results We identified 63 courses of IV amoxicillin-clavulanate prescribed for acute appendicitis. The median age was 38, with 55% (34/63) female and a 3.2% (2/63) rate of renal impairment. Appropriate prescribing (optimal and adequate prescribing) was seen in 76% (48/63) of patients prescribed antibiotics. Overall, we demonstrated good
Clinical

concordance with IV amoxicillin-clavulanate prescribing, whereby 90% of antibiotic courses complied with hospital guidelines. Intravenous amoxicillin-clavulanate was well tolerated by patients, with no documented adverse events (clostridium difficile infection, antibiotic allergy or 30-day mortality).

**Conclusion** There was good concordance with IV amoxicillin-clavulanate prescribing guidelines in patients with suspected acute appendicitis, with no adverse events experienced. Currently, further studies are underway to evaluate the safety profile of this mainstay antibiotic in the treatment of acute appendicitis and other conditions. Overall, this study provides useful preliminary data and experience for other hospitals considering introducing this antibiotic to their formulary.

**56 PICC-ING THE PROBLEM – OPTIMIZING ANTIBIOTIC DELIVERY VIA ELASTOMERIC INFUSORS IN PAEDIATRIC CYSTIC FIBROSIS PATIENTS**

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**Aim** Paediatric cystic fibrosis (CF) patients exhibit increased clearance and volume of distribution for beta lactam antibiotics. Novel administration methods, including continuous infusions via elastomeric infusors (EI) can improve efficacy and quality of life. However, there have been inconsistencies in the percentage drug delivered to patients via EI.

This study aims to assess the amount of drug delivered to the patient via EI over the 24-hour period, and to identify contributing factors that hinder this process.

**Methods** A retrospective audit of CF patients that received either piperacillin-
tazobactam (PTZ) or ceftazidime (CAZ) EI over 12 months was performed. The percentage of antibiotic delivered over 24 hours was calculated. Infusors were deemed full functioning if greater than 80% of total dose was delivered.

**Results** A total of 161 patient episodes with 869 infusors were audited. Total of 255 infusors were excluded due to incomplete data recording. 63% of PTZ infusors and 89.6% of CAZ infusors were deemed full functioning. Sub-analysis of the impact of the type of intravenous access device on PTZ infusor showed EI function was reduced when administered via peripheral intravenous cannula or Bioflo(R) peripheral inserted central catheter (PICC). Analysis of PTZ infusor function against drug concentrations showed concentrations exceeding 50mg/L resulted in poor EI function.

**Conclusion** Overall CAZ infusors performed more efficiently compared to PTZ infusors. The type of intravenous access and drug concentration impact significantly on antibiotic delivery via PTZ infusors. Further analysis underway to investigate the impact of percentage of antibiotic dose delivered on lung function in paediatric patients.

**57 A COMPLICATED CASE OF CRYPTOCOCCAL PNEUMONIA IN A RENAL TRANSPLANT PATIENT**

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**Objective** To illustrate the role of the pharmacist and the challenges involved when treating asymptomatic Cryptococcal pneumonia in a renal transplant patient.

**Clinical Features** A 42-year-old female Indigenous renal transplant patient was diagnosed with a Cryptococcal lung infection during a complex admission despite being asymptomatic and discharged against medical advice the next day. She re-presented two weeks later with unrelated symptoms of dyspnoea and radiating chest pain. The patient had a history of recurrent E.coli urinary tract infections and delayed graft function following her transplant four years earlier.

**Interventions, Case Progress and Outcomes** A chest CT and X-Ray revealed an increase in density and local inflammation of a round parenchymal density in the upper left lung. Although the patient was asymptomatic, she was commenced on fluconazole. Her tacrolimus dose was decreased and levels monitored closely.

Eight days after presentation, a follow-up X-Ray illustrated an increase in lesion size. Fluconazole was changed to voriconazole, then to liposomal amphotericin B and flucytosine, despite the latter combination posing risk to the graft. Treatment was further complicated by ongoing hyperglycaemia and hospital acquired pneumonia. The pharmacists contributed to the care of this patient by monitoring for signs of nephrotoxicity, graft rejection, advising on therapeutic drug monitoring, optimising glycaemic control and optimising antimicrobial therapy.

**Conclusion** Pharmacists can contribute to managing complex infections in renal transplant patients by carefully balancing immunosuppressive therapy and graft integrity with safe and effective doses of potentially nephrotoxic medicines.

**58 PHARMACIST-LED THERAPEUTIC DRUG MONITORING: IMPACT OF EDUCATION AND COMPETENCY ASSESSMENT ON PAEDIATRIC PATIENT CARE**

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**Aim** To compare and contrast pre- and post-intervention surveys and case-based assessment to determine whether the online competency-based education...
The response rate of the post-survey was 66% (31/47, n=24 female) with 16 participants excluded for not returning the post-survey on time.

In the study population ranging from newly registered to pharmacists with over 10 years' experience, 80% of participants performed TDM in their current role. Twenty-six participants (84%) assessed their confidence performing TDM post-intervention as ‘somewhat (5)’ to ‘entirely (7)’ comfortable.

The intervention had a major impact on overall paediatric TDM knowledge (d=0.7, p=0.0012) and history taking (d=0.8, p=0.0010). The intervention had a medium impact on accuracy of first dose recommendation (d=0.4, p=0.0938), a small impact on PKPD knowledge (d=0.2, p=0.3372) and TDM recommendation (d=0.1, p=0.6043).

Confidence performing TDM based on 7-point Likert scale increased from a mean value of 4.74 (SD 1.44, 95% CI) pre-intervention, to 5.29 post-intervention (SD 1.69, 95% CI, p-value 0.0089).

Conclusion The TDM education package, in conjunction with clinical experience and mentoring, is likely to improve outcome measures across all 4 domains. Pharmacists’ confidence and competence increased upon completion of the modules, with improvement in some outcome measures.

Methods A user testing questionnaire including literacy assessments was conducted individually for 80 participants at 2 metropolitan hospitals through a face-to-face semi-structured interview. Pharmacy medication labels sourced from different locations were grouped based on components highlighted by the Australian Commission on Safety and Quality in Health Care into 4 different variations (A, B, C and D). Participants were asked to read and demonstrate understanding of the dose and dosage frequency from 1 of the 4 variations (A, B, C or D) of pharmacy medication labels for 4 prescription medications. Twenty participants for each variation were recruited strategically so that demographic characteristics matched between variations.

Results Overall, only 45% of participants were able to correctly understand of the dose and dosage frequency presented on the pharmacy label for all medicines presented. Medication labels with standardised timing (variation B) performed better than other variations with 91.25% of participants able to determine the correct dosage frequency (variation A: 60%, C: 80% and D: 70%). The use of numeric figures was understood by 92.5% of participants compared to the use of capitalised text at 70%. Pharmacy generated medication labels that proposed one step were better understood than instructions that incorporated several steps.

Conclusion The study supports the use of simple, clear and explicit written instructions along with the use of numeric figures in pharmacy-generated medication labels to achieve higher understandability in patients.
observed during collaboration. The provision of smoking cessation information remained similar for both groups at approximately 70%.

Furthermore, approval for use of nicotine inhalers as an added NRT option for these patients was obtained; previously this was unavailable on the hospital formulary.

**Conclusion** The improvements in acceptance, prescribing and utilisation of NRT are expected to have a meaningful effect on patient care. Hospital pharmacists collaboration with Aboriginal & Torres Strait Islander PLOs should be encouraged to improve healthcare delivery.

**61 HIT ANTIPHOSPHOLIPID SYNDROME WITH RIVAROXABAN? NOT SO FAST.**

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**Objective** To present a case of thrombotic complications despite using rivaroxaban for long-term anticoagulation for antiphospholipid syndrome (APS) and subsequent heparin-induced thrombocytopenia (HIT).

**Features** A 53-year-old Caucasian female presented to hospital with fevers, painful, dusky lower limbs and necrotic toes on the background of primary, triple antiphospholipid antibody positive APS. Doppler ultrasound confirmed acute on chronic bilateral limb ischaemia. CT angiography also revealed bilateral adrenal infarction. APS was originally diagnosed in 2015 in context of thrombotic complications and rivaroxaban 20mg daily was commenced at the time.

**Case Progress** Rivaroxaban was changed to therapeutic enoxaparin pre-operatively (D3) then transitioned to a heparin infusion peri-operatively which was ceased after a left below-knee amputation. Prophylactic enoxaparin commenced post-operatively which then increased to a therapeutic dose (D11). The team noted a 50% reduction in platelet count value from baseline (D14) and HIT diagnosis was confirmed by haematology with a luminescence assay. Enoxaparin ceased, and fondaparinux 7.5mg daily was commenced for anticoagulation until thrombocytopenia resolved. Warfarin was re-commenced thereafter as anticoagulation of choice for long-term prevention of thrombosis in APS.

**Conclusion** Rivaroxaban has been proposed as an alternative long-term APS anticoagulation option as it has less burdensome monitoring requirements than warfarin. However, this case adds to safety concerns associated with its use in APS, especially for high risk cases with triple positive antiphospholipid antibody profiles. This case also describes a rare concurrent, and potentially catastrophic, presentation of HIT in APS, and highlights the importance of closely monitoring for it in this population.

**62 DESIGNING A CLINICAL TRIAL FOR THE EVALUATION OF A MEDICINAL CANNABIS PRODUCT IN PERSISTENT PAIN**

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Medicinal Cannabis therapy is now permitted in most Australian states. A major reason given for the use of ‘recreational’ Cannabis is in Persistent Pain.

Despite publications by The American Academy of Sciences evidence supporting treatment is limited and remains controversial. The TGA convened a number of workshops in 2017 to develop guidance on the therapeutic use of Medicinal Cannabis in pain and agreed that this should be in a clinical trial.

The authors have conducted a review on this topic and suggest the following:

- Focus to date has been on Δ-9 tetrahydrocannabinol (THC) whilst cannabidiol (CBD) and the CB2 endocannabinoid system is of greater interest from a pain perspective.
- Neuropathic pain may be the appropriate target of therapy.
- The effect size is likely to be small and the onset of effect delayed.
- Concerns about misuse and diversion of pharmaceutical products must form a major consideration.

The authors suggest:

- A three arm RCT of topical products, flavoured to taint oral or inhaled administration a disincentive to diversional use, containing
  - CBD
  - 50/50 ratio CBD/THC mixture
  - placebo
- Trial performed over at least 12–16 weeks

Large numbers of trial participants will be required. We propose recruitment for chronic low back and knee pain and stratification of pain phenotypes with ‘painDETECT’.

On-line patient recruitment processes would be utilised for assessment and trial monitoring to facilitate recruitment across Australia.

The poster will describe the proposed trial in detail.

**63 QUM PROJECT ON MEDICATION-RELATED BURDEN IN A PERSISTENT PAIN POPULATION**

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**Aim** To audit the medication-related burden experienced by Persistent Pain Patients attending the IPPC.
Methods Clinical notes collected by the Pharmacist during his Medication review were evaluated by a student pharmacist during her QUM placement in the clinic.

The age in years at presentation to the clinic was recorded including the number of medications recorded being taken. Medications were grouped for indications of pain management including a calculated oral Morphine equivalent daily dose, adjuvant analgesics, CAMs, OTC medications and medications taken for co-morbid conditions.

Patients attending the clinic in the previous nine months October 2017 to June 2018 were evaluated.

Results Age groups reflected evidence on the incidence of persistent pain in Queensland

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Incidence</th>
<th>OMEEDD mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>20–29 years</td>
<td>9%</td>
<td>132</td>
</tr>
<tr>
<td>30–39 years</td>
<td>9%</td>
<td>57</td>
</tr>
<tr>
<td>40–49 years</td>
<td>29%</td>
<td>37.2</td>
</tr>
<tr>
<td>50–59 years</td>
<td>25%</td>
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</tr>
<tr>
<td>60–69 years</td>
<td>24%</td>
<td>90.6</td>
</tr>
<tr>
<td>&gt;70 years</td>
<td>4%</td>
<td>110</td>
</tr>
</tbody>
</table>

Data were assessed by age and by age groupings to reflect the expected increase in morbidity with increasing age.

Conclusion Polypharmacy (more than 5 medicines) was noted in 38% and Hyperpolypharmacy (more than 10 medicines) was noted in a further 39%. There was a trend to increasing number of medicines with increasing age (range 1–23).

Half of all medicines being taken were for comorbid conditions, 13% for mental health issues 37% for analgesia (10% for IR opioid, 8% for CR opioids, 6% for antiepileptic pain adjuvants, 3% for tricyclic antidepressants and 9% for paracetamol and NSAIDs).

Analgesic medications accounted for 35% of all poly and hyperpolypharmacy.

64 CONCOMITANT CLOZAPINE AND CHEMOTHERAPY IN A PATIENT WITH SCHIZOPHRENIA AND NEWLY DIAGNOSED BLADDER CANCER

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Objective To report a case of clozapine treatment in a patient undergoing chemotherapy.

Clinical Features A 59-year-old Caucasian male with a history of long-standing paranoid schizophrenia with features of dysthymia and generalised anxiety was newly diagnosed with stage T4 bladder cancer and commenced on a gemcitabine and cisplatin (GemCis) chemotherapy regimen. His paranoid schizophrenia has been stabilised on clozapine for approximately 14 years. While use of these agents with clozapine is not recommended due to the additive risk of agranulocytosis and neutropenia, clozapine was continued with increased monitoring, to avoid a relapse of schizophrenia.

Case Progress and Interventions The patient was referred to mental health hospital in The Home (HiTH), receiving daily home visits for the first two weeks after initiation of GemCis for support and monitoring of mental state. Weekly full blood counts (FBC) were also performed to monitor the patient’s white blood cells (WBC) and neutrophils (N). The Clinical Pharmacist monitored the patient’s blood test results and educated HiTH staff to monitor the patient physically for signs of agranulocytosis. As anticipated, the WBC and N counts trended downwards after initiation of GemCis. Filgrastim was prescribed to boost the patient’s WBC and N, which both began to recover after administration.

Outcomes With the addition of filgrastim and support from HiTH, the patient’s mental state remained stable and his WBC and N counts remained above the threshold for clozapine cessation.

Conclusion With increased monitoring and use of filgrastim, clozapine treatment may be continued concomitantly with chemotherapy.

65 SEVERE HYPOPHOSPHATAEMIA INDUCED BY INTRAVENOUS IRON: ROLE OF THE PHARMACIST IN SEARCHING FOR ALTERNATE TREATMENTS

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Hypophosphataemia is an uncommon adverse effect associated with intravenous iron. This case reports the use of calcitriol to treat a patient with severe hypophosphataemia refractory to intravenous phosphate supplement.

A 72-year-old female with a history of scleroderma and oesophageal strictures requiring frequent oesophageal dilatation presented to hospital with severe vomiting. She also presented with generalised weakness, fatigue, bodyaches and paraesthesia in both hands. Her medical history includes iron deficiency anaemia managed by frequent iron infusions.

Laboratory results revealed severe hypophosphataemia (serum phosphate 0.18mmol/L). Other results were consistent with intravenous iron induced hypophosphataemia mediated by elevated fibroblast growth factor 23 including 1,25-dihydroxyvitamin D deficiency, phosphaturia, hypocalcaemia and elevated parathyroid hormone. Intravenous phosphate replacement (30 mmol/day) did not correct serum levels. The pharmacist performed a literature search to identify alternatives and recommended the use of calcitriol to the treating team. Treatment with calcitriol 0.25 micrograms daily for three days and then twice daily thereafter resulted in a rapid increase in serum phosphate to 0.71mmol/L within five days. Phosphate levels were maintained without the need for further intravenous phosphate replacement. Parathyroid hormone levels also normalised by day 5 of
calcitriol treatment. The patient displayed pronounced improvements in symptoms and was discharged twelve days after calcitriol started.

Severe hypophosphatemia induced by intravenous iron is an uncommon complication and can be refractory to intravenous phosphate replacement. Calcitriol is often effective in correcting hypophosphatemia, particularly in cases refractory to intravenous phosphate replacement. This case highlights the role of the pharmacist to proactively identify alternate treatments.

66 THERAPEUTIC ENOXAPARIN ANTI-FACTOR XA MONITORING: ARE WE DOING ENOUGH? A RETROSPECTIVE ANALYSIS

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Aim To determine the proportion of therapeutic enoxaparin anti-factor Xa (AXA) monitoring performed in patients with a defined indication for monitoring, and to assess the appropriateness of AXA levels drawn and subsequent dose changes.

Methods A retrospective cohort study among inpatients receiving therapeutic enoxaparin at a tertiary referral hospital over one month was performed. Patients were identified via dispensing of ≥60mg enoxaparin syringes however were excluded if treatment duration was <48h. Patient demographics, relevant biochemistry, and enoxaparin prescription details were collected. Potential therapy-related complications (haemorrhage or thromboembolism) were identified from progress notes and discharge summaries. Data were analysed using descriptive statistics (Microsoft® Excel).

Results 80 of 197 (40.6%) patients met inclusion criteria. AXA monitoring was performed on 19 occasions during 15 admission episodes. The proportion of patients who had an indication for AXA monitoring who received monitoring were, according to each criterion: creatinine clearance <50mL/min 26.5% (n=9/34), weight <50kg 25% (n=1/4), weight >100kg 8.3% (n=1/12), treatment duration ≥5 days 25.5% (n=13/51), pregnancy 0% (n=0/1), complication during treatment 33.3% (n=2/6). Inappropriate AXA levels were drawn in 9/19 (47.4%) instances: 3 (33.3%) were not taken at steady-state and 6 (66.7%) were taken outside the 3–5h post-dose window. Dose changes occurred based off inappropriate levels in 4/7 (57.1%) cases.

Conclusion AXA monitoring for therapeutic enoxaparin was not performed in the majority of patients with an indication for monitoring nor drawn appropriately in almost half of cases. The study highlights a role for greater pharmacist intervention to optimise the appropriate utilisation of AXA monitoring.

67 MYCOPHENOLATE MOFETIL: A NOVEL TREATMENT FOR CRYPTOGENIC ORGANISING PNEUMONIA

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Objective Increased understanding of the radiological and pathological processes of Organising Pneumonia (OP) has resulted in a shift to multidisciplinary management. One case series (n=3) has been published that supports the successful use of mycophenolate mofetil (MMF) as an alternative to corticosteroids and cyclophosphamide in the treatment of OP. This case describes the use of MMF in a complex patient who had treatment failure whilst on prednisolone who exhausted current best practice therapies.

Background and Clinical Features An 88-year-old Caucasian male with multiple comorbidities, including Type 2 Diabetes Mellitus, presented multiple times with unresolved pneumonia-like symptoms non-responsive to oral antibiotics. A diagnosis of cryptogenic OP was made via bronchoscopy and a history of multi-lobe consolidation changes on X-ray and CT. He was discharged with a prolonged course of tapering oral prednisolone. Shortly after, he represented with symptomatic hyperglycaemia uncontrolled in a community setting after insulin titration. Treatment with prednisolone was deemed a failure and cyclophosphamide inappropriate given the patient’s age and renal impairment.

Interventions, Case Progress and Outcomes MMF was initiated as a steroid-sparing and immunosuppressive agent. MMF suppresses lymphocyte proliferation via depletion of guanosine nucleotides required for their production ultimately reducing the cytokine driven inflammatory processes characteristic of OP. Treatment was commenced at a dose of 500mg twice daily, basal-bolus insulin was commenced and prednisolone was tapered. Following discharge, he remained stable requiring minimal maintenance steroids.

Conclusion MMF is an emerging alternative to cyclophosphamide as a steroid-sparing and immunosuppressive agent in patients with OP who fail corticosteroid-only therapy.

68 A RARE CASE OF VALPROATE INDUCED ENCEPHALOPATHY

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Objective To report a rare and atypical presentation of valproate induced non-hyperammonaemic encephalopathy.

Clinical Features A 72-year-old female presented to ED with increasingly erratic behaviour, decreased LOC, hypothermia and seizures. Past medical history included bipolar, hyperthyroidism, and a resting tremor. Current medications included omeprazole 20mg, carbimazole 5mg, olanzapine 10mg, and valproate 1g bd with her husband giving additional
500mg doses for her increasingly erratic behaviour.

Case Progress The Patient was intubated and transferred to ICU. On presentation she had an episode of AF with VT and a Torsades De Pointes pattern. CT Brain, MRI brain and lumbar puncture were all unremarkable. EEG showed generalised slow waveform activity consistent with encephalopathy. Valproate level was elevated (107mg/L). Hyperammonaemic encephalopathy was considered but ruled out when the ammonia level returned at 29 micromol/L.

Interventions The pharmacist conducted a literature search and proposed that the presenting symptoms correlated with a valproate induced encephalopathy and there were case reports of this occurring without an elevation in ammonia. Valproate was ceased and carnitine IV supplementation was commenced 3 days later after the patient was slow to wake.

Outcomes The patient was extubated on day 6, 1 day after commencement of carnitine. GCS was 15 and she was transferred to the ward. Carnitine levels returned later and showed a deficiency.

Conclusion This case demonstrates the value of the pharmacist in highlighting atypical medication related causes of admission and appropriate withdrawal of the implicating agent and adequate treatment resulted in a resolution of the symptoms.
Clinical

**Conclusion** The results of this audit demonstrate that insulin requiring diabetics having surgery are managed poorly. Contributing factors include unclear guidelines, poor compliance with guidelines and difficulty prescribing in a digital system. The PAC pharmacist is currently investigating potential improvements including point of care HbA1C testing in PAC, clearer guidelines, education of anaesthetists and decision support incorporated into digital medication management systems.

**Aim** To investigate whether general practitioners (GPs) are routinely provided with information about once-off or intermittent doses of significant medications administered to hospital inpatients.

**Methods** Pharmacy dispensing software data were used to identify inpatients across 5 sites within a 1,816 bed hospital network administered iron polymaltose, denosumab, and zoledronic acid between February and April 2017 and ferric carboxymaltose in April 2017. Scanned medical records were used to assess the quality of information communicated to GPs; namely whether the medication generic or trade name and dose administered was documented in the medical discharge summary (MDS) and pharmacy prepared discharge medication list (DML).

**Results** A total of 627 dispensing records were identified (271 ferric carboxymaltose, 143 iron polymaltose, 50 denosumab, 163 zoledronic acid). Within the 420 available MDS, medication name was documented in 27.7% (51) and dose administered in 24.5% (45).

Non-specific documentation of iron therapy by prescribers as “iron infusion” was identified in 47.2% of iron polymaltose and 26.3% of ferric carboxymaltose records. Iron polymaltose was the least likely medication to be documented by pharmacists within the DML, with only 2 (2.2%) of 91 available records having the medication name and dose listed.

**Conclusion** Pharmacists play a pivotal role in the accuracy of transferred information to GPs. This study demonstrates improvement of communication to GPs is required from hospital doctors and pharmacists for administration of once-off or intermittent medicines administered to inpatients.

**Conclusion** The results of this audit demonstrate that insulin requiring diabetics having surgery are managed poorly. Contributing factors include unclear guidelines, poor compliance with guidelines and difficulty prescribing in a digital system. The PAC pharmacist is currently investigating potential improvements including point of care HbA1C testing in PAC, clearer guidelines, education of anaesthetists and decision support incorporated into digital medication management systems.

**Aim** To implement a strategy to improve the effectiveness of clearing out isolated room medication lockers at discharge to reduce the risk of medication error.

**Methods** An initial audit of 16 isolated room medication lockers was undertaken to assess the number of “Inappropriate Medications” stored in medication lockers. Inappropriate medications were defined as “A medication which has never been prescribed for the patient or which is labelled for another patient”. Nursing education was undertaken and a double-sided laminated sign, which could be attached to the cupboard was implemented on three wards. The signs stated “Medication locker in use” on one side and “Medication locker cleared out and empty” on the reverse. The purpose of the sign was to remind nursing staff to clear out the cupboard when a patient was discharged. Following education and implementation of the signs, a re-audit of the same 16 cupboards was conducted to assess for a reduction in the number of inappropriate medications.

**Results** On initial audit 43% of medication lockers contained an inappropriate medication. On re-audit 25% of medication lockers contained an inappropriate medication. A reduction of 18% in the number of inappropriate medications was observed in the re-audit following education and implementation of the laminated double-sided signs.

**Conclusion** Strategies such as introduction of a laminated sign can reduce the number of inappropriate medications stored in medication cupboards and promote medication safety. Nursing education and reinforcement of the process is required to ensure the strategy remains effective.
Interventions, Case Progress and Outcomes

The patient was transferred to the cardiac catheterisation laboratory for investigation and management. Angiography revealed severe diffuse coronary artery vasospasm affecting all coronary arteries. She was given intracoronary glyceryl trinitrate with good effect.

Following transfer to intensive care unit, the ward pharmacist was consulted to comment on the likelihood of misoprostol causing cardiac events. The pharmacist liaised with both patient and clinic to determine medications administered peri-arrest. They utilised drug-reaction probability scales and case-reports to conclude misoprostol was a probable cause of the cardiac arrest. The reaction was reported to the Therapeutic Goods Administration (TGA).

Conclusion

This case highlights the important role pharmacists play in adverse drug reactions both in the immediate setting and in their reporting to the TGA, ultimately contributing to future patients’ safety. Their consult is regarded with high value in the healthcare team due to their medication expertise and their integral role in investigating medications around the time of significant medical events, such as the case at hand.

Aim

To investigate patient experience of PD management in hospital and assess multidisciplinary awareness of PD medication risks.

Methods

Current acute, sub-acute or Movement Clinic patients with a pre-existing diagnosis of PD and/or their carers were interviewed. Doctors, nurses and pharmacists were interviewed for knowledge of PD medication considerations. Fourteen patients and 112 clinicians were interviewed from two campuses of this health service.

Results

57% of patients reported that they were not asked about their PD medication times on admission, and 21% of patients reported doses being given up to 1.5 hours late. One patient reported adverse effects of delayed administration.

88% of staff were not aware PD medication should be administered within 15 minutes of regular dosing time. Only 4% of nurses were aware that PD medications are time-critical.

Only 38% of staff were aware that antiemetics such as metoclopramide are contraindicated in PD.

77% of staff agreed that a medication chart caution sticker would reduce inappropriate prescribing and administration of dopamine antagonists in PD.

68% of nursing staff thought that handover reminder tools would reduce delayed dosing of PD medicines.

Conclusion

Engaging early with patients, multidisciplinary education, prompts and reminder tools may reduce the risk of avoidable deterioration of patients with PD, improve quality of care and reduce length of stay.

Aim

To determine the proportion of patients admitted to a major tertiary teaching hospital aged 50 years and older with a confirmed neck of femur or vertebral minimal trauma fracture that were commenced on colecalciferol supplementation by discharge, and to report the percentage of patients with serum colecalciferol levels measured.

Methods

In collaboration with orthopaedics, ortho-geriatrics and a university school of pharmacy, assessed at two sites, a sub-analysis of a retrospective audit of electronic medical files for patients admitted with a minimal trauma fracture of the hip or vertebra for 6 months in 2016 was conducted.

Results

A total of 406 patients were screened and 64 patients were found to be eligible for inclusion. Of those eligible, 38 patients were not on any vitamin or mineral supplementation on admission. Of these, 26 patients (68.4%) had their serum colecalciferol levels measured, and 21 patients (55.2%) overall were initiated on colecalciferol. Gender seemed to have little to no influence on colecalciferol prescription with 59% of males and 52% of females initiated on colecalciferol.

Conclusion

Over half of patients with a minimal trauma fracture were commenced on colecalciferol therapy, but a noteworthy proportion of patients remain untreated. Patients with colecalciferol levels are more likely to be initiated on therapy compared to those of whom levels were not taken during admission. This is a missed opportunity for intervention that may place patients at a higher risk of subsequent fracture; therefore effective strategies should be implemented to address this treatment gap in the future.
CASE SERIES; HYPOCALCAEMIA REQUIRING HOSPITALISATION FOLLOWING ADMINISTRATION OF DENOSUMAB IN CHRONIC KIDNEY DISEASE (CKD) PATIENTS

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Objective Denosumab, for the treatment of osteoporosis is used in chronic kidney disease patients. Denosumab can be missed off patient medication records as it is administered six-monthly by the GP. This case series aims to raise awareness of the risk of hospital admission due to hypocalcaemia in this patient subset and highlight the role of the pharmacist in the patient sub-group. Clear documentation of Denosumab administration in a patient’s medical history is important in identifying adverse drug reactions.

SUCCESSFUL TREATMENT OF ADDISIONS DISEASE WITH CONTINUOUS SUBCUTANEOUS HYDROCORTISONE VIA INSULIN PUMP

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Objective To report a successful case of an insulin pump to deliver continuous hydrocortisone for treatment of Addison’s disease (AD), not previously been reported in pediatrics.

Clinical Features The patient, a 17-year-old female suffered from AD, inflammatory bowel disease (IBD), migraine and depression. Medications included oral hydrocortisone replacement, fludrocortisone, mesalazine, topiramate and venlafaxine. Adrenal insufficiency was treated with oral hydrocortisone; however absorption was compromised by the IBD, resulting in cortisol insufficiency, lethargy and joint pain, limiting mobility and stamina and adversely affecting quality of life.

Interventions, Case Progress and Outcomes A trial of subcutaneous hydrocortisone was proposed, using an insulin pump to deliver continuous therapy with small boluses at breakfast and lunchtime. Pump rates were based on data from Swedish patients using the Karolinska hospital protocol. As the pump was reloaded every 3 days, it was impractical to make a compounded product under aseptic conditions. Instead, the pharmacist recommended Solucortef Act-o-vials® to minimize manipulation and subsequent infection risk.

The patient was admitted to hospital for 30 minute sampling of cortisol and ACTH values to optimise pump rates. AddiQoL (Health-related Quality of Life in Addison’s disease), a validated questionnaire was used to show improvement over time.

At 12 months the patient manages the practical aspects of pump therapy well. She remains on hydrocortisone via pump with sustained improvement and dramatically improved quality of life, allowing her to study and work.

Conclusion While there is evidence for continuous subcutaneous hydrocortisone in adults, this case illustrates successful use in adolescents.

SWALLOWING THE COSTS: TIMELY SWITCHING OF PARENTERAL TO ORAL THERAPY

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Background Switching from parenteral to oral formulations can deliver benefits such as reduced drug and consumable costs and minimise steps in drug preparation.

Aim To determine the potential benefits of early intravenous (IV) to oral switching against an established clinical criteria.

Methods A retrospective analysis of all inpatient parenteral orders was conducted using data from automated dispensing cabinets. All withdrawals by nurses between 5am and 10am on a specified day across a 783-bed hospital were reviewed against predetermined clinical criteria to assess if the orders were eligible for conversion from IV to oral. The cost of eligible orders was measured average preparation times by nurses between 5am and 10am on a specified day across a 783-bed hospital were reviewed against predetermined clinical criteria to assess if the orders were eligible for conversion from IV to oral. The cost of eligible orders was compared with the unchanged orders using procurement costs for drug and consumables. A time-in-motion study measured average preparation times by nurses to determine an average time saved for conversions to oral. The sum difference in drug, consumable and time were then extrapolated to an annual benefit using a multiplier of three dosing intervals per day.
Results The most common parenteral preparations eligible for conversion, representing 52% (15) of potential conversions were piperacillin/tazobactam, pantoprazole and paracetamol. The overall cost benefit for all eligible medications and consumables for this time period was $40.88 and $212.85 respectively, extrapolated to an annual benefit of $44,640.96 and $232,432.20. The benefit of nurse time saved was 93 minutes, extrapolated to an annual benefit of approximately 70 days and 14 hours.

Conclusion This study has identified that there are significant medication safety, financial and time benefits to be gained through implementing early IV to oral conversion.

SODIUM NITRITE, NOT YOUR CURE- ALL REMEDY

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Objectives To describe an admission following an intentional overdose with sodium nitrite.

Clinical Features A 52-year-old Caucasian male was transported to hospital via ambulance after being found at home by family unconscious and slumped awkwardly.

He later divulged purchasing sodium nitrite online and self-administering after reading a website dedicated to euthanasia.

Past medical history includes schizophrenia, previously treated with Electro Convulsive Therapy (ECT), obsessive compulsive disorder, depression, hypertension and Bells Palsy.

Case Progress and Intervention Sodium nitrite toxicity results in tissue hypoxia due to production of methaemoglobin. The overdose resulted in worsening cognitive impairment, NSTEMI and acute kidney injury (AKI) due to pigment nephropathy (from rhabdomyolysis and hypotension from his long lie at home) requiring intermittent haemodialysis. He developed a DVT in his right calf, treated with heparin then warfarin.

The pharmacist was consulted to advise on dosing of psychiatric medications in haemodialysis and AKI, and for warfarin counselling. The patient was unable to retain warfarin counselling information on sequential days. The pharmacist raised concerns to the psychiatry and renal teams about his understanding and ability to safely manage warfarin, and risks if another suicide attempt was to occur. The teams had not considered this. It was decided to leave the patient on warfarin whilst he was an inpatient.

The patient transferred to rehab where warfarin was eventually ceased.

Conclusion Sodium nitrite is easily obtained and ingestion can result in tissue hypoxia, which in this patient indirectly resulted in AKI. Pharmacist input can ensure medications are dosed appropriately and safely.

TOBRAMYCIN DOSING IN ADULTS WITH CYSTIC FIBROSIS: BALANCING SAFETY, EFFICACY AND TOLERABILITY

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Background Intravenous (IV) tobramycin is a cornerstone of combination antibiotic regimens employed to treat pulmonary exacerbations in cystic fibrosis (CF). Attempts to minimise cumulative tobramycin toxicity result in conservative dosing strategies, which may reduce treatment efficacy. Serum tobramycin concentration monitoring is mandated, but burdensome to patients.

Tobramycin dosing recommendations aim for peak concentrations (Cmax) 20–40mg/L, 24-hour area-under-the-curve (AUC24) 70–100mg.h/L and trough concentration (Ctough) <0.5mg/L.

Aim i) To determine whether adequate serum tobramycin concentrations are achieved using a dosing regimen which targets 12-hour post dose serum tobramycin concentrations ≤1mg/L; and;

Methods Matched venous and finger-prick blood samples were collected at two time-points on day 7 of therapy from adults with CF receiving IV tobramycin for treatment of a pulmonary exacerbation. The Cmax, AUC and Ctough were calculated using linear regression.

Results 49 treatment episodes from 41 patients were assessed. In 21/49 (43%) episodes Cmax was <20mg/L. In 16/21 (76%) of these episodes AUC24 <70–100mg.h/L. In 6/21 episodes tobramycin dosing was 36-hourly and resulted in AUC36 <105–150mg.h/L. All Ctough were <0.5mg/L.

The Cmax was 20–40mg/L, AUC and Ctough were acceptable based on dosing interval in 17/49 (35%) of treatment episodes.

Bland-Altman plots and correlation analyses showed high levels of agreement between venous and capillary tobramycin concentrations.

Conclusion Tobramycin dosing was considered subtherapeutic in 32/49 (65%) of treatment episodes. High levels of agreement between finger-prick and venous sampling techniques supports the utility of minimally invasive serum tobramycin concentration monitoring.
Clinical

81 CLINICAL EXPERIENCE WITH U-500 CONCENTRATED INSULIN: EFFICACY AND SAFETY

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Aim To describe medication safety strategies implemented to minimise risks associated with concentrated insulin and report the clinical and patient experience with Humulin R U-500® concentrated insulin (U-500) at a tertiary public hospital.

Methods Risk minimisation strategies were devised and implemented by a multidisciplinary team (pharmacy, nursing, and medical) from initial use in 2012. Patients were identified from dispensing records up to May 2018. Quantitative data were collected by retrospective healthcare record review, including medication use, HbA1c, weight and adverse events. Qualitative data on patient experience were assessed through a structured interview.

Results Medication safety initiatives for U-500 were instituted from 2012, including education and alerts for patients, carers and staff, as well as storage, dispensing, prescription and healthcare record strategies. Thirteen patients received U-500 insulin: 54% were male, 12 had type 2 diabetes and 8 were prescribed concurrent hyperglycaemic medication. Characteristics at initiation (mean ±SD) included: age 58±13 years, duration of diabetes 15±11 years, BMI 39 ±7kg/m², HbA1c 10.5 ±1.7% and previous total daily insulin dose 226±73 units. Mean HbA1c improvement was 1.7% at 6 months and 1.8% at 1 year (p<0.01). The mean total daily dose of U-500 at 1 year was 196±77 units and mean weight gain was 3.1 kg. One administration incident was recorded. Qualitative interviews illustrated patients were empowered to be self-advocates in reducing preventable harm.

Conclusion U-500 has been safely used and associated with significant improvement in glycaemia and patient experience. Pharmacists have an integral role in a diabetes service to support this outcome.

82 EVIDENCE FOR ANTIPSYCHOTIC POLYPHARMACY IN REFRACTORY SCHIZOPHRENIA: A LITERATURE REVIEW

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Aim It has been identified there is a gap between current mental health guidelines and clinical practice when using antipsychotic polypharmacy in the treatment of resistant schizophrenia. A literature review was conducted to review the potential benefits versus adverse drug reaction (ADR) burden of antipsychotic polypharmacy (AP) in this population.

Methods Several databases were searched using primary search terms “Schizophrenia” and “Polypharmacy.” A total of 11 randomised controlled trials that met established inclusion criteria were found: nine trials combined clozapine with a second generation antipsychotic (SGA) and two trials evaluated a combination of two SGAs. The improvement on positive and negative symptoms, as well as any ADRs was reviewed.

Results Three trials showed significant improvement of both positive and negative schizophrenic symptoms, but when assessing all 11 trials, improvement in symptoms were not statistically significant. ADRs, primarily metabolic and extrapyramidal side effects (EPS), were also assessed, with two trials reporting hyperprolactinaemia and one reporting elongated QT intervals, however this did not result in significant clinical outcomes when matched with a single antipsychotic comparator.

Conclusion The results obtained indicate that the use of AP for the treatment of refractory schizophrenia does not provide significant benefit in patients who present with partial response to antipsychotic monotherapy. Similarly, there was no significant difference in terms of the risks, and ADR burden, associated with the use of AP. Well-designed randomised controlled trials using standardised psychiatric tools should be implemented in future studies to allow the accurate comparison of data.

83 DULOXETINE AND SEXUAL DISINHIBITION: AN UNRECOGNISED SIDE EFFECT

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Objective To describe the role of the pharmacist in recognising and reporting an unusual adverse drug reaction to duloxetine.

Clinical Features A 68-year-old male patient was admitted to the rehabilitation ward following an episode of Guillain-Barré Syndrome. His previous medical history included morbid obesity, suicidal ideation, hypertensive, gout and reflux. His medication history included mirtazapine, oxycodone-naloxone, paracetamol, pantoprazole and meloxicam. During his admission he was diagnosed with neuropathic pain and was commenced on duloxetine to manage this and his comorbid depression.

Three months after commencing duloxetine the patient developed inappropriate sexualized behaviours towards hospital staff. This included watching pornography, making inappropriate comments to hospital staff particularly when completing toileting cares and inappropriate touching.

Interventions, Case progress and Outcomes No cause could be found for this behaviour, however the timeline fit with the introduction of duloxetine. A trial of cessation was recommended, and
Clinical

after approximately two weeks, the patient’s behaviour diminished significantly.

It was thought these behaviours could be due to a heightened level of impulsivity with the introduction of duloxetine into his regime. There are no reported cases in the literature of sexualized behaviour or impulsivity with duloxetine. The pharmacist completed an ADRAC report and documented an ADR in the clinical record.

Conclusion The pharmacist can play a role in recognising the timeline of patient symptoms and medication changes. Ensuring ADRs are documented in the clinical record, and that the appropriate reports are made to the regulatory authorities can assist in recognising previously unreported adverse effects.

84 STOP THE CLOT: EVALUATION OF APIXABAN USE
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Background Although apixaban is a widely prescribed anticoagulant, safety concerns with its use still exist. Studies suggest that its appropriateness in the clinical setting is suboptimal and concerns with its use still exist. Studies widely prescribed anticoagulant, safety

Methods A 3-month retrospective observational study was conducted at an Australian tertiary referral hospital. Electronic medical records (n=221) were screened for inclusion. Data were collated on patient demographics, apixaban prescribing, whether apixaban was reviewed when clinically indicated and any evidence of bleeding incidents. Information on bleed-related hospital readmissions within one and six months of discharge was collected and the

consequent length of hospital stay calculated. Descriptive statistics were used to analyse the findings.

Results 78 patients were initiated on apixaban in hospital. 22% of apixaban therapy was discordant with guidelines. Five patients experienced a bleeding incident, 20% of which were due to inappropriate apixaban prescribing. 64% of apixaban therapy was reviewed when clinically indicated. More than a quarter of included patients were readmitted into hospital by six months post discharge – 10% of which were due to a bleed. The estimated cost of resulting hospital length of stay was at least $23000.

Conclusion Although the majority of apixaban was concordant with guidelines, inappropriate therapy led to higher rates of bleeding and hospital readmissions. Future studies could explore the pharmacist’s role in optimising apixaban use in hospitals.

85 CLINICAL PHARMACIST INVOLVEMENT IN THE MANAGEMENT OF DISSEMINATED NOCARDIOSIS
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Objective Nocardiosis is an uncommon bacterial infection, often requiring prolonged therapy with multiple antimicrobials. Antibiotic allergies and side effects may complicate management.

Clinical Features A 79-year-old Caucasian male presented with abdominal pain and constipation. Relevant past medical history included non-Hodgkin's Lymphoma, in remission after completing chemotherapy six months earlier. He had also previously experienced an allergy to trimethoprim/sulfamethoxazole (TMP/SMX), resulting in rash, with no features of Steven Johnson's syndrome. In hospital, ataxia and monocular visual disturbance developed. Imaging and tissue cultures were consistent with findings for disseminated Nocardiosis of the lungs and brain.

Interventions, Case Progress and Outcomes Induction therapy was commenced; amikacin 15mg/kg intravenously daily, meropenem 2g intravenously three times daily, and TMP/SMX 320/1600mg orally three times daily. Due to the known allergy, he underwent desensitisation prior to commencing treatment, guided by the Infectious Diseases (ID) pharmacist. Therapeutic drug monitoring (TDM) for amikacin was conducted by the ID pharmacist, and the patient was observed to have adequate exposure and clearance of the medication, with stable renal function. During treatment, the patient developed pancytopenia and folate deficiency, with concern for TMP/SMX contributing in addition to underlying patient factors. Oral folinic acid was recommended by the ID pharmacist to minimise toxicity, with further investigations into underlying aetiology. Audiometric monitoring revealed hearing loss, and amikacin was ceased prematurely, while other antimicrobials were continued.

Conclusion Multiple pharmacy interventions were required to optimize therapy and minimise side effects of antimicrobials. Clinical pharmacists can aid in the management of complex infections, such as disseminated Nocardiosis.

86 INTRAVENOUS (IV) SILDENAFIL FOR PPHN – PRACTICE IMPLICATIONS FOR THE NEONATAL PHARMACIST
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Objective To present a case that demonstrates the effectiveness of IV sildenafil for persistent pulmonary hypertension of the newborn (PPHN) in an extremely premature neonate. PPHN occurs due to increased pulmonary vascular resistance (PVR). Sildenafil reduces PVR by increasing smooth
IV sildenafil, especially in preterm infants. No studies have evaluated the efficacy of IV sildenafil since the early 2000s, yet it is used for PPHN. Oral sildenafil has been used for muscle relaxation in the pulmonary vasculature. Oral sildenafil was successfully used for PPHN in an extremely premature neonate. The neonatal pharmacist monitored sildenafil efficacy and adverse effects, recommended dose adjustments, and provided administration advice, based on the best available evidence. OH's respiratory condition improved with routine care. OH's other medical conditions resolved with routine care. OH remained an inpatient until term gestation.

Conclusion Despite lack of evidence, IV sildenafil was successfully used for PPHN in an extremely premature neonate. The neonatal pharmacist is integral to the care of a patient with PPHN, especially regarding sildenafil dosing, administration, and monitoring.

Interventions, Case Progress and Outcomes 30-50% of neonates do not respond to iNO therapy, thus IV sildenafil was commenced as a continuous infusion of 0.021mg/kg/hour when OH was 15 hours old, according to hospital guidelines. The neonatal pharmacist monitored sildenafil efficacy and adverse effects, recommended dose adjustments, and provided administration advice, based on the best available evidence. OH's respiratory condition improved with routine care. OH's other medical conditions resolved with routine care. OH remained an inpatient until term gestation.

Conclusion Despite lack of evidence, IV sildenafil was successfully used for PPHN in an extremely premature neonate. The neonatal pharmacist monitored sildenafil efficacy and adverse effects, recommended dose adjustments, and provided administration advice, based on the best available evidence. OH's respiratory condition improved with routine care. OH's other medical conditions resolved with routine care. OH remained an inpatient until term gestation.

Introduction The antifibrinolytic agent tranexamic acid (TXA) reduces blood loss and the need for blood transfusions post total knee arthroplasty (TKA). Evidence supports the use of intravenous and/or topical administration of TXA however these methods are invasive and expensive. The use of oral TXA has the potential to provide significant financial savings to healthcare facilities so the aim of this study was to investigate the non-inferiority of an oral TXA regimen to the currently used topical/IV protocol.

Methods This study aimed to recruit 50 participants undergoing TKA. The study group received an oral TXA regimen while the control group received a topical/IV regimen. Primary outcomes were change in haemoglobin levels and blood loss volume. Safety was measured by the incidence of adverse events, in particular the incidence of deep vein thrombosis as measured by a bilateral leg Doppler ultrasound at six weeks post-op.

Results No significant difference in haemoglobin change was found between the groups with mean haemoglobin changes of 32.89g/L and 32.86g/L in the study and control groups respectively. There was no significant difference in total blood loss. No evidence of DVT was found at the six-week ultrasounds.

Conclusion This study demonstrates the non-inferiority of an oral TXA regimen to the currently used topical/IV regimen. In addition, it demonstrates that patient safety is not compromised when using oral TXA over topical/IV. The use of oral TXA in the reduction on blood loss during TKA provides improved convenience for nursing staff and patients and substantial monetary savings for healthcare facilities.

Aim To describe the use of psychotropic medications (antipsychotics and benzodiazepines) in patients with dementia or cognitive impairment admitted to Geriatric Evaluation Medicine (GEM) wards in a large metropolitan hospital.

Methods A retrospective analysis of electronic medical records was conducted on patients who were discharged from GEM wards between 1st January 2016 and 31st December 2016 with a coded diagnosis of dementia or cognitive impairment.

Results A total of 96 patients were analysed. On admission 69 psychotropic orders across 39 patients (40.6%) were prescribed. The majority (71.0%) of these prescriptions were ceased during GEM admission. A total of 27 patients (28.1%) had a new psychotropic prescription during their admission with 16 prescriptions (59.3%) commenced at low doses. Eighteen patients (18.8%) were discharged on a psychotropic with a documented plan for review in the discharge summary in five patients (27.8%). A total of 38 patients received at least one dose of a psychotropic during admission. Of these patients, 12 (31.6%) received more than one psychotropic concurrently within 24 hours. When a STAT or as required dose of psychotropic was administered the indication for and response to administration was recorded in the medical record for 63% and 58.4% of doses respectively. Falls, pneumonia and death occurred more commonly in psychotropic users than non-users.
**Conclusion** Psychotropics in GEM patients with dementia or cognitive impairment are being deprescribed in the majority of cases. However, it’s time to educate on initial dosing, documentation and concurrent use of psychotropics to improve patient safety.

**Aim** To assess nursing attitudes regarding clinical pharmacists’ medication chart annotations in a large teaching hospital.

**Methods** A survey utilising multiple choice and free text questions was electronically distributed to all nursing staff within the hospital to assess utility of chart annotations, potential benefits and to ascertain whether the practice should continue with implementation of electronic medication management.

**Results** 126 nurses from 29 clinical areas with varying levels of experience responded. 93% of nurses surveyed said they refer to pharmacist’s annotations most of the time or always. More than 90% said the information was appropriate and relevant and over 95% of nurses thought it was helpful to their practice.

All nurses (100%) reported pharmacists annotating charts was beneficial. The most popular perceived benefits were: clarifies the order (87%), improves patient safety (84%), ensures prescriptions are safe and correct (73%), and saves nurses time (72%). The most popular aspects of annotation were: clarification of unclear orders (83%), medication chart annotations (79%), and special handling precautions (75%). 67% of nurses thought the fact they knew the pharmacist had reviewed the chart was beneficial. 99% of nurses thought that chart annotation should continue.

**Conclusion** With the increasing demand on a clinical pharmacist’s time, all tasks should be reviewed for sustainability. Chart annotation has been found to be a necessary and important role of clinical pharmacists. The lessons learnt from this survey can be translated into the design and configuration of electronic medicines management solutions.

**Background** Glyceril trinitrate (GTN) patches are often used in the management of severe asymptomatic hypertension (SAHTN) with unknown efficacy and safety. Evaluation of its use can provide data on local management patterns for SAHTN and its effect on patients.

**Aim** To identify clinicians’ approaches to the management of SAHTN and to evaluate the clinical effect of GTN patches on patients, in addition to any other concurrent antihypertensive medications.

**Methods** A survey comprising seven questions was emailed to 112 clinicians covering medical and surgical units. Patients who were prescribed a GTN patch for SAHTN were included in the audit. Patients who were prescribed a GTN patch for any other indications were excluded. Demographics details, antihypertensives used, blood pressure (BP) before and after pharmacological interventions, and any documented adverse events from GTN patches were collected.

**Results** Thirty-six surveys (32.1%) were completed and returned. One third of respondents reported initiating pharmacotherapy when patient’s systolic BP over 170mmHg and asymptomatic. Most participants chose dihydropyridine calcium channel blockers as the first-line therapy.

A total of 131 patients were included in the audit. 53% of patients had a reduction in SPB greater than 25% after receiving a GTN patch. Twelve patients (9.2%) had documented adverse events after treatment with a GTN patch.

**Conclusion** The use of GTN patches for SAHTN resulted in BP reduction outside literature recommendations in more than half of the study population. Further study with a larger study population is required to evaluate the safety of GTN patches for the management of SAHTN.

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molecules and proteins. This may have had an effect on the solubility of asparaginase and resulted in precipitation of the final product.

**Conclusion** Asparaginase is a large modified protein and may precipitate if prepared using a ChemoClave® bag spike due to a potential interaction with the silicone oil-based lubricant. Clinical implications include tissue and vascular damage as well as under-dosing. Intravenous infusions of asparaginase may need to be prepared using needles or an alternative closed drug transfer device such as the BD Phaseal™ system which does not use silicone oil as a lubricant.

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**IN YOUR BEST ENTRESTOS?: A CASE STUDY ON THE USE OF ENTRESTO IN HEART FAILURE**

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**Objectives** Australia’s ageing population comes with an increased prevalence of age-related diseases, including heart failure (HF). Treatment of HF to improve morbidity and mortality consists largely of pharmacological interventions. This treatment regimen has remained constant due to limited new agents, however the recent approval of Entresto (sacubitril/valsartan) in Australia has the potential to significantly change practice. This case study examines the emerging evidence and potential role of Entresto in HF management. Pharmacists can play an important role in the referral of eligible patients to be initiated on Entresto, whilst further assisting in safe titration.

**Interventions, Case Progress and Outcomes** Despite admission for a non-cardiac issue, the pharmacist identified the patients poor LVEF and the Entresto trial at the time. They consequently referred to cardiology and the HF CNC. This ultimately resulted in the commencement of Entresto 24/26mg twice daily. A 12-month follow up found improvements in several laboratory markers including an increased LVEF of 44%. She also improved symptomatically, eliminating palpitations and orthopnoea, with an improved exercise-tolerance and energy level, indicating an enhanced quality of life.

**Conclusion** This case supports the emerging evidence and potential role of Entresto in HF management. Pharmacists can play an important role in the referral of eligible patients to be initiated on Entresto, whilst further assisting in safe titration.

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**HYDROMORPHONE, ARE WE DOING IT RIGHT? (A DRUG USE EVALUATION OF HYDROMORPHONE FOR HOSPITAL INPATIENTS)**

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**Background and Aim** Hydromorphone is a potent opioid analgesic that has been associated with serious patient harms, including death. The aim of this drug use evaluation (DUE) was to evaluate the prevalence and patterns of hydromorphone use in a 1,000-bed tertiary hospital.

**Methods** A retrospective audit of inpatient hydromorphone use was conducted. Patients prescribed with hydromorphone over a two-week period in May 2017 were identified from Schedule 8 register entries across all inpatient wards by a single pharmacist.

**Results** Approximately 9% (n=85) of all hospital inpatients received hydromorphone during the study period. 84% (n=72) of the study population had not previously used hydromorphone and 61% (n=52) were opioid-naïve prior to the initial order.

The most common indications for commencement of hydromorphone were palliative care (46%, n=33), acute musculoskeletal/visceral pain (20% n=14) and pain with associated renal impairment (11% n=8).

Palliative care and geriatric medicine were the main specialties that initiated therapy, collectively providing care to 53% of studied patients. Closer analysis showed that hydromorphone use by these specialties was almost entirely for palliative purposes.

**Conclusion** While use of hydromorphone across the entire hospital was low, given its potency, the relatively high proportion of opioid-naïve patients receiving hydromorphone was of concern. Following this audit, a district-wide multidisciplinary hydromorphone guideline was developed to safeguard its use.

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**VANCOMYCIN DOSE CONVERSION FROM INTERMITTENT TO CONTINUOUS INFUSION**

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**Aim** To determine the effectiveness of dose reduction when converting from intermittent to continuous vancomycin infusion in achieving target spot levels, and to explore the feasibility of developing a dose conversion guidance tool.

**Methods** A retrospective audit of patient health records was undertaken in adult patients discharged to Hospital in the Home (HITH) for continuous vancomycin infusion between January 2015 and
Prevalence and Incidence of Prescription Opioid Analgesic Use in Australia: A Population-Based Study

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Aim To determine the prevalence and incidence of prescription opioid analgesic use in Australia and compare the characteristics of people with and without cancer initiating prescription opioid analgesics.

Methods A population-based cohort study of Australians dispensed prescription opioid study between July 2013 and June 2017 was conducted using data from a random 10% sample of the Pharmaceutical Benefits Scheme data. Poisson regression was used to calculate rate ratios (RR) for opioid prevalence and incidence. Characteristics of people initiating opioids including type of opioid initiated, total oral morphine equivalents dispensed, prescriber specialty, medical comorbidities, past analgesic and benzodiazepine use were compared for people with and without cancer.

Results Opioid prevalence increased (RR=1.006 [95%CI 1.006–1.007]), while incidence decreased (RR=0.977 [95%CI 0.976–0.978]) from 2013/2014 to 2016/2017. There were between 287,677 to 307,772 prevalent users each year. In total, 769,334 adults initiated opioids between 2013/2014–2016/2017 and half of these initiations were by general practitioners. Initiation with a strong opioid occurred in 55.8% of those with cancer and 28.2% of those without cancer.

Conclusion Rates of opioid use have remained high since 2013, with approximately 3 million adults using opioids and over 1.9 million adults initiating opioids each year. Between 2013–2017, opioid prevalence has slightly increased, but incidence has decreased. People without cancer account for the majority of opioid use and are more likely to be initiated on short-acting and weak opioids. Initiation of strong opioids has increased over time, reinforcing concerns about increased use and harms associated with strong opioids in the community.
Clinical

98 IT'S TIME TO REVIEW: CONTRIBUTION OF PRESCRIPTION MEDICATIONS TO EMERGENCY DEPARTMENT OVERDOSE PRESENTATIONS

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Aim
To investigate:
1. Whether legal pharmaceuticals or illicit drugs contribute more to Emergency Department Overdose Presentations (EDOP).
2. Which prescription medications (PM) contribute to EDOP.
3. Whether EDOP due to over-the-counter codeine products have decreased since rescheduling.

Background In the 2016 National Drug Strategy Household Survey, 4.8% of Australians used pharmaceuticals for non-medical purposes in the last 12 months, an increase from 3.8% in 2004. Harmful drug use continues to be a serious public health issue. In 2016 there were 1808 drug induced deaths (DID) in Australia, with 1387 additional deaths where drugs contributed. The current profile of DID is commonly middle-aged males accidentally overdosing on PM.

Methods EDOP for a 12-month period in a large metropolitan hospital were retrospectively analysed for sex, drug and intention. This 12-month period included 7-months prior and 5-months post rescheduling of codeine products.

Results There were 112 EDOP during the 12-month study period, 51 were male and 68% were intentional.

8 EDOP involved illicit drugs, 19 involved alcohol and 97 involved legal pharmaceuticals.

The most common PM class in EDOP were opioids (32) closely followed by antidepressants (30), benzodiazepines (26), anticonvulsants (22) and antipsychotics (19).

Individual drugs in EDOP most often were oxycodone (12), quetiapine (10), diazepam (9) and pregabalin (9).

Codeine was involved in 6 total EDOP, 4 occurred prior to rescheduling.

Conclusion EDOP were far more likely to involve PM then illicit drugs, most commonly oxycodone, quetiapine, diazepam and pregabalin. There has been a modest decrease in presentations involving codeine however further investigation is required to determine the effect of codeine rescheduling on EDOP.

99 THE USE OF KETOCONAZOLE IN SARCOIDOSIS INDUCED HYPERCALCAEMIA

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Objectives Acute and chronic hypercalcaemia can have significant complications for patients and requires prompt treatment. This case highlights the use of ketoconazole for resistant sarcoidosis induced hypercalcaemia, and the role pharmacy played in its safe and appropriate use.

Clinical Features A 54-year-old male was admitted for investigation of potential sarcoidosis and management of hypercalcaemia. His background included type 2 diabetes with multiple complications including chronic kidney disease. His corrected serum calcium on admission was 3.45mmol/L, which remained elevated despite the use of first line options. Therefore, the patient was initiated on ketoconazole 200mg daily.

Interventions/Case Progression Ketoconazole has multiple drug interactions and therefore the pharmacist identified potential interactions prior to its commencement, and provided recommendations to minimise adverse outcomes. The patient was currently using a proton pump inhibitor which has been demonstrated to reduce ketoconazole absorption. As per current recommendations, to aid absorption, the co-administration of an acidic beverage with Ketoconazole was suggested. Despite the traditional use of coke, due to the patient's background of diabetes, the pharmacist researched an alternative acidic beverage with lower sugar content. Despite commencing on 200mg of ketoconazole, the calcium remained elevated above three. Therefore, the pharmacist recommended a dose increase to 400mg, as per researched case reports. This saw the patient's calcium levels return back to normal and this dose continued until discharge.

Conclusion This case outlines the use ketoconazole in treating resistant hypercalcaemia secondary to sarcoidosis and the role pharmacy played in ensuring its safe and effective use.
Clinical

100 ONDANSETRON INDUCED ACUTE CHOREA WITH HYPERTERMIA IN AN OBSTETRIC PATIENT
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Objective To describe a case of a patient that developed extrapyramidal side effects (EPSE), hyperthermia and hypertension after receiving ondansetron a commonly used peri-operative medication.

Clinical Features A 32-year-old female Speech Pathologist of Asian descent developed involuntary facial movements, rigidity, aphasia, hyperthermia and hypertension within one hour of receiving 4mg intravenous (IV) ondansetron after a difficult vaginal birth. Past medical history includes polycystic ovaries and anxiety.

Interventions, Case Progress and Outcomes The severity of the reaction slightly improved after 3 doses of 0.5mg benzatropine IV. Patient had received metoclopramide 17 hours prior to reaction, however as benzatropine had minimal effect and the reaction was more choreiformic in nature, ondansetron was decided to be the likely culprit, as there have been previous reports of ondansetron causing acute chorea in female patients. Background medical history included osteopetrosis, a rare genetic condition which may lead to bone marrow failure, frequent fractures and infections. Symptoms on admission included worsening vision and hearing impairment, anaemia and pancytopenia.

Interventions, Case Progress and Outcomes The medical team decided to trial IFN based on the results of limited overseas paediatric and adult trials and the severity of her symptoms. Pharmacy was involved in dose calculation and organisation of supply. IFN has antimicrobial and antiviral immunomodulatory effects and promotes formation and activation of osteoclasts. Subcutaneous IFN 70 microgram three times weekly was initiated, with the first dose administered in hospital. The patient was discharged after her first dose. 8 weeks post discharge, the patient developed flu-like symptoms and the dose was decreased to 50 micrograms. Her haemoglobin improved during this period.

Conclusion To our knowledge, this is the first reported case describing the off-label use of IFN in osteopetrosis in Australia. It may be a more cost-effective and less invasive option compared to other treatments such as bone marrow transplantation. Long-term outcomes such as reduction in infection risk will need to be explored in the future.

101 OFF-LABEL USE OF INTERFERON GAMMA-1B FOR OSTEOPETROSIS: A CASE REPORT
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Objective To describe the off-label use of interferon gamma-1b (IFN) for osteopetrosis.

Clinical Features A 52-year-old female was transferred to a large teaching hospital with pain and swelling secondary to recurrent mandibular osteomyelitis. Background medical history included osteopetrosis, a rare genetic condition which may lead to bone marrow failure, frequent fractures and infections. Symptoms on admission included worsening vision and hearing impairment, anaemia and pancytopenia.

Interventions, Case Progress and Outcomes The medical team decided to trial IFN based on the results of limited overseas paediatric and adult trials and the severity of her symptoms. Pharmacy was involved in dose calculation and organisation of supply. IFN has antimicrobial and antiviral immunomodulatory effects and promotes formation and activation of osteoclasts. Subcutaneous IFN 70 microgram three times weekly was initiated, with the first dose administered in hospital. The patient was discharged after her first dose. 8 weeks post discharge, the patient developed flu-like symptoms and the dose was decreased to 50 micrograms. Her haemoglobin improved during this period.

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102 DON'T RUSH TO CRUSH: AUDIT OF ROUTINE PRACTICES FOR PATIENTS WITH SWALLOWING DIFFICULTIES
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Aim To assess routine practices against Don't Rush to Crush (DRTC) guidelines, and to address practice gaps through updates of local institutional Clinical Practice Guidelines (CPGs).

Methods An electronic survey was distributed to pharmacists and speech pathologists across a hospital health network over two weeks in June 2018. Questions assessed routine practices for referral process, electronic inpatient medication chart annotations, specifying vehicles to carry crushed medications and communication on discharge for patients with swallowing difficulties. A designated working group was established to review local CPGs.
Aim
Patients suffering DKA. Evidence-based guideline exists as a decision support for clinicians treating diabetes and electrolyte replacement. A state-wide guideline was implemented at a metropolitan, tertiary referral hospital.

Methods
A retrospective chart audit was performed on all DKA admissions over 12 months (January–December 2016). Patients under 16-years-old or those admitted to ICU were excluded. An audit tool was created to collect information on fluid resuscitation, insulin dosing, and discharge education. Data were collected from medication charts, progress notes, and pathology results. Data were collated in Excel and descriptive statistics were used to determine adherence to the pathway.

Results
Forty-two patients were included in the study. Fluid resuscitation with sodium chloride was run concurrently with glucose 10% in only 38% (n=16) of patients in accordance with the state-wide guideline. Over 50% of patients (n=22) had incorrect starting rates of intravenous insulin, with 95% being under-dosed (n=21). Excluding those with insulin pumps, long-acting insulin was prescribed for only 61% of patients on admission (n=22). On discharge, 55% of patients received education from allied-health (n=23).

Conclusion
Adherence to the state-wide DKA management guideline is suboptimal. Multidisciplinary education is necessary to encourage adherence to evidence-based pathways and to better manage this complex, life-threatening condition.

Results
A total of 23 pharmacists and 11 speech pathologists completed the survey. Apart from medium thickness recommendations, practice gaps existed where majority of pharmacists (78%) and speech pathologists (73%) stated they did not routinely specify the type of vehicles, e.g. yoghurt or fruit puree to carry crushed medications. This generally placed nurses in actual practice to select the vehicle whom may not be in the ideal position to recognise food-drug interactions. For electronic medical records there were inconsistent opinions about the standard place to document medication administration instruction for nurses to follow. Responses included adding ‘order comment’ into the individual drug sentence, flagging as attached documents and entering into electronic daily progress notes or nursing handover notes. Medications Management CPGs were updated to reflect practices recommended by the current Australian guidelines.

Conclusion
This study highlighted the need for interprofessional collaboration and updates of local CPGs to reflect best practices for patients with swallowing difficulties.

Results
Aim
To determine if centralising compounding of rituximab to pharmacy rather than outsourcing can deliver a cost saving for a tertiary paediatric hospital.

Methods
Currently the pharmacy dispenses rituximab vials and nursing staff prepare the dose on the ward. Six months of dispensing data were collected and cross referenced against the patient medical records to determine the doses administered and amount of rituximab wasted. A time in motion study was performed with pharmacy and nursing staff to determine the time required to prepare a dose of rituximab. An external compounding service provided a quote to compound and supply the rituximab.

Results
Over six months, 54 doses of rituximab were required, the total drug cost was $103,327 and the cost of nursing staff to prepare all the doses was $403. If pharmacy compounded the rituximab, drug wastage could be eliminated saving $5484 per six months, this figure takes into account the extra cost for pharmacy to compound rituximab compared to nursing staff. Outsourcing rituximab compounding results in a potential $17,133 cost saving over six months, consumable usage would decrease ($1368) and nursing staff time saved ($403). However, there would be an increase in the cost of pharmacy staff time to order and receive the drug.

Conclusion
Outsourcing rituximab compounding to an external provider is the most cost-effective option and could save the hospital an average of $33,000 per year. This initiative would also save nursing time allowing nurses to focus on patient care.
Clinical

Results The Pharmacy identified eleven major areas which needed improvement to comply with the USP797. The following changes in practice were identified and needed addressing:

- validation of handwashing and garbing process
- validation of visual inspection process
- optimisation and validation of sterile environment
- change of expiry dates
- review and update components of staff training
- validation of safe cytotoxic compounding process
- update design of compounding unit
- review and update personal protective equipment
- review and update environmental monitoring program
- equipment maintenance

The costs associated with the changes and optimisation is expected to incur one off costs in pathology $2700, equipment $1200 and staffing $6000. However, the greatest impact is in recurrent yearly expenditure required for pathology $8373, drugs $3718, consumables $2702, operational costs $5220 and staff $10000 per year.

Conclusion Compliance with the Pharmacy Board guidance requires significant investment from the hospital. However, maintaining an onsite aseptic production unit is an essential service for a tertiary hospital and can potentially offer cost saving benefits which may offset the increased costs associated with ensuing compliance.

106 SAY YES TO THE STRESS: PREVALENCE OF EMERGENCY STEROID STRESS PLANS

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Aim To determine the prevalence of patients at a tertiary paediatric hospital at risk of glucocorticoid-induced adrenal insufficiency who are provided with an emergency steroid stress plan.

Methods Pre-existing dispensing and electronic medical record (EMR) data from a 12-month period were used to retrospectively audit patients prescribed Prednisolone liquid and determine whether an emergency plan had been documented. The patient’s admitting team was also recorded. Patients with an Oncology diagnosis or steroid duration less than 21 consecutive days were excluded.

Results From a total of 171 patients, 36% were identified as potentially at risk of adrenal suppression secondary to Prednisolone liquid use (n = 61). Of these patients, 26 (42.6%) had an emergency plan in the EMR. A comparison was made by stratifying patients according to treating teams. Endocrinology 100% [n=1], Gastroenterology 58% [n=19], Neurology 43% [n=14], General Paediatrics 33% [n=6], Nephrology 0% [n=4], where percentage reflects proportion of patients who received an emergency plan and n = number of patients at risk of adrenal suppression. Excluding Endocrinology, absolute number of at-risk patients positively correlated with treating team compliance in providing an emergency plan.

Conclusion The audit demonstrated the prevalence of emergency steroid stress plans over the course of 12 months. Although the sample size was limited, the results suggest that teams with increasing numbers of patients at risk of adrenal suppression are more likely to provide an emergency plan. The audit shed light on a key area for pharmacist intervention around steroid guidelines and stress plan compliance.

107 INVESTIGATING MEDICATION SAFETY CLIMATE IN THE HOSPITAL SETTING TO INFORM MEDICATION SAFETY IMPROVEMENT STRATEGIES

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Aim To measure medication safety climate in a tertiary level Neonatal Unit.

Methods All nursing and medical staff who have worked in the Neonatal Unit for a period of 6 months or more were invited to participate. We administered the Medication Safety Climate Questionnaire in January 2017, which has been previously validated for use in the hospital setting. The questionnaire includes 45 items, with responses obtained on a 5-point Likert scale from Strongly Disagree to Strongly Agree. Responses are grouped into 9 domains, with mean scores converted to a percentage. A score of ≥75% was considered acceptable, with scores below that used to identify areas for improvement.

Results A total of 59 responses were received (response rate 50%). Only 4 domains reached the target of 75%. Key areas for improvement related to perception of management and management support for patient safety and feedback and communication about error. Based on these findings, key medication safety improvement strategies have been developed to improve feedback and communication about medication errors to staff which include running medication safety
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workshops, providing summaries of medication incidents to all hospital staff (rather than just at the executive level) in other staff forums.

Conclusion Pharmacists play a key role in enhancing medication safety culture within clinical units. Measuring medication safety climate provides a valuable opportunity to inform medication safety improvement strategies and measure changes in safety climate over time.

108 CONNECTING DISCHARGE MEDICATION RECORDS, DISCHARGE SUMMARIES AND THE COMMUNITY INTEGRATED MENTAL HEALTH APPLICATION

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Aim Transitions in healthcare are recognized as high-risk points for medication related errors, and timely transfer of accurate medication information is a challenge. Queensland Health pharmacists use the enterprise-wide Liaison Medication System (eLMS) to develop medication lists for patients, or Discharge Medication Records (DMRs). Queensland Health uses Consumer Integrated Mental Health Application (CIMHA) as a state-wide clinical information system for mental health consumers, however there is no current electronic link between eLMS and CIMHA.

Our aims were to establish whether pharmacists uploading DMRs in to CIMHA had an impact on discharge medication records being available on CIMHA, and to compare documentation of discharge medications by medical officers within discharge summaries with DMRs prepared by pharmacists.

Methods Retrospective audits of discharge summaries from mental health wards in 2013 (n =22), 2014 (n = 22) and 2016 (n = 38). Discharge documentation was evaluated to identify discrepancies, which were then risk rated by an expert panel.

Results Previous audits showed only 24% of DMRs being available on CIMHA despite DMRs being created for 78% of consumers. Pharmacist involvement resulted in a 71% increase in DMRs being accessible on CIMHA. Where no DMR was uploaded, 53% of discharge summaries contained discrepancies. Out of the total discrepancies, 21% were risk rated at high or very high risk.

Conclusion Pharmacy involvement resulted in an increase in the availability and accuracy of DMRs on CIMHA. The rate of high-risk discrepancies suggests additional strategies are necessary to ensure reconciliation of information prior to sign-off of discharge summaries.

109 MANAGEMENT OF VANCOMYCIN IN AN ACUTE HOSPITAL – PHARMACIST IMPACT ON THERAPEUTIC DRUG MONITORING (VANCMAN)

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Aim To investigate adherence to vancomycin guidelines, therapeutic drug monitoring (TDM), therapeutic range (TR) attainment and the impact of pharmacists on these parameters.

Methods A single centre, retrospective audit reviewed adults who received vancomycin between 2014–2015. Data were extracted from digital medical records and TDM sheets completed by pharmacists. Adherence to hospital guidelines was analysed for dosing, adjustments for renal function and weight. Pharmacists’ involvement was analysed using chi squared to assess the impact of a pharmacist on guideline adherence and TR attainment.

Results 525 vancomycin courses were reviewed; median duration of vancomycin use was 4 days with a median of two trough levels taken per treatment. Out of 328 patients with recorded body weights, 160 patients had received a loading dose. 46.9% of the loading doses were under-dosed and 5% were overdosed. Initial maintenance doses were under-dosed in 22.2% patients and overdosed in 13.4%. Initial frequency was lower than recommended in 7.6% patients and higher in 21.6% patients. Pharmacist involvement increased the number of levels in TR per patient (0.51 vs 1.13; p<0.001), and the number of appropriately taken levels (1.61 vs. 1.00; p<0.001). Pharmacist involvement was also associated with increased rate of any appropriate level taken during vancomycin therapy from 41% to 77% (p<0.001).

Conclusion This audit identified that there was low adherence to the hospital’s guidelines for vancomycin dosing and TDM. Pharmacist involvement improved TDM and TR attainment. Further research is required to improve guideline adherence to improve therapeutic outcomes and reduce risk of adverse effects.

110 VANCOMYCIN AND PIPERACILLIN-TAZOBACTAM COMBINATION THERAPY – EVALUATING THE RISK OF ACUTE KIDNEY INJURY (SUB-ANALYSIS VANCMAN)

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Aim To evaluate the risk of acute kidney injury (AKI) in patients who receive vancomycin and piperacillin-tazobactam (PIP-TAZ) combination therapy.

Methods Sub-group analysis of the VancMan study; a single centre, retrospective audit of adult patients treated with vancomycin alone and in combination with PIP-TAZ between 2014–2015. Data were extracted from digital medical records and therapeutic drug monitoring sheets completed by clinical pharmacists. Rate of AKI and duration of combination therapy was analysed by chi squared. A logistic regression analysis was completed to control for nephrotoxins, intensive care unit admission, use of inotropes and pre-existing chronic kidney disease.
Results Out of 525 vancomycin courses, that met the inclusion criteria, 211 had PIP-TAZ co-prescribed during the study period. Combination therapy significantly increased the rate of AKI compared to vancomycin use alone (17.5% vs 10.5%, p=0.02). The mean duration of combination therapy was 4 days (1–17 days). Increasing duration of exposure to combination therapy was also associated with a higher incidence of AKI (3.8 days vs 5.2 days, p=0.014). After including all other identified risk factors for AKI in logistic regression analysis, vancomycin and PIP-TAZ combination was still an independent risk factor for AKI (OR 1.73, 95%CI 1.01–2.96, p=0.046).

Conclusion Combined use of Vancomycin and PIP-TAZ, as well as the duration of combination therapy are associated with an increased risk of AKI compared with vancomycin alone. The results are similar to previous literature reports of AKI from the combination. Health practitioners need to be vigilant and limit the exposure as clinically appropriate.

111 COST AND TIME IMPACT OF CANCER CENTRE PATIENT SCREENING MODEL

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Background Clinical screening of patients prior to chemotherapy administration is critical to ensure safe therapy. ‘Day prior’ patient review has advantages for nursing and pharmacy to plan infusion preparation and scheduling but is not always practical for patients who may prefer to be seen the ‘day of’ chemotherapy.

Aim Compare cost and time impact of cancelled chemotherapy between patients screened the ‘day of’ and ‘day prior’ to treatment, and to understand reasons for cancellations.

Methods A ‘returned chemotherapy’ form was developed in collaboration with nursing staff. The chemotherapy cost and preparation time wasted were calculated using hospital databases. Cancellation reasons were categorised into common themes. Data for day prior patients were collected using the pharmacy compounding schedule.

Results 833 cancelled items representing 353 ‘day of’ patients were reviewed.

A recent Chair Audit undertaken by Nursing found that the proportion of ‘day of patients was approximately 30%. Discarded chemotherapy for this group totalled $109,390.98 and incurred 1.3hrs/day of wasted preparation time.

Discarded chemotherapy by cancellation reason included: A. Following patient review ($25,011.64), B. Blood test results ($36,693.07), C. Delayed communication ($26,789.78) and D. Other ($20,696.78).

For the ‘day prior’ group, discarded chemotherapy would have totalled $70,012.95 and incurred 2hrs/day of wasted preparation time if items were cancelled on the ‘day of’ therapy.

Conclusion Scheduling a clinical screening on the day of chemotherapy incurs considerable cost in wasted chemotherapy and preparation time. Cancellation reasons and ‘day prior’ data further support the notion that ‘day of’ scheduling should be minimised to prevent excessive waste.

112 ORAL ANTIBIOTICS IN A SURGICAL SITE INFECTION PREVENTION BUNDLE OF CARE FOR COLORECTAL SURGERY

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Aim To evaluate the impact of adding preoperative oral metronidazole and trimethoprim-sulfamethoxazole on rates of surgical site infections (SSI) following colorectal surgery.

Methods A single-centre retrospective pre and post-implementation audit of 80 patients who underwent colorectal surgery in 2016–2017 was undertaken. The Surgical National Antimicrobial Prescribing Survey was used for data collection. The primary endpoint was rate of SSI within 30 days. Secondary endpoints included rates of other post-surgical infections (e.g. sepsis), TPN requirements and post-op ileus. Statistical calculations, Fisher’s exact test, were calculated using GraphPad™.

Results Each group consisted of 40 patients with similar demographics including average age 60 (range 27–85), majority female (66% vs 50%) (p=0.50) and surgical method laparoscopic or open (40% and 60% pre-implementation vs 30% and 70% post-implementation) (p=0.48).

The primary endpoint of SSI was reduced from 12.5% to 7.5% (p=0.71). Both groups had patients with superficial, organ space and deep incision infections. Secondary endpoints were also reduced in the post-implementation group. The incidence of sepsis was reduced by 20% (12.5% (5/40) vs 32.5% (13/40)) (p=0.06), ileus reduced by 17.5% (5% (2/40) vs 22.5% (9/40)) (p=0.05) and TPN use reduced by 12.5% (7.5% (3/40) vs 20% (8/40)) (p=0.20).

Conclusion Audit findings suggest that the addition of pre-operative oral metronidazole and trimethoprim-sulfamethoxazole can reduce the rate of SSI and post-operative complications commonly associated with infections, but this should be confirmed in a larger cohort.
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Aim To measure the eradication rate of H. pylori salvage therapies (ST) utilised at an Australian hospital including use of moxifloxacin-amoxicillin-proton pump inhibitor (MAP) regimen.

Methods Retrospective cohort study. Cases were identified using pharmacy dispensing records. Data were collected on demographics, treatment details and outcome by reviewing medical records. Primary outcome was eradication of H. pylori defined as a negative urea breath test, stool antigen or gastric biopsy post salvage therapy. Secondary outcomes measured included regimen used, cost and days taken to supply ST.

Results Thirty patients with a total of 37 ST were identified consisting of 20 MAP, 9 Therapeutic Guideline-based regimens (TGST) involving Special Access Scheme agents, and 8 non-approved regimens (NAST). Eradication was achieved in 21 patients, 8 lost to follow-up and 1 declined further treatment. Eradication was achieved in 16 (80%), 4 (44%) and 1 (11%) when MAP, TGST and NAST were used, respectively. Median days (and range) to supply were 0 (0–37), 47 (14–217) and 0 (0–0) respectively. Cost of MAP was 60–75% lower compared to TGST.

Conclusion In this cohort, eradication utilising MAP was comparable to rates reported for TGST in published studies. Significant delays to supply were encountered with TGST likely owing to SAS approval procedures. Non-approved regimens had a low rate of success and could be a focus for antimicrobial stewardship programs in the outpatient setting. MAP may be considered as an alternative option to TGSTs for outpatient- and community-managed ST with the advantage of lower cost and easier accessibility.

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morbid state (all other medications were unchanged). The resident had started to eat normally with no further episodes of refusal of medications or swallowing difficulties. The resident has also become more mobile since ceasing the risperidone.

Conclusion A collaborative relationship fostered through the RMMR program identified and managed a potentially life-threatening adverse drug reaction with timely and successful management within the aged-care environment without need for transfer to hospital.

116 UTILIZATION OF A SPECIALIST HOSPITAL PHARMACIST TO OPTIMISE TREATMENT OUTCOMES FOR PATIENTS WITH HEPATITIS-C

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Background Innovative medication developments for chronic hepatitis-C virus (HCV) led to listing of numerous costly direct acting antiviral (DAA) therapies on the Pharmaceutical Benefits Scheme (PBS) from March 2016.

Treatment success (cure) is determined by patients achieving sustained virological response 12 weeks after treatment (SVR12). A national network (REACH-C) of ten diverse clinical services published its performance. This involved traditional community pharmacy dispensing.

Objectives To review if comparable baseline of patient outcomes exists for DAs. To determine if a specialised pharmacist that complements other multidisciplinary efforts, would improve patient outcomes when compared to national scores.

Methods From 1st March 2016 a specialist hepatitis-C pharmacist performed patient-tailored functions: initial medication review (e.g. drug-drug interactions, counselling); scheduling return visits to encourage adherence, identification and escalation of issues impacting efficacy of DAAs (e.g. new interactions) to multidisciplinary team (MDT); patient-telephone consultations; MDT medication education; ‘just-in-time’ inventory management; intervention documentation.

Results 157 patients were treated with DAAs in 2 years. 52.9% of patients had clinical pharmacy intervention above reinforcement of messages/counselling. Of 132 individuals with known treatment outcomes 129 (97.8%) achieved SVR12 – more favourable than 96.5% of REACH-C results. In fact, all localised results were more favourable compared to REACH-C Results History of past IVDU with SVR12 (98.6% vs 96%); cirrhosis with SVR12 (97.7 vs 93%).

Comparisons with other national outcomes will be presented when published. Further economic analysis is possible.

Conclusion A specialist hospital pharmacy service for complex medications and patients provides more favourable outcomes compared to traditional services.

117 IT’S TIME TO OPTIMISE MEDICATIONS – A PATIENT-CENTRED APPROACH

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Objective Patients with spinal cord injuries can be subjected to long-term complications and it is essential medications are tailored to meet the patients functional capacity in order to improve quality of life.

Clinical Features A C4 tetraplegic male was admitted to the state-wide spinal injuries rehabilitation unit. The patient was transferred from an acute orthopaedic ward on the following medications: Dalteparin, Morphine, Endone, Bisacodyl suppositories, Glycerol suppositories, Docusate and Senna, Pregabalin, and Paracetamol.

Interventions During attendance at a consultant ward round, the Pharmacist recommended the following medication adjustments in order to optimise the patients treatment:

• Optimise pain: Cease Morphone and commence Targin to reduce opioid-induced constipation which may effect the patients bowel regime

• Optimise bowel therapy: Cease suppositories and commence Microlax enemas as the patient was interested in performing his own bowel regime, separate Docusate and Senna to ensure stimulant effects of Senna occurred inline with an upper motor neuron regime

• What about stress ulcer prophylaxis?: addition of Pantoprazole recommended as patients may remain in spinal shock for an extended period of time requiring a minimum of six weeks treatment post initial injury.

Conclusion All recommendations were agreed with by the treating team and implemented. Medication optimisation provides a patient-centred approach to healthcare and ensures patients receive the best possible outcomes from prescribed medications. A collaborative approach with physicians ensured this patient was involved in his medication plan and empowered him to take ownership of his treatment. It’s time for Pharmacists to step up on ward rounds!

118 THE EVALUATION OF HYPERHYDRATION FOR HIGH DOSE MELPHALAN IN STEM CELL TRANSPLANTATION

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Aim To evaluate the benefits and adverse effects of hyperhydration given with high dose melphalan (HDM) in haematopoietic stem cell transplantation (HSCT).
Clinical

### Methods
It was a retrospective cohort study comparing patients’ outcomes between institutes using hyperhydration and not using hyperhydration. A chart review was performed on HDL autologous HSCT patients with myeloma between 2015 and 2017 at two different hospitals in Australia with similar in-patient treatment except the amount of fluid administered with melphalan (6L vs 2L). Patients’ demography, daily creatinine (Cr), daily weight, fluid overload (O/L), acute pulmonary oedema (APO), sepsis and antibiotic use were collected. Data were analysed using Student t-test or Fisher’s exact test.

### Results
The total sample was 88: 54 patients with hyperhydration and 34 patients without hyperhydration. Patients’ demography and baseline Cr were comparable. Mild acute kidney injury (Cr of 1.5–1.9 times baseline or 26 micromol/L increase) was observed in 6/54 patients (11%) and 2/34 patients (6%) with and without hyperhydration respectively (p=0.48). The change in Cr from baseline (maximum Cr / baseline Cr) was larger in the hyperhydration cohort (1.14 vs 1.03, p<0.01). In the observation period, 5/54 patients with hyperhydration (9%) and 2/34 patients without hyperhydration (6%) experienced clinical O/L (p=0.7). There was no record of APO in either group. The early weight gain was larger in hyperhydration cohort but not significantly (1.79kg vs 1.15kg, p=0.09).

### Conclusion
Hyperhydration (6L) did not show benefits nor adverse effects compared to the normal hydration (2L). It appears hyperhydration is not required with HDL.

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1. **RETROSPECTIVE AUDIT OF CRITICAL MISSED MEDICATION DOSES BEFORE ELECTRONIC MEDICATION ADMINISTRATION IMPLEMENTATION**

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**Aim**
To obtain a baseline percentage of preventable missed medication doses (focusing on time critical medications) to compare before & after Cerner (Electronic Medical Record System) is rolled out.

**Methods**
A retrospective audit was conducted of existing medication charts on BOSSnet to determine the number of preventable dose omissions at a major public provider of acute health services in Victoria. An adapted version of the VicTAG Missed Medications tool was used. Eligible patients were randomly selected, total doses were counted and number and type of missed doses were recorded. The audit focused on time critical medications (“critical medications”), medications that are “at a greater risk of causing harm if not administered in a timely manner”.

**Inclusion/exclusion criteria**
- Included: Patients admitted for a minimum of 24 hours on wards covering 3 campuses
- Excluded: Intensive Care Unit (already using electronic medication administration), Emergency, Emergency Observation Unit, Pregnancy Care Centre and Birthing, day stay patients.

**Sample size and time period:**
- 30% of each ward bed list for the randomly selected date, i.e. 248 patients
- 1st of October 2016 to 31st September 2017

A maximum of 7 days per patient were counted, excluding the date of admission and date of discharge.

1.7% of doses (n=234) were missed from the total number of doses audited (n=13,835). From the doses that were missed (n=234), 15.8% were time critical medications (n=37).

**Results and Conclusion**
These audit results will provide useful baseline values for future medication safety audits.

120 **OPIOID RELATED ADVERSE EVENTS (ORADES) – USING DATA TO FACILITATE PHARMACIST INTERVENTIONS**

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**Aim**
To analyse ICD10-AM clinical coded data occurring in a metropolitan LHD to enable focused pharmacist education to optimise clinical interventions in opioid related therapy.

**Methods**
A retrospective analysis of ORADEs occurring in three hospitals from July 2016 – November 2017 was undertaken utilising ICD-10 codes: Y45.0, X42, and T40.2. Using concomitant diagnostic codes, the incidence of known ORADEs was determined. ORADEs were linked to individual opioids administered during inpatient admission using electronic medication management system (eMM). Three 60 minute interactive education sessions were developed and delivered to pharmacists. Analysis for opioid related clinical pharmacy interventions from September 2017 to March 2018 was then performed.

**Results**
776 patients were coded for an ORADE with constipation being the most common (29%), followed by nausea and vomiting (22.7%) and somnolence (17.2%). Two or more ORADEs were...
coded for 42% of patients, three or more for 27%.

78 inpatient records were linked with opioid administration via eMM: oxycodone was the most commonly administered opioid (77%), followed by morphine (22%) and hydromorphone (13%). Constipation was the most commonly implicated ORADE (33%), with oxycodone and naloxone (Targin) formulation contributing to 23% of constipation incidents.

Of 4382 interventions, 203 (4.6%) were opioid related. Interventions increased from 3.1% (n=225) in September to 10.2% (n=786) in March. Qualitative review of interventions identified the following themes: addition of stimulant laxatives to regular opioid use and recommendations for opioid de-escalation on discharge.

**Conclusion** Clinical coded data when linked with medication administration records can be examined to identify trends and prioritise education.

121 THE TRUTH IS OUT THERE: A CASE REPORT OF FLUCYTOSINE TOXICITY IN A HAEMODIALYSIS PATIENT

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**Objective** To describe a case report of flucytosine toxicity despite following published dosing recommendations.

**Clinical Features** A 65-year-old, 70kg, Caucasian female was admitted to the intensive care unit (ICU) with cryptococcal meningitis. Background history included haemodialysis-dependent chronic renal failure secondary to atypical haemolytic uraemic syndrome (aHUS) which was treated with eculizumab.

**Interventions, Case Progress and Outcomes** The patient was commenced on flucytosine IV 37.5 mg/kg (2.5 g) daily (dose adjusted for renal impairment and haemodialysis) for the treatment of cryptococcal meningitis. At least 6 common references and local guidelines were used to support this dose. Therapeutic Drug monitoring (TDM) was not available onsite and could only be conducted once a week leading to a delay in obtaining results. Trough levels were reported in the range of 55.5–164 mg/L (normal range 25–50 mg/L). Peak levels ranged from 128–234 mg/L, above the threshold for toxicity (100 mg/L). The patient exhibited clinical signs of flucytosine toxicity after 7 doses with central nervous system toxicity, flucytosine was subsequently withheld.

A wider review of the literature and references was conducted. The review supported the dosing of flucytosine on haemodialysis days only and the dose was changed to 25 mg/kg (1.7g) post haemodialysis on haemodialysis days only.

**Conclusion** Incorrect or ambiguous reference texts and literature can be incorporated into commonly used medicines information resources. Readily available and timely TDM, critical thinking, and expert knowledge of pharmacokinetics are vital to identify potential discrepancies in resources and facilitate appropriate dosing of medications.

122 ADRENAL INSUFFICIENCY? FEAR NOT! – A STEP-BY-STEP CHECKLIST FOR PHARMACISTS

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**Aim** To provide pharmacists with structured resources to facilitate optimal support for patients with adrenal insufficiency upon admission and before discharge.

**Methods** A delayed patient discharge highlighted an opportunity to standardise pharmacist support to patients with adrenal insufficiency. A multidisciplinary group (pharmacists, clinical nurse consultant (CNC) and endocrinologist) was convened to consider the role of the pharmacist and the resources required to support the patient at admission and discharge. Patient support groups were contacted to obtain resources for post-discharge patient self-care.

**Results** A checklist was developed for pharmacists and its key action items included: initial identification of patients with a history or new diagnosis of adrenal insufficiency, ensuring appropriate treatment is underway, confirming involvement of the Endocrine team, timely liaison about discharge plans, providing necessary medication and patient counselling, as well as issuing patient-friendly discharge kits. These kits include all consumables needed to administer emergency corticosteroid, medicine information and referral to patient support groups. Consumer injectable corticosteroid vials were acquired to facilitate education and provide on discharge.

The checklist and kits were presented to Endocrine staff specialists, CNC and pharmacists who provided feedback for further improvement on the access and applicability of the tools. The checklist was endorsed by the hospital Drug and Therapeutics Committee and made available on the organisation's intranet while the kits were available in the dispensary.

**Conclusion** Adrenal insufficiency is an uncommon but potentially life-threatening condition. The checklist aids pharmacists to facilitate prompt inpatient management and self-care post-discharge to minimise misadventure.
**Clinical**

123 CAN YOU TEACH OLD DRUGS NEW TRICKS? A CASE OF NITAZOXANIDE FOR HUMAN PARAINFLUENZA 3

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**Aim** To describe the use of nitazoxanide in the treatment of human parainfluenza 3 in a critically ill patient.

**Clinical Features** Patient JH, a 60-year-old female of Korean background, was admitted to a large teaching hospital for an influenza-induced exacerbation of asthma. Other comorbidities included type 2 diabetes and obesity. After rapid deterioration and development of respiratory failure, she was admitted into the intensive care unit for intubation and mechanical ventilation.

**Interventions, Case Progress and Outcomes** CT scans indicated tracheobronchitis and bronchial lavage tests (BAL) revealed the presence of human parainfluenza 3. After three weeks of maximal bronchodilator and antibiotic therapy, a collaborative decision between the infectious diseases and intensive care team was made to trial nitazoxanide, originally developed and registered to treat protozoal infections. Based on limited evidence, a dose of 600mg twice a day for 5 days was used off-label to treat the primary viral cause of the patient’s condition. A powder for suspension was procured by pharmacy to facilitate nasogastric administration. After completion of the course, a repeat BAL did not detect any human parainfluenza 3 in the sample.

Despite clearing the virus, the patient’s condition only improved marginally and ultimately JH did not survive.

**Conclusion** This case report demonstrates, to our knowledge, the first documented use of nitazoxanide in an Australian tertiary hospital for treatment of human parainfluenza 3. This example supports potential use of a 5-day course in clearing human parainfluenza 3, however, further cases are warranted to support efficacy.

124 SALVAGE OF VENOUS CONGESTED FREE FLAPS: ITS TBA FOR SUBCUTANEOUS TPA

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**Objective** To report the use of subcutaneous alteplase (rt-PA) to salvage a free flap (FF) with vascular compromise, and review the literature for this practice.

**Clinical Features** A 61-year-old male was admitted for a left midfoot fusion and FF transplantation, after sustaining a Lisfranc fracture.

A FF was used to reconstruct the left dorsal foot. Eight hours post-operatively the flap darkened and tissue turgor increased. Re-exploration revealed a venous thrombus crossing the anastomosis.

**Interventions, Case Progress and Outcomes** The clot was removed, anastomosis revised and 2mg alteplase was administered subcutaneously hourly into the flap for 39 doses in total.

Within 4.5 hours flap vascularity improved, becoming pink and warm with strong Doppler signals. The flap eventually succeeded, however the midfoot fusion was complicated by a pseudomonal infection.

Subcutaneous alteplase has been used at least three times at our institution to salvage FF, with varied success. In this context, the pharmacist investigated the evidence to support this practice.

Between 5–10% of FF transplants are complicated by vascular thrombosis. Time to re-exploration, thrombectomy, and anastomotic revision is most critical, with successful intervention generally occurring within 24 hours. If thrombosis occurs, the literature outlines various FF salvage strategies after anastomotic revision, including intravenous heparin, thrombectomy, intra-arterial thrombolysis, and five reported cases of successful thrombolysis with 2mg alteplase injected subcutaneously into venous congested flaps.

**Conclusion** There is limited evidence to support the subcutaneous injection of 2mg alteplase into a venous congested FF during attempted flap salvage and more research is required.

125 DAZED AND CONFUSED: VARIABILITY AND CONSUMER FEEDBACK ON THE DISCHARGE INSTRUCTIONS OF HIGH-RISK ‘PINCHA’ MEDICATIONS

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**Background** Patients commonly leave hospital with variable courses of high-risk ‘PINCHA’ medications, including oral anticoagulants and opioid medications, and may not be in their pre-morbid cognitive state to comprehend instructions on these medications. It has been observed by pharmacists in the post-discharge clinics that medication self-administration errors have occurred due to unclear or variable wording.

**Aim** To identify error-prone wording and provide pharmacists with standardised templates of ‘PINCHA’ medication instruction for patient discharge lists.

**Methods** Discharges over a two-week period were identified, and reviewed for those which contained new oral anticoagulant or opioid medications.

Examples located were analysed for differences in wording and presentation. Post-discharge consumer feedback was utilised to identify which examples were confusing or error-prone.

Based on the information collected, a template was prepared with optimal wording for high-risk medications.

**Results** 148 discharge lists containing target medications were identified:
DISEASE IMPULSE CONTROL IN HUNTINGTON’S MANAGEMENT OF AGGRESSION AND IMPULSIVITY

Clinical Features

A 37-year-old female with Huntington’s disease was admitted due to increasing challenges for her family to manage her impulsivity, disruptiveness and aggression. She also had comorbid panic disorder, agoraphobia, past trauma history, multiple suicide attempts and previous alcohol and amphetamine use. Her phenotypic manifestation of the Huntington’s disease is characterised with well controlled chorea but debilitating mental and behavioural symptoms, including anxiety, depressed cognition, perseveration and marked irritability.

**Intervention, Case Progress and Outcomes**

There was a noticeable decrease in aggression with the initiation of lamotrigine, amantadine and clonidine, with significant decrease in pro-re-nata (PRN) medication use for aggression and no seclusion events. The reduction in aggression allowed increased therapy engagement with the multidiscipline team. Her family is now willing to take her on leave from hospital as she is much more settled and her father is looking forward to bringing her home permanently with her improvement.

**Conclusion**

Pharmacological management of aggression and impulsivity is complex and the mechanism of action is not well understood. Lamotrigine, amantadine and clonidine demonstrated a good effect on impulsivity and aggression in this case. Clinical pharmacists are heavily involved in drug selection, carers’ education and drug response review in cases like this one where conventional therapy fails.

**Methods**

A retrospective study was conducted at a tertiary hospital to review all kidney transplant recipients and identify patients who experienced hyperglycaemia during the initial six weeks post-kidney transplantation, and/or had been prescribed insulin. Data on patient demographics, blood glucose monitoring and insulin prescribing in the initial six weeks post-kidney transplantation were collected and analysed.

**Results**

Between January 2016 and March 2017, 133 patients were admitted for a kidney transplant. 43 patients experienced one or more incidents of hyperglycaemia during the initial six weeks post-kidney transplantation, while 26 of these patients had been prescribed insulin. The mean number of readings recorded during inpatient admission in the morning, afternoon and night time were 91.37%, 35.77% and 51.80% respectively. The mean time of the first documented elevated reading was 19.09 hours post-kidney transplantation, with a mean reading of 12.75mmol/L. The mean initial total daily dose of insulin prescribed was 0.36units/kg, with a mean time of 2.38 days until the first dose adjustment and a mean of 9.24 dose changes over the six weeks.

**Conclusion**

There is inadequate monitoring of blood glucose levels in the early post-transplantation phase. Improved monitoring can allow for individualised and accurate prescribing of insulin, ultimately decreasing the morbidity, mortality, and risk of allograft dysfunction associated with hyperglycaemia.
128 EVALUATION OF A MULTIFACETED, COLLABORATIVE MANAGEMENT PROGRAM FOR PATIENTS WITH CELLULITIS IN THE EMERGENCY DEPARTMENT

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Background While cellulitis is frequently treated in Emergency Short Stay Units (ESSU), many patients fail ESSU management, requiring inpatient admission or over-staying Emergency Department (ED) time limits.

Aim To determine if a multifaceted, collaborative cellulitis management program involving a new guideline, staff education, and early ED pharmacist involvement would reduce ESSU failure rates without compromising patient outcomes.

Methods A retrospective cohort study compared management of patients with cellulitis admitted to the ESSU of a major tertiary institution, before and after implementation of the cellulitis management program (control period: January 1, 2013–December 31, 2014; post-intervention period: February 17, 2017–August 31, 2017). ESSU failure was defined as a stay in the ED/ESSU >28 hours or transfer to an inpatient unit. Other outcomes included appropriateness of antimicrobial therapy, adherence to the new guideline and hospital readmission rates.

Results A total of 451 and 131 patients were admitted to the ESSU in the pre- and post-intervention cohorts respectively. 46 patients (35.1%) received the full intervention with early ED pharmacist involvement. The intervention led to a non-significant decrease in the ESSU management failure rate (21.7% vs. 34.8%; p=0.07). There was no significant difference in seven-day readmission rates between groups (4.3% vs. 3.8%; p=0.65).

Conclusion A collaborative cellulitis management program may improve the proportion of patients with cellulitis successfully managed in the ESSU. While no statistically significant difference in failure rate was observed, the preliminary results are of clinical significance and warrant further investigation. Analysis of patients admitted between September 2017 and June 2018 is ongoing.

129 TOTAL INTENDED ANTIBIOTIC DELIVERY RELATED TO CONCENTRATION AFFECTING FLOWRATE OF ELASTOMERIC DEVICES USED IN OPAT

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Background Many studies investigate drug stability in extended home-infusion pumps, but little is known of other factors which may affect the total daily dose the patient receives. It has been previously noted that up to 40% of these infusions do completely Infuse within the designated run out time.

Aim Investigate if concentration can affect the flow rate of home-infusion pumps and thus the total dose the patient receives in OPAT.

Methods The flow rates of 10 different drug/dose formulations (4g to 18g in 0.9% sodium chloride) in Baxter-LV10 infusion pumps were investigated. The pumps were run out 31°C and weighed at intervals with flow rate and total volume infused calculated over the 24-hour period.

Results Piperacillin/Tazobactam-18g was the only formulation to not meet the minimum standard of 90% of the volume being infused over the 24-hour period. This indicates a failure of intended therapy. The expected dose delivered can be calculated as: %dose delivered = 1.9x + 122.85 (where x = total drug and excipient weight within the infusor).

Conclusion Dose has an inverse relationship to flow rate with the Baxter-LV10 Infusor. Under nominal conditions any amount greater than 12.02g in the 240mL infusor will result in an incomplete run-out over the 24-hour period. Clinicians should be aware that prescribing daily doses higher than 17.28g may result in less than 90% of the intended dose being received by the patient. Further research is needed to confirm if this decrease in flow rate results in poor clinical outcomes.

130 REDUCING PAEDIATRIC MEDICATION ERRORS AND HOSPITAL STAY: A SYSTEMATIC REVIEW OF CLINICAL PHARMacist INTERVENTIONS

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Aim To determine how the professional activities of clinical pharmacists benefit paediatric hospital patients.

Methods A systematic search for original-research, English-language articles published between January 2000 and October 2017, within the PubMed, CINAHL, EMBASE, AustHealth, and Google Scholar databases was conducted. MeSH terms included: ‘clinical pharmacist’, ‘paediatric/pediatric’, ‘hospital’, and ‘intervention’. Articles discussing pharmacist-initiated interventions on paediatric patients were eligible for inclusion.

Results Twelve articles matched the eligibility criteria, encompassing over 35 000 paediatric patients in nine countries, who received 11 209 pharmacist interventions relating to prescriptions and medication orders. The average acceptance rates of these interventions was nearly 90%, and led to reductions in medication errors, improvements in medical condition management, cost-savings, and reduced length of hospital stay. Prevented medication errors included over- and under-dosing, missed doses, gaps in medication history, allergies, and near-misses. Cost savings were substantial due to reduced wastage.
in total drug costs, and the prevention of adverse events and their associated costs. Clinical pharmacists also improved patient understanding, satisfaction, and adherence to their medications. Interventions provided by clinical pharmacists were most beneficial during ward rounds and the medication-ordering phase of treatment, where real-time advice to prescribers could be provided, which in turn led to a high acceptance of pharmacist recommendations.

Conclusion Clinical pharmacists play an essential role in multidisciplinary care, and can deliver substantial benefits for paediatric hospital patients, by reducing medication error frequency and severity, and reduced costs related to adverse effects, drug utilisation, and length of hospital stay.

131 TIME UNDER PRESSURE: AN ASSESSMENT OF THE BAXTER ELASTOMERIC (LV-10) INFUSOR PUMP UNDER HYPERBARIC CONDITIONS

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Background Hyperbaric oxygen treatment is often used in conjunction with Outpatient Parenteral Antimicrobial Therapy (OPAT). Whether the hyperbaric environment affects the flow rate of elastomeric infusion devices in this setting is unknown.

Aim Assess the flow rate of the Baxter elastomeric LV 10 infusor pump under common hyperbaric treatment pressures.

Methods Test antibiotic infusions diluted in 0.9% Sodium Chloride were secured to participants in the same manner as a typical patient. The luer lock was attached to the participant's arm to achieve optimum temperature (31.1°C). Pumps were tested at 0 (sea level), 101, 140 and 180 kilopascals (kPa) at 0–2 hours (beginning of infusion) and 19–21 hours (towards the end of infusion). Pumps were weighed before and after each test to determine delivered volume (1mg = 1ml).

Results Mean flow rates ranged from 9.4 +/- 0.4 ml/hr to 10.7 +/- 0.4 ml/hr. Only two observed flow rates differed by more than 20% of the expected flow rate. Two-factor ANOVA demonstrated no statistically significant difference in flow rates for the four pressure groups (F=0.18, p=0.671) or the two time periods (F=0.061, p=0.611).

Conclusion The flow rate of the Baxter elastomeric LV 10 infusor pump was not significantly affected by increased ambient pressure. Baxter elastomeric LV 10 infusor pumps can be safely used to administer antibiotics in hyperbaric chambers. Further research is needed to investigate the effect drug choice and dose/concentration may have on flow rate.

132 VANCOMYCIN DOSE MANAGEMENT IN NEONATAL INTENSIVE CARE UNITS (NICU)

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Background Vancomycin is commonly used in neonatal antimicrobial regimens to treat coagulase negative staphylococcal infections (CoNS). Different regimens are currently used across NICU in Australasia, creating variation in dosing schedules and adjustments.

Aim To optimise vancomycin management in a NICU setting through development of a dose adjustment guideline.

Methods Due to a lack of suitable dose adjustment programs for this population, an algorithm was developed following review of current guidelines and consultation with medical staff. 48 neonates admitted to NICU for CoNS and treated with vancomycin from 2012–2016 were included in the study. 91 vancomycin levels following dose adjustments were analysed to determine proportions below and within target concentration (TC) 15–20mg/L. The proposed guideline was retrospectively applied to determine the proportion of levels within TC after the theoretical adjustment.

Results 42.9% of levels were below TC. Following a clinical dose adjustment, 33.3% of the low levels achieved TC. When the proposed guideline was applied to the same group, 61.5% of the low levels would theoretically have achieved TC. 36.3% of vancomycin levels were within TC. Following a clinical dose adjustment, 48.4% of in-range levels stayed within TC. When the proposed guideline was applied to the same group, 100% of in-range levels would theoretically have remained within TC.

Conclusion The application of the proposed guideline demonstrated a near two-fold increase in the proportion levels following dose adjustments that would achieve TC. This proposed guideline assists in optimising vancomycin therapy, warranting prospective evaluation in neonates with CoNS where vancomycin is indicated.

133 BISPHOSPHONATES IN KIDNEY TRANSPLANT PATIENTS: TIME FOR A HOLIDAY?

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Aim To identify the number of post kidney transplant patients currently receiving a bisphosphonate in which the treatment duration is greater than five years. To establish if the extended duration was a conscious decision.

Methods A retrospective point prevalence cohort study was performed at a major tertiary hospital. The study identified patients who had undergone kidney transplantation between the years of 2008 and 2013 and were
subsequently commenced on a bisphosphonate. Bisphosphonate initiation date, markers of bone turnover (P1NP, CTX, PTH), bone mineral density scores and duration of therapy was recorded.

**Results** Eleven of the fifty-eight patients in the study were currently receiving bisphosphonate therapy for greater than five years. Eight patients did not have commentary regarding intended duration of therapy. In three of these patients, documentation noted an intention to cease the bisphosphonate however it was not executed. For all eleven patients, the bisphosphonate initiation date was never clearly documented by the pharmacist, demonstrating an area for improvement.

**Conclusion** This study highlights the importance of pharmacist and clinician documentation regarding bisphosphonate initiation and intended duration of therapy. Although the optimal duration of bisphosphonate therapy in patients post kidney transplant patient is not well defined, pharmacist should flag patients who are approaching the five-year mark to allow timely review of the ongoing appropriateness of therapy by the treating clinician.

134 **OPIOID PRESCRIBING ON HOSPITAL DISCHARGE – “WE CAN NO LONGER OXYCONDONE POOR PRESCRIBING”**

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**Aim** To describe baseline opioid prescribing patterns on discharge across selected units at a tertiary teaching hospital, and assess pharmacists’ interventions to opioid prescriptions.

**Methods** A retrospective analysis was conducted of discharge prescriptions written in May 2018 across selected units. Subsequently, a two-day prospective audit was undertaken to quantify clinical and legality-based pharmacist recommendations to opioid prescriptions.

**Results** A total of 755 discharges were retrospectively screened; 411 met inclusion criteria. Of these, 285 contained at least one opioid, with 463 opioids prescribed in total. Immediate release oxycodone comprised 52.3% of prescriptions; 25.3% were for oxycodone/naloxone preparations. Overall, 89.9% of opioids were initiated in hospital. There was no documented weaning plan for 17.1% of regular opioids. The average daily maximum morphine equivalence prescribed ranged from 59mg (acute medical unit) to 69mg (cardiothoracic).

A total of 130 prescriptions were checked by pharmacists in the prospective audit, where 90 opioids for 57 patients were identified. Pharmacists made 35 clinical recommendations and 51 recommendations regarding legality. The most frequent clinical recommendations made were to alter the quantity prescribed (25.7%) or to add an opioid for breakthrough pain (14.2%). The most frequent recommendation relating to legality was to specify the number of repeats authorised in words and figures (45%).

**Conclusion** The volume of opioids prescribed on hospital discharge and the number of associated pharmacist interventions supports the need for robust clinical governance in this area. In light of the current opioid epidemic, it’s time to intervene to improve prescribing.

135 **EXPANDING THE OUTREACH Pharmacist ROLE: DELIVERING PHONE BASED MEDICATION EDUCATION TO CARDIAC CLIENTS**

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**Aim** To investigate the effectiveness of phone-based medication education delivered by an outreach pharmacist to cardiac clients living outside the home visit catchment area.
**Clinical**

136 TOO MUCH OF A GOOD THING? A CASE REPORT OF LIQUORICE INDUCED HYPOKALAEMIA

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**Objective** To describe a case of hypokalaemia in a patient with chronic, excessive ingestion of liquorice and to highlight the pharmacist’s role in the synthesising clinical presentation with curious questioning during patient interview.

**Clinical Features** JS, a 39-year-old female, 26-weeks pregnant, presented to hospital with nausea, vomiting and weakness. Severe hypokalaemia (2.0 mmol/L) and metabolic alkalosis were noted. Past medical history included first degree heart block, depression, hyperthyroidism and chronic hypokalaemia.

**Interventions** JS was treated with multiple potassium infusions and cardiac monitoring. Pharmacist interview in the emergency department revealed JS was consuming over 200g of natural liquorice 3–4 times per week chronically. Treating doctors were notified of this finding.

**Case Progress and Outcomes** Endocrinology review concluded the cause of hypokalaemia was likely multifactorial from recent gastrointestinal losses, decreased dietary intake and chronic liquorice ingestion. Natural liquorice contains glycyrrhizic acid that inhibits 11-beta-hydroxysteroid dehydrogenase, responsible for inactivating cortisol. Prolonged, high-level exposure to glycyrrhizic acid, produces hypermineralocorticoid-like effects including: hypokalaemia, hypernatraemia, fluid retention, hypertension and metabolic alkalosis. The onset and symptom severity are duration and dose-dependent and generally reversible within several weeks of discontinuing liquorice.

JS was discharged following normalization of potassium level. Liquorice cessation, monitoring for electrolyte abnormalities and further potassium supplements were recommended on discharge.

**Conclusion** This case illustrates the importance of emergency department pharmacists linking their clinical questioning to the patient’s presentation. Exploring patient use of not only prescription and over the counter medications, but also herbal and dietary supplements or recent dietary changes is also essential.

137 EXPLORING REAL LIFE EXPERIENCES OF LUMACAFTOR/IVACAFTOR IN CYSTIC FIBROSIS PATIENTS WITH SEVERE LUNG FUNCTION

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**Background** Cystic Fibrosis Transmembrane Regulator (CFTR) modulators including lumacaftor/ivacaftor (LUM/IVA) are novel treatments for certain cystic fibrosis (CF) mutation types, however evidence from non-trial environments is lacking.

**Aim** To analyse longitudinal effects on lung function and body mass index (BMI) in patients receiving LUM/IVA in clinical practice.

**Methods** All patients prescribed LUM/IVA for >1 month since its availability in January 2016 and not participating in a clinical trial were included. Pulmonary function (ppFEV1) and BMI 12-months prior to and during LUM/IVA treatment were analysed.

**Clinical variables including positive fungal cultures and hospital admissions were recorded.** Difference in lung function and BMI (p<0.05). Previous fungal cultures had no association with ppFEV1 or BMI changes. A statistically significant reduction in ppFEV1 decline after commencing LUM/IVA was observed, from a median annual decline of 3% to a median increase of 2% in the 12-months prior and after LUM/IVA initiation (p<0.01). An overall 54% decrease in hospital admissions was observed (p<0.01).

**Conclusion** An absolute increase in lung function was not observed, however a positive change in lung function decline, BMI and hospital admissions over twelve months suggests LUM/IVA has a beneficial effect on CF disease stability.

138 CLINICAL DECISION MAKING IN THE SETTING OF RARE AND UNEXPECTED ADVERSE EVENTS

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**Objective** To describe an unexpected case of acute kidney impairment (AKI) with high-dose chemotherapy and highlight the clinical pharmacist role within this setting.

**Clinical Features** Two patients developed AKI during StanBCNU chemotherapy (carmustine, etoposide, cyclophosphamide) prior to autologous stem cell transplantation for high-grade lymphoma. Patient 1 was a 28-year-old Caucasian male with baseline creatinine clearance of 106mL/min. Patient 2 was a 62-year-old Caucasian male with baseline creatinine clearance of 73mL/min. Neither patient had significant medication histories on admission.

**Interventions, Case Progress and Outcomes** Both cases developed an AKI after carmustine and etoposide, leading to the decision to omit...
Clinical Features

DG, a 65-year-old female, Caucasian, presented to emergency department in June 2017 with infected ulceration to right thumb. Medical history included hypertension, gout, and dermatomyositis. She was diagnosed with infected dystrophic calcinosis cutis, secondary to cyclophosphamide from their regimen. The impact of this omission on long-term lymphoma outcomes is uncertain and significant chemotherapy-related toxicities were observed in both patients, potentially due to increased drug exposure secondary to reduced renal clearance. A literature search revealed only one prior case of carmustine associated nephrotoxicity, however due to the timing of AKI, we are unable to isolate carmustine alone as the causative agent and suggest the combination with high-dose etoposide could be involved.

Critical decisions relating to chemotherapy, cessation/dose adjustment of concomitant nephrotoxins and management of transplant complications were supported by the clinical pharmacist within the multidisciplinary treating team.

Conclusion

These cases emphasise the need to be vigilant of renal function monitoring during chemotherapy, in order to minimise possible sequelae of AKI in the autologous transplant setting. Pharmacists contribute expert drug knowledge to improve patient management, particularly in the setting of rare and unexpected events.

Methods

Patients were enrolled prospectively from five metropolitan hospitals over five weeks. Those admitted to general medicine wards, ≥75 years, discharged to an RCF, and receiving ≥5 regular medications were included. A baseline of both SBP ≤120mmHg and DBP <70 mmHg were considered strong candidates for deprescribing. For patients with heart failure (CCF) only antihypertensives other than ACE inhibitors, ARB’s and beta-blockers were considered for deprescribing. For patients with ischaemic heart disease (IHD) only antihypertensives other than beta-blockers were considered.

Results

From 140 eligible patients (age 87 (15), 44% male, Charlson score 3.0 (1.8), GFR 36 (15)ml/min), 37 (26.4%) had both SBP ≤120mmHg and DBP <70 mmHg. This included four CCF patients on non-essential calcium channel blockers (CCB), five IHD patients receiving antihypertensive medication other than beta-blockers, and 14 non-CCF non-IHD patients on a variety of antihypertensive medications. In total 23 (16%) patients were strongly eligible for deprescribing, but only five had antihypertensive medications ceased.

A further 10 (7.1%) patients had isolated SBP≤120, and 35 (25.0%) had isolated DBP<70.

Conclusion

Current deprescribing practice for this cohort does not consider mounting evidence indicating increased mortality in this population associated with SBPs120 and DBP<70, the increased frequency of falls with higher antihypertensive burden, and marked natural decline in BP in the last 10 years of life. Development of this area in the hospital setting is urgently needed, along with structured guidelines for antihypertensive deprescribing.
Background OADs are increasingly used for cancer treatment. However, fatal outcomes have been associated with patients misinterpreting dosage instructions. Guidelines recommend that prescriptions for OADs be checked by an oncology pharmacist and that patients receive counselling before commencing therapy. Prior to the start of this pilot, neither was standard practice in the Oncology Department.

Methods A pilot for an OAD counselling clinic was developed. After oncologist review, a pharmacist checked the prescription, counselled the patient on drug dosing, provided written information on the OADs and checked their medicines for interactions. Patients with complex needs were seen by the Clinical Nurse Consultant. Patients were followed up by telephone one week after commencing treatment to ensure they were taking the correct dose and to assess any side effects. Here we present the results from the pharmacist input into the clinic for the first 26 weeks of the pilot.

Results Thirty-nine patients were seen during the pilot. Fifty-five consultations were undertaken of which 38 were in clinic and 17 were telephone follow ups. The majority of patients had a gastrointestinal primary tumour and capcitabine was the most commonly prescribed OAD. A number of clinically important interventions were made. One intervention was for an incorrect dose and one patient experiencing side effects that necessitated treatment cessation was identified.

Conclusion While the number of patients seen was modest, the safety of prescribing OADs for these patients was greatly improved. All patients commencing OADs should be provided with specialist counselling prior to commencing an OAD.

Aim To measure the incidence of proton pump inhibitor (PPI) use in renal and general-medical inpatients with chronic kidney disease (CKD), identify the rate of inappropriate and long-term (>6 months) PPI use in these patients and to observe CKD progression in this subgroup of patients.

Methods A prospective audit was conducted over a two-week data collection period. Adult renal and general-medical inpatients with CKD were screened for PPI usage. Drug dose, indication, duration of therapy, current estimated glomerular filtration rate (eGFR) and eGFR 6–12 months prior to admission were recorded for eligible patients. Dialysis-dependent patients and those located in the emergency department and intensive care unit were excluded. Therapeutic Guidelines: Gastrointestinal was used in consultation with a gastroenterologist to compile a list of appropriate PPI indications. Gastro-oesophageal reflux disease was assumed in the absence of a documented indication.

Results 87 renal and general-medical inpatients with CKD were screened for PPI usage. Drug dose, indication, duration of therapy, current estimated glomerular filtration rate (eGFR) and eGFR 6–12 months prior to admission were recorded for eligible patients. Dialysis-dependent patients and those located in the emergency department and intensive care unit were excluded. Therapeutic Guidelines: Gastrointestinal was used in consultation with a gastroenterologist to compile a list of appropriate PPI indications. Gastro-oesophageal reflux disease was assumed in the absence of a documented indication.

Conclusion Over half of the renal and general-medical inpatients with CKD were PPI users. Many use them long-term, potentially without an appropriate indication. There is a hypothesized risk of CKD progression with long-term PPI use. Further research is required to evaluate if limiting PPI use reduces the risk of both development and progression of CKD.

Aim To develop an opioid safety strategy utilising electronic medication management systems (eMEDs), which fits within current clinical workflows and resources to monitor and prevent ORADEs.

Methods A district opioid safety project team was established via innovation funding to develop opioid safety initiatives. Fifteen months of baseline data of opioid related incidents and ORADEs were identified using the incident information management system (IIMS) and Health Information Exchange (ICD-10 AM coded) data. These identified trends and informed a prevention-oriented education strategy and resources to support safe opioid use. An electronic screening tool to identify patients at increased risk of ORADEs was developed using recognised risk factors from the literature.

Results 776 inpatients with coded ORADEs were identified, the most common ORADE being constipation (28%). Ability to link some ORADEs to specific opioids via eMEDs, alongside IIMS data, enabled focused education for pharmacists and an academic detailing education strategy for other staff. Guidelines for safe opioid use were developed. Additionally, eMEDs was identified as not always supporting best
Aim
The occurrence of psychosocial symptoms in patients diagnosed with cancer is being increasingly recognised, with reported incidences between 30% to 60%. To address identified knowledge gaps of cross discipline treatment strategies, this study aimed to develop a tool to assist both psychology and oncology prescribers and pharmacists with identifying interactions between psychotropics and chemotherapeutics commonly used in a large, tertiary teaching hospital.

Methods
A list of the most commonly used chemotherapeutics, antipsychotics, antidepressants and mood stabilising agents was identified. A comprehensive database of drug interactions between these psychotropics and chemotherapeutics was developed using several tertiary references commonly utilized by a Medicines Information pharmacy department.

Results
The developed tool describes the nature, severity and clinical significance of drug interactions between psychotropics and chemotherapeutics. To improve clinical utilisation the clinician tool features only the most pertinent information relevant to prescribing, whereas the pharmacist tool captures essential information regarding drug interactions and all-important risk mitigation strategies. These tools are being evaluated as a useful resource for clinicians when prescribing psychotropics for patients undergoing chemotherapy in a large tertiary centre.

Conclusion
Development of clinically appropriate quick reference tool for antipsychotic and chemotherapeutic agents intended to increased clinician awareness of potential drug interactions and encouraged pharmacist consultation. Future work will focus on broadening applicability of the tools, especially with regards to the outpatient dispensing of targeted therapies.

Results
Forty-eight MET calls were reviewed and there was no clear process identified for pharmacist medication review after a MET call. Ketamine, benzodiazepines and anti-epileptics were commonly prescribed around the MET calls and delayed antibiotics, refused medications, patients at high risks of falls, medication titration and polypharmacy were contributing factors. Pharmacist documentation of the MET call on the medication management plan (MMP) was recorded for six patients, and eight patients had changes to medications immediately following a MET call documented on the MMP without a record of the MET call occurring.

Conclusion
There is potential for pharmacists to play an important role in the prevention and review of patients after a MET call, and documentation of this contribution can be improved. Understanding the medication related factors that contribute to MET calls is key and the development of a standard of practice for pharmacist’s review of patients after MET calls is currently underway.

Clinical Features
Our patient is a 39-year-old female with a history of posttraumatic stress disorder (PTSD), attention deficit hyperactivity disorder, bipolar II disorder, depression, previous suicide attempts, alcohol substance use disorder and previous methamphetamine use. She was taking multiple medications including anti-depressants, anti-craving agents and a mood stabiliser.
Interventions, Case Progress and Outcomes

Our patient complained of nightmares and self-medicated with alcohol. She was commenced on a short course of zopiclone and counselled on good sleep hygiene measures. After ceasing the effective zopiclone, her nightmares returned so she was commenced on agomelatine.

The agomelatine addressed her sleep regulation, however nightmares were still present.

She was initiated on low dose prazosin (0.5mg at night) and after two weeks reported sleeping better with fewer nightmares. This dose continued for two years when the dose was increased to 2mg at night after a recurrence of self-medicating with alcohol.

The prazosin dose continued to be gradually increased over the next 6 months to 8mg at night and 1mg in the morning.

Now three years later and free from nightmares, the decision was made to slowly wean the prazosin. She reduced her dose by 1mg per week until it was ceased.

Conclusion

Our case demonstrates the successful use of prazosin to treat PTSD nightmares. She demonstrates prazosin is a good treatment option for patients on other medications, with comorbidities or with substance abuse.

Methods

This prospective cohort study enrolled patients across five hospitals over five weeks. Patients admitted to general medicine wards, ≥75 years, discharged to a residential care facility (RCF), and receiving ≥5 regular medications were included.

Medications were assessed against recognised deprescribing guidelines when available, and developed by consensus if no guideline existed. Drug groups of interest were anticoagulants, antidiabetics, antiplatelets, antipsychotics, benzodiazepines, proton pump inhibitors (PPI) and statins. Medications were assessed to determine deprescribing during the admission, at discharge, and potential for further deprescribing.

Results

Eligible patients (n=181) were 87 (7) years, 45% male, Charlsons score 2.8 (1.8), GFR 37 (15) ml/min and median stay of 8 days. At admission patients were using 9.7 (3.3) regular medications.

Anticoagulants (n=45), 26 (58%) were eligible for deprescribing, 10 (23%) were deprescribed.

Antidiabetics (n=38), 23 (61%) eligible, 9 (39%) deprescribed.

Antiplatelets (n=73), 23 (32%) eligible, 2 (9%) deprescribed.

Antipsychotics (n=24), 11 (46%) eligible, 3 (27%) deprescribed.

Benzos (n=50), 17 (34%) eligible, 2 (12%) deprescribed.

PPIs (n=102), 91 (89%) eligible, 8 (9%) deprescribed.

Statins (n=62), 16 (26%) eligible, 8 (50%) deprescribed.

At discharge 9–50% of eligible medications were deprescribed. During the admission 1.2 (1.6) medications were ceased, 1.4 (1.8) initiated, 0.5 (0.7) decreased, and 0.3 (0.6) increased.

Conclusion

Most patients were receiving multiple medications eligible for deprescribing. Some deprescribing occurred, but with much opportunity for discussion around further deprescribing.
routes and doses prescribed. Overall, 33% of patients met all criteria for appropriate management.

A local management procedure was developed in conjunction with the drug and alcohol service. Four presentations to nursing staff and two to medical and pharmacy staff were performed.

Conclusion Inappropriate management of AW patients drove the development of a hospital wide management procedure. Education on this procedure has been well received. Future research will determine its effectiveness.

149 ADVANCED TECHNICIAN IN A SPECIALISED BONE MARROW TRANSPLANT CLINIC

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Aim To evaluate benefits and feasibility of introducing an advanced technician in a specialised Pre-BMT clinic.

Methods Tasks needed for the Pre-BMT clinic were identified and were divided into two groups: tasks to be performed by the BMT pharmacist and tasks that can be taken over by technician. The technician received training before taking over these roles. The time spent for the technician’s tasks was measured and accuracy of the performance was evaluated by the BMT pharmacist over a seven-week period.

Results Tasks that can be performed by the technician included identification of patients and time for clinic, identifying the type and conditioning of BMT, preparation of medication history taking, preparation of patient education tools and the claim for payment. The technician was trained to make bookings, identify BMT type from referral minutes and BMT coordinators, prepare education tools according to the specific BMT type, and claim the clinic activities for payment. During the seven-week evaluation period, 23 patients were seen in Pre-BMT workup clinic. An average of 1.25 hours weekly was spent to perform these tasks for average of 3.3 patients weekly, with 100% accuracy reported.

Conclusion With adequate training technicians can be involved in highly specialised Pre-BMT clinic. This saves the Pharmacist time to concentrate on specialist clinic activities. Further studies are warranted on the technician’s role in other specialised areas.

150 CALCIPHYLAXIS – A CASE STUDY

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Objective To show that the pharmacist can contribute to the successful treatment of calciphylaxis, a rare, life-threatening syndrome of vascular calcification, in a regional hospital.

Clinical Features Calciphylaxis manifests as occluded microvessels in the subcutaneous adipose tissue and dermis. Lesions are intensely painful and may escalate to malodorous ulcers with black eschars.

The patient is a 48-year-old indigenous woman with end-stage renal disease secondary to diabetic nephropathy. She has been performing home-haemodialysis in a rural town since July 2013. She was known to be poorly adherent to her dialysis and medical prescriptions. Progress was further complicated by renal anaemia and hyperparathyroidism.

Interventions, Case Progress Multi-disciplinary education and interventions by pharmacy, renal, surgical and wound management professionals have defied the poor prognosis of 45–80% one-year mortality in a uremic patient.

Debridements, removal of much of the abdominal apron and thrice weekly infusions of sodium thiosulfate (SAS) administered during the last 30–60 minutes of dialysis between May 2017 and the present contributed to the successful outcome.

Outcomes The patient is now engaged in her ongoing therapy and can proudly tell you her current biochemical “numbers”. She is compliant with attendance and inter-dialytic weight gains and grateful to be alive.

Conclusion Calciphylaxis is a difficult to treat condition. Education by the pharmacist has alerted staff who regularly sees the patient to identify early skin changes. The pharmacist was also able to access sodium thiosulfate infusions which have been administered for 18 months.

151 ACUTE COLONIC PSEUDO-OBSTURATION LEADING TO PERFORATION: A CASE-CONTROL STUDY

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Aim An apparent ‘cluster’ of patients experiencing acute colonic pseudo-obstruction (ACPO) complicated by colonic perforation within our institution led to the exploration of causal links between ACPO complicated by perforation and known aetiological factors, including a potentially new cause: tapentadol.

Methods In this retrospective, case-control study ICD-10-AM coding was used to identify patients with ACPO and subsequent perforation between August 2014 and March 2017. Four controls were identified for each case and matched based on age, sex, admission date and admission unit.

Results A total of 40 patients were included (8 cases and 32 controls). Mean age for cases and controls was 63.7yrs (SD 15.0) and 62.1yrs (SD 11.3), respectively (p=0.634). There was a significantly higher incidence of alcohol use among cases (p=0.031) but similar incidence of other comorbidities. The
mean duration of opioid use was longer for cases, 7.6 days (SD 1.6) compared with controls, 5.0 days (SD 3.1), (p=0.023). The median total opioid use (Oral Morphine Equivalence) of 975mg in cases [IQR 780–1256mg] versus 324mg in controls [IQR 71–681mg], (p=0.407) was not statistically significantly different. The incidence of tapentadol use was not significantly different between cases (50%) and controls (32%), (p=0.338). There were no significant differences in electrolyte imbalance, laxative use or inotropic support.

Conclusion An association was identified between ACPO complicated by bowel perforation, high background ethanol requirement and longer duration of opioid use, but not total opioid exposure or tapentadol use. There is a need to combine contemporary data from multiple sites to confirm these associations.

152 CLINICAL AUDIT OF URINARY TRACT INFECTIONS IN RENAL TRANSPLANT PATIENTS

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Aim To identify the prevalence, risk factors and outcomes for post-transplant urinary tract infections (UTI). To quantify the use of Bactrim® in the renal transplant population.

Background UTIs are the most common infections experienced by renal transplant recipients. and are associated with increased morbidity and acute graft dysfunction. Controversy exists on whether UTIs impair overall graft and patient survival and the benefit of UTI prophylaxis.

Methods Seventy-two patients who had a renal transplant during a 5-year period charts were audited. Analysed for UTIs presence and number, UTI risk factors (e.g. female, hyperglycaemia) changes in renal function and use of Bactrim®.

Results Of 72 renal transplant patients, 20 (28%) had at least one UTI (range 1–16 episodes, mean 3.85) in 5 years. Bactrim® (800/160mg) was used prophylactically by 92% (66/72) patients with 72% taking 0.5 tablet daily (52/72). Older age (p=0.015), female gender (p <0.001) and hyperglycaemia (p=0.037) were risk factors for developing a UTI. Females (OR 8.54), pre-existing urogenital abnormality (OR 12.96) and CMV viraemia at any time-point (OR 10.77) were statistically significant risk factors for a UTI on adjusted analysis. There was no significant change in renal function from baseline to two years post-transplant irrespective of UTI presence or frequency.

Conclusion A UTI occurred in 28% renal transplant patients. A UTI is more likely to occur if female, elderly, have a pre-existing urogenital abnormality, hyperglycaemia or history of CMV viraemia. UTIs did not impair overall renal function at two years and Bactrim® prophylaxis did not reduce UTIs.

153 AMIODARONE INITIATION AND BASELINE MONITORING AT A LARGE TERTIARY INSTITUTION

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Aim To determine if patients requiring amiodarone therapy receive baseline monitoring in line with published recommendations, including thyroid function tests (TFTs), liver function tests (LFTs) and chest x-rays at a large tertiary institution.

Methods A retrospective evaluation was conducted on patients who were initiated and discharged on amiodarone at our hospital during the period of January 2017 to June 2018. Of the patients included, cardiology treated 54%, the cardiothoracic surgery team (CTSU) treated 29% and other teams treated 17% of patients.

Results Of the 200 patients who required amiodarone therapy at our centre; TFTs, LFTs and chest x-rays were performed in 69%, 99.5% and 95% of patients, respectively. Cardiology involvement significantly increased the percentage of TFTs conducted at baseline when compared to no cardiology involvement, with results of 81.1% and 38.5% respectively (p<0.05). There was no significant difference for baseline monitoring for LFTs and chest x-rays between the teams.

Conclusion Baseline TFTs, LFTs and chest x-rays were performed well at our centre when compared to other studies, however, baseline monitoring of TFT’s was suboptimal. It was found that cardiology involvement improved rates of TFT monitoring at baseline. Education and implementation of strategies to improve concordance with international recommendations is required.
154 PRESCRIBING OF ENOXAPARIN FOR THROMBOPROPHYLAXIS IN OBESE PATIENTS AT A TERTIARY TEACHING HOSPITAL

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Background Obesity increases the risk of venous thromboembolism (VTE). International literature supports dose adjustment of enoxaparin to prevent VTE in obese patients. Prescribing guidelines for dose adjustment of enoxaparin in obesity were ratified at our institution in late 2017.

Aim To analyse prescribing patterns of enoxaparin for thromboprophylaxis, with a focus on obese inpatients, before introduction of guidelines specific to obesity.

Methods Data were collected for adult patients who received enoxaparin on three selected wards from September–December 2016.

Primary outcome: percentage of obese patients (BMI ≥ 30 kg/m2) receiving dose-adjusted enoxaparin. Secondary outcome: VTE events, identified from review of discharge summaries.

Results Of the 343 patients who received enoxaparin, 92 (27%) were obese and 108 (31.5%) were overweight. Of 143 (41.7%) patients of “normal” BMI, 141 had a reported serum creatinine level. Calculation of creatinine clearance revealed 127 (90%) of these patients received an appropriate dose according to their renal function. Only two obese patients received adjusted enoxaparin prophylaxis during the study period: a medical patient received enoxaparin 60 mg daily for six days without anti-Xa monitoring, while a surgical patient received an enoxaparin dose of 40 mg twice daily for three doses before titration. Eight VTE events were identified; five were in obese patients.

Conclusion Weight-based enoxaparin dosing was not evident in this sample of 92 obese patients, who were associated with a higher rate of VTE events post-discharge. Even with lack of consensus in the literature, local prescribing guidelines are warranted, and their impact should be monitored.

155 APPROPRIATE USE OF MEDICINES: THE ROLE OF DOSE INFORMATION ON DISPENSED PRESCRIPTION MEDICINE LABELS

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Background How dosages are expressed on dispensed prescription medicine labels can lead to patient misunderstanding and inappropriate dosing. There is limited evidence relating dose information to medicine taking intentions.

Aim To determine how dose expression on dispensed prescription medicine labels impacts how people apply the information.

Methods Groups of 10 participants user tested a medicine label for pain relief tablets/capsules (total 4 labels; n=40 participants). Each label had different expressions for dosing four times a day, i.e. frequency of doses/day, approximate times of day (e.g. morning), explicit times (expressed as hours), or explicit dosing interval. Participants were asked to state the dose; when they would take the medicine if their pain started at 9am; and to plan a dosing schedule around three other hypothetical daily medicines being taken, using a table. Responses were audio-recorded, transcribed verbatim, and content analysed. Dosing schedules were coded using an a priori framework.

Results All participants found the dose on the label. Planned dosing intervals varied for labels without explicit intervals or times (range 1.5 to 7 hours). For the label with approximate times of day, 3/10 participants stated appropriate and evenly spaced dosing times. Doses were correctly spaced by ≥7 participants if the label stated a specific dosing interval, or frequency of doses/day. Over two-thirds of participants planned an appropriate dosing schedule using a table.

Conclusion Explicitly stated dosing intervals led to more appropriate dose spacing. The provision of a dosing table might assist patients with scheduling multiple medicines.

156 EVIDENCE FOR A STANDARDISED APPROACH TO NAMING MEDICINES ON DISPENSED LABELLING

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Background Patients must be able to identify a medicine’s active ingredient. Limited research has explored the impact of dispensed prescription medicine label design on people’s understanding of active ingredient. Such information would assist in developing a standardised approach to communicating medicine names on dispensed prescription medicine labels.
Aim To evaluate people’s ability to determine the active ingredient on dispensed prescription medicine labels and explore factors influencing their choice.

Methods Four groups of 10 participants each user tested 3 dispensed labels for 3 different products and dose forms (total 12 labels; n=40 participants). Four unique, fictitious active ingredients were used. Each label stated the active ingredient, followed by brand name, and used varying design features (for example, capitals, italics, bold). Participants were asked to identify the active ingredient and discussed their choice in a semi-structured interview. Face-to-face sessions were audio-recorded, transcribed verbatim, and content analysed.

Results Overall, ≤ 5/10 participants correctly identified the active ingredient for 8/12 labels, confusing the brand name for the active ingredient. Active ingredient was consistently identified correctly for eye drops labels, potentially due to the obvious “brand-like” name used. Other factors influencing choice were the current/common practice of situating brand name before active ingredient; use of capitals, bolding, or italics; or co-location of medicine strength and active ingredient.

Conclusion Information formatting and positioning on dispensed prescription medicine labels influenced participants’ ability to discern active ingredient from the brand. Changes to routine labelling practice may significantly impact medication safety.

157 THE IMPACT OF PHARMACIST INVOLVEMENT ON MEDICATION ERROR RATES IN DISCHARGE SUMMARIES

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Aim To examine the frequency of medication errors in discharge summaries and the impact of pharmacist involvement on error rates.

Methods Patients discharged from ten medical wards of a large tertiary hospital over 14 days had discharge summaries screened within 24 hrs (weekdays) and 72 hrs (weekends). Summaries were excluded if admission <24 hrs, patients had no admission medication reconciliation, no prescribed medications or were transferred to another hospital. Medication errors were confirmed with medical teams where possible. Two senior doctors blinded to pharmacy involvement assigned errors as insignificant, low, medium or high risk based on a validated probability/consequence matrix. Pharmacist involvement included electronic entry of medications on admission with screening of summaries at discharge or screening at discharge only.

Results In total, 233 summaries met inclusion criteria. Almost half (43.3%) had ≥1 medication errors (n=237 total). Summaries without pharmacist involvement had a 57% error rate compared to 31.7% with pharmacist involvement. Errors identified were confirmed as true errors with the treating team in 80% of cases. Errors were classified as insignificant (59.4%), low (31.6%), medium (5.9%) and high (2.9%). Pharmacist involvement significantly reduced any medication errors (OR 0.35, 95%CI 0.21–0.60, p=0.0001) and risk of low to high risk errors (OR 0.21, 95%CI 0.10–0.46, p=0.0001). Electronic entry of medications by a pharmacist in addition to screening did not alter error rates, p=0.50.

Conclusion Medication errors on discharge are common, but literature on the impact of pharmacists’ involvement is limited. Pharmacist involvement significantly reduced error rates, including errors with the potential to cause patient harm.

158 THE GREAT ESCAPE! USING AN “ESCAPE ROOM” GAME FOR INTERACTIVE CLINICAL EDUCATION AND TEAM BUILDING

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Aim To describe the use of an Escape Room game for pharmacy staff education and team building.

Methods A backstory involving a team of staff being called to the pharmacy at midnight to dispense a lifesaving medication was developed. However, as they enter the dispensary, they find they are trapped and can only escape with the medicine once a series of puzzles are solved. The clinical pharmacist education room was used for the scenario and pharmacists mixed with technicians in groups of four to try and “Escape” the fastest.

Solving the set puzzles required knowledge of topics that had been discussed in previous weekly pharmacist and technician education session. Puzzles utilised props such as pharmacy reference texts, medications in a Webster Pak, ancillary labels and a UV light torch.
Clinical Features

A 28-year-old female with no past medical history presented with increased bleeding and abdominal pain. Following investigations, the patient was diagnosed with APML and initial treatment with all-trans retinoic acid (ATRA) and arsenic was commenced.

Interventions, Case Progress and Outcomes

Before the diagnosis was confirmed, ATRA was commenced with urgent supply by pharmacy. We identified the risk of QT prolongation with arsenic and recommended potassium and magnesium supplementation to maintain electrolytes as well as regular monitoring of QT interval and electrolytes. The patient was identified as low risk for differentiation syndrome, therefore we recommended the lower dose of prednisolone for prophylaxis as per literature (0.5mg/kg), compared to the initially prescribed dose (1mg/kg) to decrease the risk of steroid induced side effects. The patient was at high risk for opportunistic infections and therefore we recommended prophylactic cover with trimethoprim with sulfamethoxazole, fluconazole, and valaciclovir. Upon commencement of arsenic the patient experienced severe nausea. We recommended aprepitant and lorazepam in addition to antiemetics such as olanzapine. We identified potential drug interactions with arsenic the patient experienced severe nausea. We recommended aprepitant and lorazepam in addition to antiemetics such as olanzapine.

Case Progress and Outcomes

Within one week, increasing WCC and LDH levels indicated disease progression, requiring urgent initiation of CHOP (cyclophosphamide, doxorubicin, vincristine and prednisolone). Antivirals were withheld due to thrombocytopenia. CHOP caused significant haematological toxicity, necessitating cessation after one cycle. Antivirals were re-started at lower doses due to cytopaenias, continuing until the patient’s death from infective complications, 3 months after treatment initiation.

Conclusion

In the setting of rare malignancies, oncology pharmacists have an important role in providing advice on treatment approaches where no precedent is present and only limited literature available.

Clinical Features

A 56-year-old female presented to hospital with 3-week history of dizziness, back pain, weight loss and functional decline. Elevated white cell count (WCC), abnormal T-cell population and positive HTLV-1 serology confirmed diagnosis of acute HTLV-1 ATL.

Interventions

The limited numbers of published studies and case reports available to guide therapy suggest first line antivirals. After discussion within multidisciplinary team, zidovudine 900mg daily and interferon alfa 5million IU/m2/day were started, with intrathecal hydrocortisone, methotrexate and cytarabine for potential CNS disease. Valaciclovir, trimethoprim/sulfamethoxazole, posaconazole and allopurinol were started to prevent treatment complications. Monitoring included viral load, full blood count, urea, electrolytes and lactate dehydrogenase (LDH). The pharmacist was important in reviewing literature, confirming dosing regimen, advising on routine tests and ensuring supportive and prophylactic medications were charted.

Case Progress and Outcomes

Within one week, increasing WCC and LDH levels indicated disease progression, requiring urgent initiation of CHOP (cyclophosphamide, doxorubicin, vincristine and prednisolone). Antivirals were withheld due to thrombocytopenia. CHOP caused significant haematological toxicity, necessitating cessation after one cycle. Antivirals were re-started at lower doses due to cytopaenias, continuing until the patient’s death from infective complications, 3 months after treatment initiation.

Conclusion

In the setting of rare malignancies, oncology pharmacists have an important role in providing advice on treatment approaches where no precedent is present and only limited literature available.
Clinical

161 PRESCRIBER FOLLOW-UP OF PHARMACIST CLINICAL INTERVENTIONS IN AN AUSTRALIAN TEACHING HOSPITAL

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Aim To investigate the occurrence of prescriber follow-up of clinical interventions identified by pharmacists and to identify and assess predictors influencing follow-up activity.

Methods A retrospective review of clinical interventions reported by clinical pharmacists for drug-related problems on paper national inpatient medication charts (NIMC) and discharge prescriptions was conducted for the first week of February, May, August and November (2017). Follow-up was defined as "any action documented on the medical records by a prescriber that addressed the pharmacist-identified clinical intervention". SPSS was used to perform descriptive statistics and a binary logistic multivariate regression.

Results A total of 396 clinical interventions reported by pharmacists were included in the analysis. Clinical interventions were reported on 362 NIMC and 34 discharge prescriptions. Follow-up was observed in 65% (n=258/396) of the clinical interventions by pharmacists who returned with some volume at the conclusion of their infusion. The overall average infusion rate variance for those patients who returned with some volume remaining in the device was 10.97%. Infusors with positive rate variance outside the expected +/-10% tolerance was 31.9% (n=15). The overall average infusion rate variance for those patients who returned with some volume remaining in the device was 10.97%.

Conclusion Results of the audit were forwarded to the manufacturer for further discussion around their guidelines to potentially retest the flow rate of fluorouracil with normal saline. The manufacturer has reviewed devices in early 2018, measuring specific gravity of normal saline with fluorouracil and concluding it reflects that of glucose. They will reduce their total fill volumes across the range of devices, meaning that patients will not have any remaining volume at the conclusion of their infusion.

162 PATIENTS WITH RESIDUAL CHEMOTHERAPY WHEN USING 5-FU + SALINE ELASTOMERIC DEVICES

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Aim To facilitate the collation of accurate data to address concerns with infusion rate variance with the product manufacturer.

Methods A data collection template was created for nursing staff to conduct the audit over two weeks to capture all relevant information for patients connected to an elastomeric infusor. The template included connect and disconnect times and weights of the 46hr, 96hr and 168hr devices.

Results A total of 36 devices were recorded from the same manufacturer. Infusors with positive rate variance outside the expected +/-10% tolerance was 31.9% (n=15). The overall average infusion rate variance for those patients who returned with some volume remaining in the device was 10.97%.

Conclusion Results of the audit were forwarded to the manufacturer for further discussion around their guidelines to potentially retest the flow rate of fluorouracil with normal saline. The manufacturer has reviewed devices in early 2018, measuring specific gravity of normal saline with fluorouracil and concluding it reflects that of glucose. They will reduce their total fill volumes across the range of devices, meaning that patients will not have any remaining volume at the conclusion of their infusion.

163 A RETROSPECTIVE AUDIT OF VENOUS THROMBOEMBOLISM (VTE) PROPHYLAXIS PRESCRIBING POST-CAESAREAN SECTION

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Aim To evaluate the concordance of VTE prophylaxis prescribing following caesarean section with state-wide and local guidelines and ascertain the readmission rate with embolic complications within this patient population.

Methods Women who underwent caesarean sections between March and June 2017 were included. Retrospective chart review was undertaken to collect: VTE risk factors, chemical and mechanical prophylaxis prescribed, patient weight, and subsequent admissions within three months post-discharge.

Results 71% (n=212/298) of patients identified were reviewed. 86 patients were excluded due to incomplete data. 76% (n=161/212) of patients were prescribed prophylaxis in accordance with state and local guidelines in terms of VTE prophylaxis dose, frequency and duration. 88% (n=45/51) of non-concordance was due to dose discrepancies with guideline recommendations, particularly amongst women who were underweight or obese.

1.4% (n=3/210) of patients that received chemical prophylaxis received it within the recommended time frame of 4–6 hours. Mean time to commencement was 9 hours.

17% (n=51/298) of patients re-presented within 3 months following birth. One case of VTE related complication was found (DVT). Contributing factors to this case included prolonged operating time and short duration of chemical prophylaxis prior to discharge.
Conclusion The majority of women undergoing caesarean section are prescribed appropriate VTE prophylaxis. Reducing time to first-dose of chemical prophylaxis and optimising dosage in underweight and obese individuals were two key areas identified for improvement in our facility.

164 STIFF LUCK: PERI-OPERATIVE MEDICATION MANAGEMENT IN PARKINSON’S DISEASE
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Objective To report a challenging case of Parkinson’s disease management.

Clinical Features A 78-year-old male with background of Parkinson’s disease was admitted with gastric outlet obstruction secondary to gastric volvulus. His regular medications included; Sinemet CR 200/50mg nocte, Madopar 187.5mg QID, amantadine 100mg mane and pramipexole ER 3.75mg nocte.

Interventions, Case Progress and Outcomes The patient was charted medications that could be dispersed and administered via nasogastric tube including; Madopar rapid 187.5mg QID, Kinson 100/25mg BD and pramipexole IR 1.25mg TDS. He reported increased level of stiffness and at time of review the pharmacist queried why medications were being administered via nasogastric tube when patient had gastric outlet obstruction. Neurology input was sought with the recommendation to start rotigotine (Neupro) 6mg/24 hours patch and withhold dopaminergics until able to eat/drink. Notably, the patch was tolerated well, as evidenced by less rigidity. The patient had gastroscopy and underwent laparoscopic hiatus hernia repair and anterior 180 degree fundoplication. Two-days post operatively he tolerated oral medications, resulting in patch cessation and resumption of regular pre-admission medications.

Conclusion This case has prompted discussion regarding perioperative use of Parkinson’s medications in the presence of gastric volvulus. A literature review of the topic indicated that incidence of sigmoid volvulus in Parkinson disease is not known, with few reports having been published concerning this association with limited evidence observed around perioperative management of Antiparkinsonian medications. Furthermore, this case highlights the important role of peri-operative pharmacist to aid medication management and improve perioperative patient quality of life.

165 VANCOMYCIN ENEMA? A TREATMENT OPTION FOR CLOSTRIDIUM DIFFICILE LOCALISED IN A RECTAL STUMP
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Objective To report a case where vancomycin enemas were used to treat Clostridium difficile (C.difficile) in patient who had subtotal colectomy, end ileostomy with closed distal mucus fistula and rectal stump.

Clinical Features A 45-year-old female with past medical history including Ulcerative Colitis was suspected to have C.difficile in her rectal stump. Subsequent to end ileostomy, oral absorption of vancomycin was questionable thus to target the area of C.difficile colonisation, vancomycin enemas were recommended.

Interventions, Case Progress and Outcomes The patient had marked decline in her mood, which was increasingly worsened by the suggestion of enema administration. At time of review the pharmacist identified four whole tablets in patient’s stoma bag, as desvenlafaxine. The antidepressant was changed to escitalopram, which improved the patient’s mood significantly. Importantly, the possibility of perforation secondary to vancomycin enema administration with rectal stump was raised as a concern. Vancomycin enema was commenced at dose of 500mg QID and regarding administration the pharmacist liaised with stoma therapy nurse and international guidelines, with best approach for administration determined to be using pre-inserted Foley catheter and irrigation set, diluting 500mg vancomycin with 100mL normal saline and administering via gravity per rectum, retaining for approximately 30 minutes. After four days of vancomycin enemas there was improvement in the patient’s condition and enemas were continued for a further week, after which the patient was discharged without any further intervention.

Conclusion This case demonstrates that despite this patient’s complicated anatomy, vancomycin enemas were an effective method for treating localised C.difficile infection.

166 CLOZAPINE LEVELS: NAVIGATING INFECTION AND INTERACTIONS IN A TREATMENT REFRACTORY PATIENT
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Objective Clozapine levels are known to be elevated by CYP1A2 enzyme inhibition and infection, leading to increased risk of sedation and seizures. This case describes the management of clozapine dosing in a patient with a long history of treatment resistant schizophrenia, complicated by repeated infection and concurrent ciprofloxacin treatment.

Clinical Features This case involved a 52-year-old male, non-smoker, with treatment resistant schizophrenia. He was admitted to a psycho-geriatric ward with an acute relapse in mental state and a psychiatrically complex presentation. His long admission has been complicated by recurrent infections and treatment refractory illness.
Clinical

Intervention, Case Progress and Outcomes Throughout the admission, the patient’s mental state was sensitive to the presence of infection. Treatment with ciprofloxacin required pharmacist-led advice regarding the need for levels and temporary suspension of clozapine dose titration. Due to previous good response, the intention to increase the clozapine dose was complicated by concern regarding the intermittently elevated levels. During the multidisciplinary team review, the pharmacist noted the presence of infection coincided with elevated levels and encouraged cautious titration while he was asymptomatic of infection. Despite remaining as an inpatient, he has progressed well and his clozapine dose has been safely titrated.

Conclusion Pharmacists should be aware of the need to interpret elevated clozapine levels in the context of infection as well as drug interactions. Clozapine is the most effective medication for treatment resistant schizophrenia and advice on dose adjustments should be made with care without compromising patient progress.

167 A PROSPECTIVE ANALYSIS OF INPATIENT HYPOGLYCAEMIC EVENTS AT AN ACUTE PUBLIC HOSPITAL

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Background Hypoglycaemic Events (HEs) are common in hospitalised patients and are associated with poor outcomes. A previous study suggested high levels of HE treatment kits were being utilised at the ward level.

Aim

• To identify the incidence of and factors contributing to HEs in an acute hospital,
• To assess adherence of ward management of HEs to the site’s Hypoglycaemia Management guideline, and to identify targets for staff education to improve HE management

Methods Nursing staff identified and recorded HE features on audit forms attached to HE treatment kits over a 12-week period. Identified patients’ clinical records were reviewed for features and possible causes of the HE, and adherence to the Hypoglycaemia Management guideline.

Results The audit identified 70 HEs in 32 patients. HEs were classified as mild in 48% of cases and severe in 44%. Patients with Type 2 DM were more likely to experience a severe HE then patients with Type 1 DM. Renal impairment, admission for infection, poor nutritional intake and no adjustment of a patient’s usual insulin regimen on admission were risk factors associated with identified HEs and targets for further education. Adherence to the site’s Hypoglycaemia Management guideline was poor with failures in retesting a patient’s blood glucose level after HE within required timeframes, and in providing retreatment if required.

Conclusion This audit identified a number of targets for further staff education, particularly around patients at risk of HEs. This will be undertaken collaboratively with the diabetes service in order to improve patient management.

168 VENOUS THROMBOEMBOLISM PROPHYLAXIS: A CLINICAL DECISION SUPPORT AND PRESCRIBING TOOL FOR ELECTRONIC MEDICATION MANAGEMENT

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Aim To evaluate:

• The effectiveness of a peer-to-peer promotion and feedback strategy for improving uptake of a custom electronic venous thromboembolism (VTE) prophylaxis clinical decision support and prescribing tool (VTECDS);
• The effectiveness of the VTECDS for improving risk-appropriate prescribing of VTE prophylaxis;
• The effect of the strategy on VTE risk assessment documentation and risk-appropriate prophylaxis prescribing rate; and
• User acceptability of the VTECDS.

Methods Nominated Junior Medical Officers at a tertiary teaching hospital were trained to educate and promote the use of the VTECDS to target colleagues over six weeks. Pre- and post-intervention audits of VTE risk assessment and VTE prophylaxis prescribing in inpatients were conducted for evaluation. A user acceptance survey was also incorporated.

Results Analysis of pre-intervention (n=198) and post-intervention (n=198) audit data revealed no significant differences in the rates of VTECDS uptake or risk-appropriate VTE prophylaxis prescribed. More patients had risk-appropriate prophylaxis prescribed where the VTECDS was utilised (90% (63/70)) compared with patients where the VTECDS was not used [71.5% (233/326)] (p=0.001). Documented evidence of VTE risk assessment increased significantly from 51.5% (102/198) to 68.2% (135/198) following the intervention (p<0.001). Most survey responses were favourable towards the VTECDS despite limitations.

Conclusion Peer-to-peer promotion was unsuccessful in improving VTECDS uptake in this study. Findings suggest the VTECDS is associated with appropriate VTE prophylaxis prescribing decisions and may improve risk assessment documentation rates. Experiences and user-feedback from this study should be considered in future strategies to improve adoption rate of the VTECDS.
Aim To understand and improve opioid prescribing patterns on discharge from orthopaedic units in a hospital context.

Methods Retrospective audit of orthopaedic medical records for six months. Review of hospital prescription opioids policies and protocols. Education on Safer Opioid Prescribing delivered to clinical staff and audit repeated over three months to assess change in practice.

Results In pre and post-education audits there were: 281 and 150 orthopaedic patients respectively. Pre-education, 7% of patients had an opioid management plan on discharge compared with 86% post-education. Pre-education 82% were discharged on opioids compared with 77% post. Pre-education, 30% were discharged with full PBS quantity compared with 7% post-education. Pre-education 22% of the patients were discharged with ≤ 3 days’ worth of opioids compared with 51% post-education. Pre-education 71% were discharged with both immediate release (IR) and slow release (SR) opioids compared with 46% post-education.

Conclusion In hospitals opioid analgesics are commonly prescribed for acute post-surgical pain. Overprescribing of opioids post-surgery can lead to chronic opioid use and dependence and is a safety issue for patients and community.

Increasing clinicians’ awareness about opioid prescribing and related harms has significant impact on prescribing practices. This project confirms that education leads to positive change in practice. Results show reduced prescribing of opioids, quantities and an increase of opioid weaning plan for general practitioner. This study demonstrates practical strategies to address current concerns about opioids and as a result an Opioid Prescribing Guideline is being developed.

Results The cost of implementation of the service is feasible. All survey responses were positive with 98% of parents reporting the clinic pharmacist makes a positive contribution to the care of their child. There were high numbers of interventions made by pharmacists with many of clinical significance which exceeded expectations.

Conclusion Specialist pharmacist outpatient clinics in paediatric patient high-risk groups are revenue generating, well received by the MDT, improve patient care, potentially prevent hospital admissions and promote quality use of medications.

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Outcomes Retrospective review on ECHO reports and patient management revealed misinterpretation of ECHO reports (relying on conclusions not numerical value of LVEF), confusion in interpreting results from different labs and a lack of comparison of results between reports. The oncology team expressed an expectation that the oncology pharmacist review ECHO results before releasing treatment and assist the team in identifying unexpected changes to the results.

Conclusion The pharmacy team now incorporates a compulsory check of ECHO reports for all patients on trastuzumab and pertuzumab. Results are compared with previous reports, variations of +/- 10% are escalated to oncologist.

172 SLEEPING BEAUTY: OPTIMISING COMMUNICATION OF SUSPECTED OBSTRUCTIVE SLEEP APNOEA TO GPS IN OPIOID-TREATED, POST-OPERATIVE PATIENTS

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Background A number of recent Coroner’s Cases have highlighted the risk of Opioid-induced Ventilatory Impairment (OIVI) in patients with Obstructive Sleep Apnoea (OSA). Many patients with OSA are undiagnosed.

Aim To develop a process by which a patient’s risk of OSA (as determined by an anaesthetist) can be communicated to the General Practitioner (GP), particularly in patients prescribed opioids.

Methods Identify existing practices to screen for patients with risk factors for OSA, and the prevalence of high-risk patients within the opioid-treated population of the Acute Pain Service (APS). Collaborate with the APS, Anaesthetics Department and Pharmacy, to develop a strategy within existing services to communicate to GPs when patients have been identified as being at-risk of OSA.

Results Processes exist whereby anaesthetists identify at-risk patients pre-operatively using a ‘STOPBANG’ tool. Of the patients then seen by the APS, 5% are ‘suspected’ to have OSA and are often prompted to seek GP follow-up about the condition after discharge. Anecdotally, this task is not prioritised by patients after surgery, and may place patients at increased risk of adverse health outcomes.

Conclusion The identification of patients at risk of OSA while in hospital presents an opportunity to promote follow-up screening and reduce the risk of OIVI after hospital discharge.

173 IMPACT OF TIMELY MEDICATION REVIEW IN THE EMERGENCY DEPARTMENT

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Aim To compare the time to medication reconciliation and review of pharmacist interventions between patients reviewed in the Emergency Department (ED) and those reviewed on the ward.

Methods A sample of non-same day ED to inpatient admissions were selected during two three-month periods. A further sample of patients admitted from ED to ED short-stay (EDSS) to an inpatient bed were reviewed in ED. Average time to pharmacist review was 8hrs for patients seen by an ED pharmacist, compared to 26hrs for patients reviewed by a ward pharmacist. Patients admitted from the EDSS to an inpatient bed were reviewed after an average of 30hrs. The average time to intervention resolution was 27hrs for patients seen in ED compared to 41hrs for patients reviewed on the ward. 151 interventions were recorded across the sample. The most common types were incorrect doses and omitted medications. The most common class was anti-thrombotics.

Conclusion Increasing clinical pharmacy services to ED would reduce the time to pharmacy review and resolution of medication related problems for all patients presenting to the ED.

174 ENHANCING PATIENT CARE WITH MULTIDISCIPLINARY ROUNDS IN ICU

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Aim To implement and sustain a Multidisciplinary Team (MDT) Round in a rural Intensive Care Unit (ICU) to enhance patient care.

Methods Self-assessment of the Intensive Care Services identified areas of need and in response a MDT round was introduced in June 2016. Rounds are undertaken daily (on weekdays) at the patient’s bedside and include the Intensivist, ICU Medical Officers, the patient’s nurse, Physiotherapist, Dietician, Pharmacist, Welfare Officer, ICU In-Charge Nurse and Aboriginal Liaison Officer.

were collected on the length of stay, number and type of clinical interventions, time to review and intervention resolution.

Results 179 patients were reviewed by a pharmacist after admission to the ward. 21 were reviewed by a pharmacist in ED. 1 out of 58 patients that went from EDSS and were admitted to a ward were reviewed in ED. Average time to pharmacist review was 8hrs for patients seen by an ED pharmacist, compared to 26hrs for patients reviewed by a ward pharmacist. Patients admitted from the EDSS to an inpatient bed were reviewed after an average of 30hrs. The average time to intervention resolution was 27hrs for patients seen in ED compared to 41hrs for patients reviewed on the ward. 151 interventions were recorded across the sample. The most common types were incorrect doses and omitted medications. The most common class was anti-thrombotics.
Aim
Women with substance abuse disorders have lower use of contraception. Subsequent unplanned pregnancies may increase risk of foetal exposure to addictive or teratogenic substances. The aim of this study was to describe postnatal contraceptive preferences, planning and supply challenges.

Results
100% of critically ill patients receive a consistent review by a broad scope of key clinicians, on a daily basis. Implementation of systematic changes include the development of a local operating protocol and the use of a consistent checklist for reviewing each patient.

The MDT round has now been occurring for over two years and analysis of surveys and data provide positive feedback and outcomes including:

- 60% reduction in call-backs to ICU
- 100% of staff felt they were more a part of the ICU team
- 100% of staff indicate patient care is enhanced as a result of daily assessment and introduction of timely interventions
- Interventions documented in iPharmacy have significantly increased with a large proportion of them being made during the round
- Increase in eASY (Electronic Antimicrobial Stewardship System) submissions
- Decrease in usage of restricted antibiotics including meropenem, linezolid and vancomycin

Conclusion
A MDT Round in a rural ICU has been implemented and sustained for over 2 years and has been shown to improve patient care.

Methods
A retrospective cohort study was conducted on women with substance abuse disorders discharged postnatally from a Victorian tertiary hospital during January 2015 – January 2018. Medical records were reviewed for demographic data, admission details, documented contraceptive planning, and evidence of contraceptive supply.

Results
Sixty-seven women met inclusion criteria. Twenty-six (38.8%) had undergone previous terminations, 53 (79.1%) had psychiatric disorders or cognitive impairment, and 62 (92.5%) had identifiable barriers to follow-up (e.g., homelessness). Twenty-six (38.8%) women were discharged after-hours and 8 (11.9%) either self-discharged or absconded. Fifty-eight of 67 (86.6%) women had documented discussion about postnatal contraception. Forty-two of 58 (72.4%) opted for a medicine or device, 6 (10.3%) chose sterilisation or barrier methods, 3 (5.2%) chose not use contraception, and 7 (12.1%) were still undecided when discharged. Thirty patients subsequently had contraceptives prescribed, with Implanon NXT® (etonogestral 68mg implant; 20 of 58 [34.4%] followed by yearly surveillance in 2016 – 2017 to assess effectiveness of the intervention, followed by yearly surveillance in 2016 – 2017 to assess sustainability.

Results
The average number of telephone orders per patient was reduced from 0.3 (2011) to 0.17 (2012) and has been maintained at 0.11 and 0.08 in 2016 and 2017, respectively.

The proportion of high risk telephone orders was reduced from 53.4% (2011) to 37.3% (2012). Reduction was sustained at 34.4% (2016) and 27.4% (2017).

Narcotics and sedatives were accounted for the largest number of telephone orders in 2011 (28.4%). This was reduced to 11.9% (2012) and was maintained at 9.4% (2016) and 6.9% (2017). Post-intervention audit showed 88% of telephone orders were prescribed in accordance with the new procedure in 2012. Compliance was maintained at 87.5% and 93.1% in 2016 and 2017, respectively.
Conclusion A multi-modal, multidisciplinary approach is essential to support sustainable practice change. Extensive consultation and senior leadership buy-in are critical ensuring implications for after-hours workflows and patient care are not adversely affected.

177 MEDICATION-RELATED ADVERSE EVENTS FROM THE EMERGENCY MEDICINE EVENTS REGISTER (EMER.ORG.AU)
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Background In 2012, the Australasian College for Emergency Medicine (ACEM) and the Australian Patient Safety Foundation (APSF) set up an anonymous, protected website called the Emergency Medicine Events Register (EMER) at www.emer.org.au to encourage ED clinicians about areas of focus for medication safety and quality improvement initiatives, such as system changes and educational interventions. Promotion of EMER amongst ED pharmacists will likely increase the number of medication-related adverse events reported.

Objectives To understand the medication-related incidents in the EMER database and the reporting patterns of ED clinicians.

Methods Over 400 incidents entered into EMER between December 2012 and June 2017 were evaluated. Two emergency physicians and a trained classifier from APSF coded all entries based on the natural category of the incident; in excess of 60 medication-related incidents were identified. Medication-related incidents were further evaluated by an expert panel comprising emergency physicians, nurses and pharmacists to identify the nature, significance and contributing factors for the incident.

Results Medication-related incidents were generally multi-factorial in their contributing factors and some involved fatalities, procedural errors and treatment delay. Both medical and nursing staff reported incidents. The most common medications involved were high-risk medications such as procedural medications and sedatives. Various medications were involved in treatment delays, including antimicrobials and cardiovascular medications. Specific de-identified examples will be presented.

Conclusion These incidents can inform ED clinicians about areas of focus for medication safety and quality improvement initiatives, such as system changes and educational interventions. Promotion of EMER amongst ED pharmacists will likely increase the number of medication-related adverse events reported.

178 PHARMACIST-LED PRESCRIBING AND MONITORING OF ANTIMICROBIALS
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Aim To describe prescribing and monitoring of aminoglycosides and vancomycin by credentialed pharmacists.

Methods Approval was obtained through consultation with the Drugs and Therapeutics, Antimicrobial Stewardship and Infection Prevention Committees. Pharmacists with a minimum of two years post-registration experience were required to demonstrate a set of competencies using DoseMe pharmacokinetic software and through ClinCAT and clinical case evaluations.

Results A protocol was developed detailing requirements for credentialed pharmacists to prescribe selected antimicrobials on the inpatient medication chart, order relevant pathology tests, and complete appropriate documentation in medical records.

The decision to initiate and cease treatment with an aminoglycoside or vancomycin was made by a doctor. Doctors, nurses or general pharmacists referred to a credentialed pharmacist, who prescribed doses on the inpatient medication chart. Credentialed pharmacists requested relevant pathology tests, and used pathology results and DoseMe pharmacokinetic modelling software to prescribe appropriate dose adjustments.

During the first six months, fourteen referrals for vancomycin and one referral for gentamicin were accepted. Credentialed pharmacists ordered drug levels eight times, prescribed dose changes four times, and provided advice about appropriate timing of pathology tests six times. Pharmacists transitioned two patients to continuous vancomycin infusions prior to HITH discharge.

Conclusion Credentialed pharmacists contributed to multidisciplinary patient care through pharmacist-led prescribing and monitoring of selected antimicrobials.

179 TO CONTINUE OR NOT TO CONTINUE PERIOPERATIVE OPIOID SUBSTITUTION THERAPY, THAT IS THE QUESTION!
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Background Perioperative pain management in opioid substitution therapy (OST) patients is complex due to opioid tolerance and increased pain sensation associated with opioid-induced hyperalgesia. Buprenorphine OST patients particularly, have been managed inconsistently due to the perceived ceiling effects of buprenorphine.

Aim To assess pain management practice in surgical OST patients at a leading tertiary public hospital.

Methods A retrospective audit of surgical patients receiving OST was conducted using data from dispensing data electronic and medical case notes. Data were collected for eligible methadone OST and buprenorphine OST
surgical patients over a period of 5 years between 2011 and 2016, using a standardised data collection tool and Redcap®. Statistical analysis was performed using MS Excel® and SPSS® 25.

Results A total of 45 patients were included, with 69% in the buprenorphine group and 31% in the methadone group. The buprenorphine group was primarily assessed due to the methadone group being underpowered for analysis. Mean postoperative opioid requirements were markedly higher in patients when the buprenorphine OST was held prior to surgery. A statistically significant increase in recorded pain score was observed in the group when buprenorphine OST was held prior to surgery compared to those whose therapy was continued. Despite the recommendation of addition non-opioid adjuvant analgesia, only 61% of the group received any form of non-opioid adjuvant therapy.

Conclusion Current evidence supports buprenorphine having no ceiling effect in analgesia. This, along with our findings, indicates a review of guidelines and practice to support continuation of buprenorphine OST peri-operatively is warranted.

Methods Three Canadian deprescribing algorithms (benzodiazepines, proton pump inhibitors (PPIs) and antipsychotics) were adapted with permission, for Australian registered drugs. Pharmacists identified patients on admission for inclusion if: age ≥ 70, on an inpatient ward, on a study drug with recommendation to deprescribe per the algorithm and provided consent. Follow up calls were made at 7-days and 3-months post deprescribing to survey symptoms, deprescribing status and opinion of the process.

Results Of 67 patients identified, 51 were recommended for deprescribing. 39 consented (31% benzodiazepines, 64% PPIs, 4% antipsychotics). An increase in symptoms after deprescribing was reported in 15% at 7 days and 20% at 3 months. Due to inability to contact patients (12%), follow up information could not be collected. A third had cognitive impairment and were unable to complete the follow up questionnaire. A benefit was noticed by 12% at 7 days, this reduced to 5% at 3 months. At 3 months 23% had a reduced dose and 33% ceased the drug. The patient information leaflet was helpful (100%). Patients reported no harm.

Conclusion Deprescribing of inappropriate medications in the elderly remains challenging, particularly benzodiazepines. Although we demonstrated only 5% of patients’ perceived benefit from the deprescribing process at 3 months, 56% had either a dose reduction or ceased the medication completely. There is potential for large healthcare system savings including decreased PBS expenditure and reduced adverse events.

180 EVALUATING SHORT AND LONG-TERM OUTCOMES OF HOSPITAL LED DEPRESCRIBING IN THE ELDERLY
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Aim To deprescribe three drug classes in elderly patients while hospital inpatient and evaluate short and longer-term outcomes.

Methods The ward round was undertaken monthly by a senior medical officer (SMO) and clinical pharmacist in a 57-bed rural hospital. Implementation was achieved using existing resources. Data collection occurred between April 2017 and June 2018. All inpatients prescribed antimicrobials were assessed using the National Antimicrobial Prescribing Service (NAPS) standardised data collection tools and classifications. Complex cases were discussed with the tertiary infectious diseases team per local hospital and health service policy. Recommendations were conversed with the individual treating doctors. Antimicrobial orders were assessed for compliance against Therapeutic Guidelines, microbiology results and local antimicrobial formulary restrictions; and assessed for appropriateness with regards to dose, duration, frequency and route. The annual NAPS audit data were reviewed before and after implementation to measure overall impact. An electronic tool was used to collect data.

Results To date, fifteen ward rounds have been conducted, encompassing 104 patients on 146 antimicrobials. Flucloxacinill was the most commonly prescribed antimicrobial with cellulitis as the most common indication. 85% of orders were considered appropriate with a total of 65 recommendations made. NAPS audit data increased from 64.3% appropriate prescribing in 2016 to 83.9% in 2017.

Conclusion Despite high levels of appropriate prescribing there is room for optimisation. A major benefit of this ward round has been the SMO-led education of prescribers around antimicrobial choice.

181 IMPLEMENTING AND EVALUATING A MULTIDISCIPLINARY ANTIMICROBIAL STEWARDSHIP WARD ROUND IN A RURAL HOSPITAL
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Aim To determine if a multidisciplinary antimicrobial stewardship (AMS) ward round in a rural hospital improves antimicrobial prescribing.
VALIDATING A PROPOSED STATE-WIDE MEDICATION INCIDENT CLASSIFICATION SYSTEM

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Aim To assess the correlation of responses in classifying medication incident scenarios, as part of development of a state-wide medication incident classification system (taxonomy).

Methods Health professionals were invited to test the proposed taxonomy by classifying 10 medication incident scenarios, and to provide feedback on the taxonomy using an online survey. For each scenario, respondents selected the relevant medication management process (e.g. prescribing/charting), then the incident type related to that process (e.g. wrong dose). Responses to each scenario were analysed for correlation to other respondents and investigator classification, and other feedback was analysed according to theme.

Results A total of 120 responses were received (87 complete; 33 partial) from various disciplines and roles in medication incident reporting/review. Six of the 10 scenarios had strong response correlation, including a scenario where the wrong antibiotic was supplied where all respondents (n=101) selected the ‘dispensing/supply process and 94% (95/101) the ‘wrong medicine/fluid’ incident type. Four scenarios had weak correlation of responses, requiring discussion by a working group to reach consensus and inform changes to terminology and/or incident types within the proposed taxonomy. For example, incident classification of a crushed sustained release tablet. Qualitative feedback related to the overall taxonomy (e.g. ease of use), specific scenarios or the scenario testing process.

Conclusion Using scenario testing to refine a proposed medication incident taxonomy resulted in terminology and incident types that are intuitive for end users. This has the potential to improve consistency in classification and quality of data used for identification of patient safety issues.

DEVELOPMENT OF A MEDICATION INCIDENT CLASSIFICATION SYSTEM TO STANDARDISE REPORTING IN CLINICAL PRACTICE

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Aim To develop a state-wide taxonomy, aligned to an adapted medication management cycle, designed to standardise medication incident reporting in clinical practice.

Methods Established medication incident taxonomies were identified through a literature review, professional societies and other Australian states/territories. Key existing taxonomies were mapped by medication management processes and related incident types, from which a first draft of the taxonomy was written. Using an iterative review process, a working group agreed on definitions and refined the taxonomy to achieve initial consensus. Scenario testing was then completed by a wider stakeholder group to assess correlation of medication incident classification responses using the draft taxonomy, and obtain further feedback. Responses were considered by the working group and used when finalising the consensus taxonomy.

Results The medication incident taxonomy outlines incident types aligned to seven medication management cycle processes; prescribing/charting, dispensing/supply, storage/handling/disposal, administration, monitoring, clinician communication/handover, and provision of information to patients. A classification guide provides definitions and examples to improve consistency in user-classification. The guide recommends classifying medication incidents based on the impact to the patient.

Conclusion This Australian-based medication incident taxonomy is directly applicable for use within clinical practice. It provides a good foundation for standardising medication incident data to inform development of medication safety systems to reduce the risk of preventable patient harm.

PARTNERING WITH CONSUMERS TO ASSESS AND IMPROVE SATISFACTION AND UNDERSTANDING OF MEDICINE LISTS

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Aim To assess patient satisfaction and understanding of medicine lists produced by Pharmacy.

Methods The formatting and content of medicine lists produced through the dispensing program was updated based on patient feedback, particularly that explanation of side effects could be improved. An ‘Important Information’ section was added outlining the most common and significant side effects and education points for approximately 150 commonly dispensed medicines. To assess this an anonymous survey was distributed to adult inpatients or carers that received a list with at least one medicine with ‘Important Information’. Participants rated their satisfaction and understanding of the different sections of the list using Likert Scales and could add free text comments.

Results Forty-six survey responses were received. The average age was 59 years and the majority of participants had completed at least high school level of education, and spoke English as their...
primary language. Overall, there was a positive response to questions related to understanding (96.7%) and satisfaction (95%). For all the components of the medicine list evaluated, the majority strongly agreed that the section was useful and comprehensive. Over 97% of respondents agreed or strongly agreed that there was the right amount of information in the ‘Important Information’ section. Comments provided were almost all positive, with very few suggestions for further improvement offered.

Conclusion Overall, patients were satisfied with and understood the medicine list provided. Patient feedback supports continuation of the changes implemented and further partnering with consumers to expand the database of medicines containing ‘Important Information’.

185 CAN LOW-DOSE METHOTREXATE CAUSE SEIZURES?

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Objective To describe a rare case of seizures associated with low-dose methotrexate (LDM).

Clinical Features A 35-year-old Caucasian woman with a history of epilepsy was diagnosed with psoriatic arthritis and started on methotrexate 10mg weekly. Five days after her second dose she had a seizure. She had been seizure free for the last five years while on topiramate.

Interventions A literature search was conducted to investigate the association of LDM with seizures. Epilepsy is not listed as a warning or precaution to the use of methotrexate. The product information (PI) states convulsions have been reported following intravenous and intrathecal use for chemotherapy. However, the US PI states convulsions have occurred during treatment for rheumatoid arthritis (RA) and psoriasis. There are two published case reports of seizures from LDM both in patients who had no history of seizures. A 44-year-old woman had three seizures over three weeks, one month after her dose of methotrexate was increased from 10mg to 15mg/week for her RA. In the second case, a 62-year-old man developed seizures six weeks after starting methotrexate 7.5mg/week for RA. Methotrexate was ceased and he remained seizure free after follow-up for three years.

Case Progress and Outcomes Her dose of topiramate was increased. The methotrexate was ceased and she remains seizure free one year later.

Conclusion This case highlights LDM may rarely cause seizures. The pharmacist had an important role in confirming the neurologist’s suspicions to ensure optimal medication management for this woman.

186 THE TYPE AND NATURE OF PHARMACIST RECOMMENDATIONS IN A HEALTHY AGEING CLINIC

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Aim To evaluate the impact of introducing a clinical pharmacy service to a geriatric outpatient clinic.

Methods Patients seen in the ‘Healthy Ageing’ outpatient clinic between November 2017 and June 2018 were investigated. Information collected included: pharmacist reviews, number of medicines, administration aids, recommendations made and education provided.

Feedback was sought from doctors and patients via survey to assess the value of the service.

Results 94% (n=99/105) of patients that presented to the clinic were reviewed by the pharmacist. The average number of medications taken was 8.9.

42.4% of patients utilised administration aids, with many patients also receiving assistance to manage medicines.

The total number of recommendations from pharmacy reviews was 189. 37.5% was of moderate clinical importance and 4.2% was of major clinical severity.

Deprescribing was the most common recommendation (25.9%), including high risk classes of medicines: benzodiazepines, antipsychotics, anticholinergics and NSAIDs. 25.9% of interventions related to patient-specific issues such as adherence, tailored counselling and liaising with community providers.

100% of doctors fed back that pharmacist input was beneficial for patient care in the clinic.

Due to a high proportion of cognitive impairment and time constraints of the clinic, patient feedback was difficult. Of 6 surveys completed all feedback was positive.

Conclusion The pharmacist primarily made recommendations around deprescribing high risk medications. Many of the interventions can have positive impact on patient health literacy and quality of life.

187 HIGH VANCOMYCIN DOSES REQUIRED FOR CRITICALLY ILL AUSTRALIAN INDIGENOUS PATIENTS

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Aim The rates of methicillin-resistance in Staphylococcus aureus infections are over 50% in a remote area in Australia.
This study aimed to describe the pharmacokinetics of vancomycin in critically ill Indigenous patients and advise an optimal dosing strategy.

**Methods** A population pharmacokinetic study was conducted in a remote intensive care unit. Serial plasma samples were collected over one dosing interval and assayed by validated chromatography. Concentration-time data collected were analysed using Pmetrics. The final pharmacokinetic model was then used for Monte-Carlo dosing simulations to determine optimal loading and intermittent maintenance doses.

**Results** Fifteen Indigenous subjects (8 females) were included for analysis with a median (IQR) age, weight and creatinine clearance (CrCL) of 43 (34–46) years, 73 (66–104) kg and 99 (56–139) mL/min respectively. A two-compartment model described the data adequately. Median CL, Vc, distribution rate constants from central to peripheral, and from peripheral to central compartment were 4.6 (3.8–5.6) L/h, 25.4 (16.1–31.3) L, 0.25 (0.12–0.37) h−1 and 0.28 (0.52) h−1 respectively. Therapeutic loading doses were significantly dependent on both weight and CrCL whereas maintenance doses were dependent on CrCL. In the absence of severe renal impairment, initiation of maintenance dose 8 hours post loading dose achieved higher probability of target attainment at 24 hours. Doses up to 2g every 8 hours may be needed when CrCL exceeds 130mL/min.

**Conclusion** This is the first report of vancomycin pharmacokinetics in this patient group. Descriptions of patient weight and CrCL were the most prominent determinants of optimised dosing regimens.

188 THE ROLE OF LINEZOLID THERAPEUTIC DRUG MONITORING (TDM) IN MULTI-DRUG RESISTANT TUBERCULOSIS (MDR-TB)

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**Objective** To perform TDM to characterise the pharmacokinetic (PK) profile of linezolid and to guide safe and effective dosing in MDR-TB.

**Clinical Features** A 50-year-old Vietnamese male was admitted for the management of progressively worsening MDR-TB on a background of type 2 diabetes. His treatment was complicated by a history of medication non-compliance, prolonged QTC in the setting of moxifloxacin and clofazimine, and sensorineural hearing loss and renal impairment secondary to amikacin. Following concerns of linezolid toxicity, TDM was performed to guide safe and effective dosing.

**Intervention, Case Progress and Outcomes** TDM was performed targeting a total drug area under the curve/minimum inhibitory concentration (AUCO-24/MIC) > 130–154mg/L/hr and trough (Cmin) <2mg/L. Serum levels were obtained at time 0, 2, 4, 6, 10 and 14 hours post-dose. However, the results did not capture an evident peak concentration (Cmax) and not utilisable to calculate the AUC. Repeat serum levels were obtained at time 0, 2, 4, 6, 10 and 14 hours post-dose. The time to maximum concentration (Tmax) was 4 hours, and the AUCO-24/MIC manually calculated as 143 mg/L/hr.

**Conclusion** Whilst linezolid has been characterised to display almost linear PK in healthy adults, the PK profile in TB patients is poorly understood. Linezolid's PK has shown significant inter-patient and intra-patient variability in different populations. In our case report, the Tmax demonstrated delayed absorption, deviating from the reported averages in healthy adults. TDM has an important role in developing individualised linezolid dosing - minimising the risk of toxicity or therapeutic failure in the treatment of MDR-TB.

189 ULTRARAPID IRON POLYMALTOSE INFUSION FOR IRON DEFICIENCY ANAEMIA (ULTRARIPH): A PILOT SAFETY STUDY

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**Aim** Treatment of iron deficiency is often achieved via a single administration of intravenous iron polymaltose as a prolonged infusion or multiple infusions of more rapidly administered products. This study aimed to examine the safety of iron polymaltose for total body iron replacement administered as ultrarapid infusions.

**Methods** This was a prospective, open-label, cohort study of up to 1500 mg of iron polymaltose administered over 30 minutes in 10 patients, followed by administration over 15 minutes in another 10 patients. All patients requiring iron replacement were consented to participate at a single tertiary centre. Adverse events were graded as mild, moderate or severe with monitoring during the infusion and at follow-up a week later, and compared using chi-squared.

**Results** Twenty patients were enrolled into the study within 2 months (2017–2018). The average dose for the total cohort was 1110 mg, with no significant difference between doses in each group (p=0.228). Three patients in each group experienced 4 mild adverse events during the infusion. During the follow-up period, 2 patients in each group experienced adverse effects, with 1 patient in each group experiencing a moderate adverse effect requiring treatment with paracetamol. The safety outcomes of ultrarapid infusions were similar to both 4-hour and 1-hour infusions of iron polymaltose, as well as to ferric carboxymaltose.
**Conclusion**

Ultrarapid iron polymaltose infusions showed similar safety to rapid and standard infusions in this pilot study. Further, fully powered, studies of ultrarapid iron polymaltose are warranted given the safety results of this pilot study.

190 **LONG-TERM OPIOID USE IN HEPATIC IMPAIRMENT IS ASSOCIATED WITH ADVERSE OUTCOMES**

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**Aim**

To examine hospitalisation and mortality associated with long-term opioid use in a cohort of hepatically impaired patients.

**Methods**

A retrospective audit of adult patients admitted under a hepatologist in January and February 2016 was conducted using integrated electronic Medical Records. Patient outcomes were collected over a 12-month follow-up period. Opioids were converted to oral morphine equivalent daily dose (oMEDD). A multivariable logistic regression model was developed (using stepwise backwards logistic regression to identify significant factors for inclusion in the model) to predict outcomes. All p-values were 2-sided and statistical significance was set at alpha=0.050.

**Results**

Eighty-five eligible patients were identified. Mean age (±SD) was 53.3 (±12.0) years, 65.9% were male, and most patients had alcoholic liver disease (25.9%) or hepatitis C (41.2%). Sixty-one patients (71.8%) had cirrhosis. Twenty-two patients (25.9%) were prescribed an opioid on discharge from the initial admission period. Opioids were converted to oral morphine equivalent daily dose (oMEDD). A multivariable logistic regression model was developed (using stepwise backwards logistic regression to identify significant factors for inclusion in the model) to predict outcomes. All p-values were 2-sided and statistical significance was set at alpha=0.050.

**Objections**

People with liver disease who are taking opioids are at higher risk of hospital admissions and death. Individualised patient assessment and clinical judgment is essential when prescribing opioids in this population.

**Conclusion**

Clinical infusions showed similar safety to rapid infusions in this pilot study. Further, fully powered, studies of ultrarapid iron polymaltose are warranted given the safety results of this pilot study.

191 **FLUID AND POTASSIUM REPLACEMENT DURING AMPHOTERICIN TREATMENT: WHEN JUST A LITTLE BIT WON’T DO**

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**Background**

Treatment of cryptococcal meningitis with prolonged intravenous (IV) amphotericin poses a challenge in managing acute kidney injury (AKI) and electrolyte disturbance, both common and serious complications of therapy.

**Objective**

To describe two cases where pharmacist input was integral to managing considerable fluid and electrolyte replacement during amphotericin therapy.

**Clinical Features**

Patient 1 is a 25-year-old male (weight 119kg, height 185cm) with cryptococcal meningitis treated with amphotericin for 29 days (conventional – 5 days, lipid complex – 24 days).

Patient 2 had significant AKI during amphotericin therapy, responsive to large volume IV fluid replacement up to 10L/day. Due to the long half-life of amphotericin, IV fluids continued for 2 weeks post-treatment with gradual transition to an oral fluid target.

**Conclusion**

AKI and profound electrolyte disturbance are significant challenges of amphotericin therapy requiring proactive and intensive fluid and electrolyte replacement. Awareness of the ongoing nature of deficits and careful planning of daily fluid and electrolyte management are key to preventing complications.

192 **EVALUATION OF NATURE, DOCUMENTATION AND COMMUNICATION OF CODED ADVERSE DRUG REACTIONS**

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**Aim**

To evaluate the nature, documentation and communication of ADRs coded at a tertiary referral, metropolitan hospital between January and December 2016.

**Methods**

All patients with an ICD Y40-Y59 code were identified and a random sample of 126 patient charts were audited. Naranjo algorithm, Hartwig’s scale and the Schumock and Thornton scale were applied to assess likelihood, severity and preventability of ADRs. ADRs were classified as an allergic reaction, side-effect or intolerance.
Prescribing in Small Australian Hospitals used to retrospectively identify principal diagnoses for small Australian hospitals. The Patient Journey Prescribing Assessment (PJPA) was defined as the method of review whilst limiting resources required for this purpose, with the aim of increasing validity of data, and reducing bias. The study involved a prospective study of patients admitted to a regional hospital in Queensland, Australia. All patients were assessed using the PJPA methodology and compared to current methods. The PJPA methodology identified 4 to 14 times more prescriptions for each of the indicated data points. Results: The PJPA methodology identified a larger number of prescriptions and took less time to complete compared to the "Once-a-Week" methodology (337 versus 75 prescriptions, 67 versus 32 patients and 42 versus 54 hours). PJPA identified 4 to 14 times more prescriptions for each of the indicator data points. 100% of prescriptions in PJPA method (N=337) could be used to inform QI indicators compared to 75% of "Once-a-Week". Conclusion: The PJPA method offers an alternative audit methodology offering greater prescription ascertainment to inform standard benchmarking and quality improvement indicators compared to current methods.
Conclusion Prescriber adherence to COPD-X guidelines and patient adherence on admission in this setting is poor. A clinical pharmacist COPD checklist is under development as part of a multidisciplinary approach to optimise COPD management.

195 PLASMAPHORESIS/EXCHANGE (PLEX) AND LEVETIRACETAM DOSING – ARE FIRST PRINCIPLES ACCURATE?

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Objective Describe effects of PLEX on levetiracetam.

Clinical Features 24-year-old Caucasian female with multiple sclerosis treated with alemtuzumab. New onset focal seizures characterised by neck and tongue twitching resulted in referral to ED and progression to two tonic-clonic seizures. Provisional differential diagnoses were partial status epilepticus and alemtuzumab-associated immune reconstitution.

Interventions, Case Progress and Outcomes During a prolonged ICU stay requiring invasive ventilation and deep sedation, refractory seizures occurred. Remarkable workup included: EEG (epileptiform activity), MRI (new, progressing lesions). Alemtuzumab-associated autoimmune encephalitis was suspected. Management included: multiple antiepileptics, IV methylprednisolone 1g 5/7 with ongoing prednisolone orally, IV immunoglobulin 5/7 and 5 PLEX courses.

Prior to PLEX the ICU pharmacist investigated its potential effects on antiepileptic drug levels. Literature recommendations are limited. Pharmacokinetic characteristics of drugs likely to be removed: high protein binding (PB) and/or Vd<0.2L/kg. Literature suggests carbamazepine/valproate are not removed, others are based on first principles: levetiracetam (low PB, Vd=0.5–0.7L/kg, removal unlikely); gabapentin (low PB, Vd=0.8L/kg, removal unlikely); clonazepam (can be given PRN). Baseline, post-PLEX and trough levels were taken, following pharmacist advice.

Levels showed neither agent dramatically removed. Doses were unaltered. Slight removal of carbamazepine was seen. Levetiracetam levels were low throughout showing slight rebound at first trough post-PLEX, possibly owing to redistribution from fatty tissue (baseline=6mg/L, post-PLEX=4, post-PLEX trough=5, NR=12–46). Reporting delays prevented level-related dosage adjustment.

Conclusion First principles appear useful in guiding levetiracetam dosing recommendations for PLEX, no dramatic removal. Ideally monitor levels when seizure control is crucial. Reduced reporting times would enhance clinical relevance.

196 METABOLIC BONE DISEASE OF PREMATURITY – A NEW PROTOCOL FOR DETECTION, DIAGNOSIS AND TREATMENT

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Aim Metabolic bone disease of prematurity (MBDP) may lead to rickets, fractures and poor growth in preterm infants. There is lack of consensus guiding MBDP management. A local protocol introduced in January 2017 recommends screening and treatment with 2mmol/kg/day of oral calcium and phosphate. This study aimed to evaluate protocol compliance, tolerability, and compare treatment rates with pre-protocol trends.

Methods A retrospective cohort study was conducted on infants born February 2017–January 2018 at either <28 weeks gestation or birth weight <1000g. As per protocol, diagnostic testing was conducted for low phosphate<1.8mmol/L and high ALP>600units/L on day-28, 42, 60 and 36-weeks’ corrected age. Medical records were reviewed for pathology, dosing and adverse effects. Relevant prescribing data were compared to pre-protocol treatment rates (34.9%) and mean treatment duration (29 days).

Results Ninety-five infants had medical records available, received day-28 testing, and met inclusion criteria. Compliance to re-testing was suboptimal, with 79 of 95 (83.2%) infants re-tested on day-42 (±5 days). Forty-one of 95 (43.2%) infants demonstrated abnormal results and all received treatment. Forty of 41 (97.6%) treated infants were prescribed correct doses, with 36 (87.8%) prescribed treatment within 5 days of abnormal pathology. Observed mean treatment duration was 40 days. Nil adverse effects were reported.

Conclusion The new protocol has shown promise in improving detection, diagnosis, and treatment for MBDP. Dosing compliance and treatment tolerability appeared unproblematic, though subsequent re-testing beyond day-28 was inconsistent, therefore requiring pharmacist vigilance. Further studies are required to investigate apparent increased treatment rates, duration, and long-term treatment outcomes.

197 MEDICATION-RELATED EMERGENCY DEPARTMENT RE-PRESENTATIONS: CHARACTERISING THE MEDICATION-RELATED PROBLEMS AND EXAMINING THE PHARMACIST’S ROLE

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Aim To identify and categorise medication-related 28-day Emergency Department (ED) re-presentations; to examine pharmacist interventions performed during the initial admission and re-presentation; to inform future...
strategies to improve medication-related re-presentation rates.

**Methods** Retrospective medical record reviews were conducted for every third adult ED re-presentation within 28 days of discharge, between 1/7/2016 and 31/12/2016. Re-presentations were examined for potential medication-related causes. Medication-related problems (MRPs) and pharmacist interventions were categorised using validated criteria.

**Results** From 631 eligible re-presentations, 196 were sampled. Re-presentations were potentially medication-related in 41 (20.9%) cases; 32 (78.1%) were considered preventable. Early re-presentations were common; 48.8% occurred within 7 days of discharge, and 19.5% on day 1. Patients re-presenting with a MRP were on average 10.3 years older, and prescribed 3.4 more medications on initial discharge, than non-medication-related re-presentations. Cardiovascular medications (n=14, 31.8%) were most commonly implicated in MRPs, with 'toxicity/adverse reaction' (n=16, 36.4%) and 'undertreated' (n=15, 34.1%) common MRP categories. Patients with medication-related re-presentations were more likely to have received pharmacist services during their initial admission, including Best Possible Medication History, medication reconciliation, pharmaceutical review, interventions, and Discharge Medication Records. The most common intervention categories were regarding nervous system (n=14, 22.2%) and blood-related (n=13, 20.6%) medications, with 'drug selection' (n=14, 22.2%), 'over-/under-dose' (n=13, 20.6%), 'compliance' (n=12, 19.1%), and 'undertreated' (n=16, 25.4%) MRP groups most frequent.

**Conclusion** A large proportion of 28-day ED re-presentations are medication-related, almost 80% of which are preventable. Activities such as early pharmaceutical review post-discharge may assist in reducing the wide array of MRPs observed.
almost all interventions (96%) related to improving patient safety. 57% of interventions related to opioids. The intervention was actioned by the medical officer 72% of the time.

Conclusion Results were presented at hospital Grand Rounds, highlighting the need to formalise our multidisciplinary Analgesic Stewardship team to tackle this epidemic. Pharmacists are an integral member of the Analgesic Stewardship team. It’s time for all hospitals to invest in Analgesic Stewardship to improve opioid vigilance and prevent patient harm.

200 MEASURING THE EFFICIENCY AND EFFECTIVENESS OF TEAM-BASED PHARMACY TECHNICIANS: A TIME AND MOTION STUDY

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Aim To determine the efficiency and effectiveness of team-based pharmacy technicians.

Methods Pharmacy technicians were shadowed for 9 days and the time taken to perform tasks were classified into 13 activity types. Timeliness of non-impest medication supply was determined and compared with a state-wide time critical medicines list. Accuracy and timeliness of adverse drug reaction management was also recorded.

Results The four activities where most average time spent per day was-impest duties (88 minutes), individual inpatient medicine supply (79 minutes), travel between activities (38 minutes), and other tasks (34 minutes). Approximately 30 minutes per day were spent on administrative tasks, stock maintenance, prescription dispensing and adverse drug reaction (ADR) management. Technicians spent 21 minutes per day providing clinical handover to pharmacists. All medications that must be administered immediately (n=22) were delivered on time and only 4% (n=4) of medications which must not be omitted were delivered later than 2 hours after the scheduled dose. Pharmacy technicians input or updated 95% of documented and pharmacist confirmed ADRs accurately into the relevant hospital clinical information systems within the first 24 hours of patient admission.

Conclusion Team-based pharmacy technicians effectively and efficiently support the clinical pharmacy service. This model of care supports timely supply of non-impest medications and accurate and timely input of ADRs into relevant hospital clinical information systems. These activities free pharmacist time for provision of clinical activities.

201 BREAKING INTO PRISON

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Twelve months ago, a metropolitan hospital’s Pharmacy Department endeavoured to implement a clinical pharmacy service in a 1400 inmate correctional centre. The provision of healthcare at the centre is complicated by very limited space in the medical centre, high numbers of medication doses per day, high turnover of the prison population and the obvious security arrangements. As a result, a need was identified to expand the medication safety systems currently in place in the directorate to ensure adequate support for the staff at the correctional centre.

With a two-day-a-week on-site presence, significant progress has been made over the last twelve months. Over 500 medication charts have been reviewed with a priority referral system implemented. Restricted access to prisoners (at best twice daily dosing rounds) has required the development of tailored best practice guidelines. An audit schedule has been implemented for the medication systems currently in place as well as a system of reporting medication incidents back to the medication safety committee.

The experience gained by having an on-site presence at the prison has put the Pharmacy Department in a great position to move forward and expand the service in the near future. Plans to contribute to the roll out of a comprehensive hepatitis C treatment program are in process, as well as preliminary investigations into a complete dose packing system. This poster aims to provide an insight to the challenges and opportunities for pharmacists daring to work behind bars.

202 ANTIMICROBIAL DOSING IN CRITICAL CARE: A PRAGMATIC DOSING GUIDELINE

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Aim To develop, implement and assess compliance of an antimicrobial dosing guideline.

Methods An extensive literature review was conducted to establish the guideline, and data were identified by searches of Medline, Embase, and references from relevant original articles. Search terms for each antibiotic (flucloxacillin, cefepime, cefazidime, meropenem, piperacillin/tazobactam, and vancomycin) included: pharmacokinetics, pharmacodynamics, penetration, augmented renal clearance, obesity, critically ill, continuous infusion, prolonged infusion, monte carlo, renal impairment, renal replacement therapy, hepatic impairment, acute kidney injury, mortality, and outcome). A draft guideline was written and presented to Intensive Care and Infectious Diseases consultants and the Antimicrobial Stewardship Team for feedback. The guideline was then endorsed by the medicines committee prior to education and utilisation of the guideline in clinical practice.
Once implemented, drug orders were assessed for compliance over a 4-week period beginning May 2018. Patients admitted over the study period were retrospectively assessed and included if they received any of the guideline drugs.

Results Overall 68% (34/50) of drug orders were in line with the guideline. Individual results were: piperacillin/tazobactam 71% (17/24); vancomycin loading dose 90% (9/10); vancomycin maintenance dose 29% (2/7); cefepime 75% (3/4); meropenem 100% (3/3); flucloxacillin 0% (0/2).

Conclusion An easy-to-use and up-to-date antimicrobial guideline was developed, implemented and retrospectively assessed. Overall drug orders aligned with the guideline, and results support the need for focused education and ongoing guideline development. A prospective observational study is planned to validate the guideline in terms of concentration attainment, clinical outcomes, and comparison to therapeutic drug monitoring-based dosing.

203 AN AUDIT OF THE DOCUMENTATION OF NEW ORAL ANTICOAGULANTS

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Aim To determine the completeness of new oral anticoagulant (NOAC) documentation by the healthcare team.

Methods A retrospective chart audit of all inpatients discharged on a NOAC during a one-week period was performed. NOAC documentation on the National Inpatient Medication Chart (NIMC), Medication Action Plan (MAP), Discharge Medication Record (DMR) and discharge summary were recorded.

Results Twenty-three patient charts were reviewed. The specific NOAC indication was documented on 41% of the MAPs, 94% of the NIMCs, 0% of the DMRs and 44% of the discharge summaries. NOAC commencement date was documented on 18% of the MAPs, 6% of the NIMCs, 9% of the DMRs and 6% of the discharge summaries. The intended duration of therapy was documented on 0% of the MAPs, 6% of the NIMCs, 14% of the DMRs and 25% of the discharge summaries. On the NIMC, “anticoagulant” was written as the indication in 41% of patients. The indication on the NIMC was predominantly documented by pharmacists (81%). Nil patient charts had documented the provision of a NOAC book or patient education. The VTE prophylaxis section of the NIMC was marked as contraindicated in 61% of cases. This was documented by prescribers in 29% of cases, pharmacists in 50% and both in 21%.

Conclusion Documentation of NOAC indication was performed well on the NIMC. There is room for improving documentation of NOAC commencement date and intended duration of therapy, which is critically important when transferring patient care from hospital to the community.

204 POST-OPERATIVE OPIOID PRESCRIBING TRENDS ON DISCHARGE: A RETROSPECTIVE AUDIT

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Aim To identify and evaluate trends in opioid prescribing on discharge following orthopaedic and plastic surgery.

Methods A retrospective audit of discharge prescriptions from Orthopaedic Surgery (OS) and Plastic Surgery (PS) units was conducted between July and September 2017 at a metropolitan teaching hospital. Opioids prescribed on discharge were compared to inpatient opioid requirement and pain score. Patients taking opioids for chronic conditions were excluded.

Results Opioids were prescribed on discharge in 87% (299/342) of OS and 59% (148/250) of PS patients. The most commonly prescribed opioid was oxycodone immediate release. Opioid doses prescribed on discharge were higher compared to doses administered 24 hours prior, in 66% (197/299) of OS and 37% (55/148) of PS patients.

A pain score of zero was reported in 42% (143/342) of OS and 66% (164/250) of PS patients 24 hours prior to discharge, however 74% (106/143) and 35% (57/164) of these patients, respectively were prescribed opioids on discharge.

Slow-release opioids were prescribed on discharge in 22% (133/592) of patients, with oxycodone/naloxone modified-release tablets most commonly prescribed. Duration of supply of opioids exceeding seven days was prescribed in 26% (157/592) of patients.

Conclusion Audit results indicate opioid prescribing practices require improvement. A multi-modal approach consisting of clinician education, implementation of opioid prescribing guidelines and opioid stewardship program are indicated. There is potential for scope of practice change with pharmacist initiating discharge prescriptions to improve opioid prescribing.

205 ACUTE GENERALISED EXANTHEMATOUS PUSTULOSIS (AGEP) SECONDARY TO TEICOPANLIN IN A PATIENT ABLE TO TOLERATE VANCOMYCIN

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Aim To identify and evaluate trends in opioid prescribing on discharge following orthopaedic and plastic surgery.

Methods A retrospective audit of discharge prescriptions from Orthopaedic Surgery (OS) and Plastic Surgery (PS) units was conducted between July and September 2017 at a metropolitan teaching hospital. Opioids prescribed on discharge were compared to inpatient opioid requirement and pain score. Patients taking opioids for chronic conditions were excluded.

Objective AGEP is a severe cutaneous adverse reaction and is not listed as a possible adverse event for teicoplanin in current Product Information. There is one published case report of teicoplanin-associated AGEP, involving a patient with cross-reactivity to vancomycin. We
present a case of AGEP occurring in a patient treated with teicoplanin who was able to tolerate vancomycin.

**Clinical Features** A 54-year-old Indigenous woman was hospitalised with an infected, gangrenous wound on her right foot. She had end stage kidney disease, type 2 diabetes mellitus and documented adverse drug reactions (aspirin, morphine, cefazolin). Piperacillin/tazobactam, trimethoprim/sulfamethoxazole, clindamycin, vancomycin and teicoplanin were administered prior to developing reaction symptoms. Despite the wound improving, the patient experienced continued fevers, leukocytosis and neutrophilia. Within 12 days of commencing teicoplanin, the patient developed severe pruritis and multiple, tiny pustules over her trunk, limbs, neck and scalp. Histology and symptoms were consistent with some unique features of AGEP.

**Interventions, Case Progress and Outcomes** Within 14 days of ceasing teicoplanin, AGEP symptoms resolved spontaneously and the patient experienced generalised desquamation. The patient received clindamycin and vancocin later without incident. The pharmacist involved in the care of this patient contributed to the identification of phacoaeriat involved in the care of this patient.

**Conclusion** This case report is the second reported case of teicoplanin associated AGEP, but differs in that the patient was able to tolerate vancomycin. It highlights the importance of identifying very rare, suspected drug reactions based on clinical assessment to avoid prolonged symptoms and unnecessary treatments.

206 THE HYPE ABOUT HYPERTHERMIC INTRAPERITONEAL CHEMOTHERAPY

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**Background** There have been significant advances over the past decade in Cytoreductive Surgery (CRS) and Hyperthermic Intraperitoneal Chemotherapy (HIPEC), where decision-making processes are multifaceted requiring an interdisciplinary approach to patient care.

**Aim** To assess pharmacist interventions in the perioperative period for patients undergoing CRS & HIPEC for the treatment of peritoneal surface malignancy.

**Methods** This study was a prospective audit of all patients that underwent CRS and HIPEC between May 2017 and May 2018. Pre-operatively, patients were reviewed by the CRS and HIPEC team comprising: surgeons, oncologists, pharmacist, dietitian, nurse and physiotherapist. The pharmacist documented the medication history and reviewed medications peri-operatively during transitions between the intensive care unit and the ward. Pharmacists interventions were recorded and analysed using an online database. Interventions recorded were: changes to drug, route, dose, frequency, medication list, duplicate and missing therapy.

**Results** Sixty patients underwent CRS & HIPEC during the study period. The chemotherapy agents prescribed were Mitomycin-C (45%), Cisplatin (8.33%), Oxaliplatin (45%), and a combination of Mitomycin-C and Cisplatin (1.67%). 71 pharmacist-initiated interventions reported (mean=1.2 interventions per patient). The most common interventions were unintentional drug cessations (15.5%) and omissions (15.5%). Other interventions included: therapeutic duplication (6.0%), intravenous to oral switch (6.0%) and anticoagulant errors (25%).

**Conclusion** The pharmacist plays a vital role on the interdisciplinary CRS and HIPEC team, formulating HIPEC protocols, preventing errors of omission and commission, therapeutic duplication, preparing medication lists, admission and discharge medication reconciliation optimising a safe transition of patient care.

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**Aim** To identify the significance of medication-related re-presentations/re-admissions (MRRR) from short stay unit (SSU) and day procedural unit (DPU), where minimal pharmacist presence exists; and establish whether pharmacy service expansion into these areas could potentially prevent these events.

**Methods** A retrospective audit was conducted utilising pre-generated reports of re-presentations/re-admissions from SSU and DPU in our hospital over April 2018. A fourth-year pharmacy student reviewed the patient medical records via an online records database. MRRR were analysed using Emergency department Information Systems (EDIS) and determined whether pharmacist intervention may have prevented the incident. All data collected and analysed were overseen by a senior pharmacist.

**Results** Ethics exemption was obtained from the student’s university. 93 re-presentations/re-admissions originated from SSU. 19 cases were MRRR, of which, 6 cases were confirmed to be potentially avoidable by pharmacist intervention. An additional 3 cases were identified to be potentially avoidable if a pharmacist provided counselling. 31 cases in SSU had pharmacist involvement at initial discharge, which included 4 cases that were MRRR.
9 re-presentations/re-admissions were identified for DPU. 2 cases were identified to be MRRR. Only 1 case was determined to be potentially preventable via pharmacist intervention. No pharmacy service is allocated for DPU.

**Conclusion** In the absence of a full pharmacy service, medication management in these high turnover units did not appear to significantly effect re-presentation/re-admission rates. Although, a pharmacy service may be beneficial in these units, our results discouraged the need for a pharmacy service in these areas, if purely to prevent MRRR.

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**208 OFF-LABEL USE OF CALCITONIN IN THE TREATMENT OF PHANTOM LIMB PAIN: A MINI CASE SERIES**

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**Objective** To explore and describe the use of calcitonin in phantom limb pain.

**Clinical Features**

Case 1: A 76-year-old Caucasian male underwent below knee amputation (BKA) following left leg ischaemia secondary to peripheral vascular disease.

Case 2: A 61-year-old Asian male underwent BKA following traumatic leg injury.

Post-operative pain management for both patients was managed with intravenous fentanyl, ropivacaine via a peripheral nerve block infusion, oral paracetamol and oral oxycodone. On day 2 post-surgery, both patients had a pain score of 7/10 and exhibited symptoms of phantom limb pain.

**Interventions, Case Progress and Outcomes**

Following consultation with the Acute Pain Service and pharmacy, a review of the limited literature on the treatment of phantom limb pain was conducted. Subsequently, a decision was made to trial calcitonin 100 microgram subcutaneously daily for three days. The mechanism of action of calcitonin in phantom limb pain is unknown but thought to be due to increased production of beta-endorphins.

Pain score decreased and phantom limb pain completely resolved for case 1. Case 2 required the addition of pregabalin 50mg twice daily before a reduction in pain score and frequency of phantom limb pain was reported.

**Conclusion** Phantom limb pain is a complex, difficult to treat and poorly understood pain syndrome. Due to the limited evidence on the use of calcitonin in phantom limb pain, further research is needed to optimise dosing, improve patient outcomes and guide future practice.

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**209 EMPIRICAL ANTIMICROBIAL THERAPY FOR URINARY TRACT INFECTIONS IN THE EMERGENCY DEPARTMENT: A RETROSPECTIVE AUDIT**

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**Aim** To review empirical prescription of antimicrobial therapy for urinary tract infections (UTI) in the emergency department (ED) and to identify the appropriateness of prescribing according to national guidelines.

**Methods** A retrospective audit of empirical antimicrobial prescribing by ED doctors was conducted by an ED pharmacist over a total of 4 weeks. Patients with listed diagnoses of pyelonephritis, urinary tract infection and cystitis were included in the audit.

Empirical prescribing for inpatient orders and discharge prescriptions was assessed using the National Antimicrobial Prescribing Survey tool to determine antimicrobial appropriateness and alignment with the Therapeutic Guidelines (TGs). A sample of cases were co-assessed by an emergency physician.

**Results** 77 patients and a total of 137 antimicrobial orders were reviewed. 93/137 orders (68%) were deemed appropriate.

115/137 (84%) of antimicrobials prescribed were consistent with empirical options listed in the TGs. 31/115 (27%) of these orders were deemed suboptimal or inadequate due to incorrect durations, doses and frequencies.

8/137 (6%) of antimicrobials prescribed were not consistent with empirical options listed in the TGs. This included cephazolin, amoxycillin and piperacillin/tazobactam.

Piperacillin-tazobactam was deemed inadequate empirical treatment for 2 patients who were colonized with extended-spectrum beta lactamase (ESBL) producing pathogens.

**Conclusion** UTIs are a common ED presentation. Preliminary results suggest that ED doctors often select appropriate antimicrobials, however significant deviation from consensus guidelines is observed regarding dose, duration and frequency possibly resulting in treatment failure and/or representations. Pharmacists are ideally placed to optimize antimicrobial prescribing and stewardship in the ED.
210 TRANSFER MEDICATION RECONCILIATION – LOST IN TRANSLATION!
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Aim To quantify the prevalence of medication errors and describe their classification for patients transferred from Intensive Care unit (ICU) to general wards where different Electronic Medication Management (EMM) systems are in use.

Methods Patients discharged from ICU (PHILIPS®) to general wards (Cerner PowerChart®) were identified via an electronic report run daily over a 10-day period. Pharmacists prioritised the review of these patients, and reconciled the medication orders and allergy status. Transcription errors between systems were identified and rectified with the medical teams.

Results Sixty-six patient transfers were eligible for inclusion with forty-five transfers available for analysis. A total of 58% of patient transfers had at least one medication error (n=26/45). The total number of medication orders reviewed was 449 which included 77 transcription errors, 18 of which involved high-risk medications. Errors of omission (18.2%) and commission (9.1%) were most common. Venous thromboembolism prophylaxis and allergy status were reconciled correctly in 96% of transfers (n=43/45).

Conclusion EMM systems should reduce medication error risk however the opposite effect can occur when systems do not interface. Transfers between ICU and general wards are particularly vulnerable. The high rate of transcription errors further demonstrates the need for medication reconciliation. Pharmacy services do not always allow for timely patient transfer medication reconciliation, even when systems exist to prioritise these patients. Despite increased collaboration between pharmacy and medical teams to reduce transcription errors, gaps in clinical services remain over weekends or afterhours highlighting the need to develop better interfaces to mitigate medication error risk.

211 OPTIMISING AN EMEDS SYSTEM USING A COMMUNITY OF PRACTICE APPROACH TO DELIVER PATIENT SAFETY BENEFITS
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Aim To evaluate the feasibility, impact and potential benefits of aligning a clinically led Community of Practice (CoP) group to manage a ‘risks and mitigation’s register with oversight from, the facilities medicine safety committee.

Methods CoPs have evolved over time to refer to groups of people who share a concern or a problem and who come together to interact, learn and create a sense of identity, and in the process, build and share knowledge and solve problems.

Our CoP group was established with the support of the facility medicines safety Committee and hospital executives. As a minimum, one champion or ‘Clinical Practice Lead (eCPL)’ as they were described locally, was identified from each ward, department or clinical specialty within the hospital.

The CoP group also included members from the eMeds project team and the facility medication safety committee.

CoP members were provided background information and training on the potential benefits and use of the CoP domain, which was built within a restricted SharePoint site called ‘TeamSite’.

Once launched, the approach was evaluated over an initial 8-week period.

Results Early results suggest strong interest from clinicians to continue using the approach. Key benefits seen were that clinical issues were detected and managed in a more timely manner.

Conclusion The results to date are suggestive that a CoP in a multi-facility context, could offer a superior way of monitoring the systematic and workflow element of the eMeds system. Further evaluation of the approach will be required.

212 THE EFFECTIVENESS OF INCIDENT REPORTING IN MANAGING MEDICATION SAFETY: DO VOLUNTARY REPORTING SYSTEMS NEED SUPPORT?
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Aim To evaluate the effectiveness of a voluntary clinical incident management system at managing medication safety.

Methods A single-day snapshot audit involved 13 clinical pharmacists using a succinct paper tool documenting brief information relating to medication incidents. Information was compared to estimated average daily reports, determined from the electronic database of the usual system. Pharmacists were then surveyed with questions requiring likert-scale or open-ended responses, incorporating perceptions of the usual system and paper tool effectiveness. Descriptive statistics and comparison of means (unpaired t-test) were used to analyse data.

Results When compared to the usual system, the paper-based audit identified 103-times more incidents, including up to 12-times more incidents reaching the patient. Most pharmacists identified the importance of incident reporting in improving patient safety (strongly agree 69%; agree 23%; neutral 8%). All agreed that more time/resources would support greater levels of reporting (strongly agree
69%, agree 31%). The most significant barriers to reporting were time (n=11), software restrictions (n=8), computer availability (n=6), and competing priorities (n=5). Most (85%) believed that brief documentation of many incidents was more valuable for improving safety than thorough documentation of fewer incidents. Pharmacists that agreed incident reporting was important in improving safety were less likely to identify time as a barrier to reporting (P<0.001).

**Conclusion** Results indicate that the method of reporting impacts reporting rates, with a trade-off between volume and level of detail reported. Results indicate that there may be an education gap in understanding of the value of incident reporting in improving patient safety.

**Introduction** Discharging patients from ICU to the general wards involves re-prescribing of medications from the ICU Clinical Information System (CIS) to the ward medication chart. Since implementation of hospital wide electronic prescribing using a different CIS, discharges now involve re-prescribing of medications from one CIS to another. Medication transcription or re-prescribing is a known risk factor for errors.

**Aim** To see what impact hospital wide digital prescribing has had on ICU discharges.

**Methods** An audit was performed pre and post digital implementation to review whether the change of process resulted in a change in error or intervention rates or severity.

**Results** Pre-digital there were an average of 1.13 errors or interventions per discharge. This increased to 1.8 per discharge after the hospital wide digital implementation. Interventions were assessed for severity with medical staff. On average 1 in 3 charts post-digital had an error classified as “Major” or “Significant” compared with 1 in 5 charts prior to digital commencement. Causes of errors remained similar between the 2 systems with straight Transcription Errors being highest, followed by Clinical Interventions or Knowledge Errors, Process Errors & System Errors. The increase in error rate is believed due to the increased complexity of the discharge process.

**Conclusion** Implementation of a hospital-wide CIS has changed the way patient discharges from ICU are processed. This has resulted in an increase in error and intervention rates. Audit results are being used to modify processes, registrar training & pharmacist staffing in order to minimise errors on ICU discharges.

**Results** The new app was hosted on the health service intranet. Close monitoring, necessitated by the risk associated with changes in high-risk medication management, assured its efficacy, usability and acceptance by staff.

Since implementation of the heparin app, no errors in heparin infusion titration administration have occurred.

**Conclusion** The introduction of an online dose calculator for heparin infusion dose titration was found to improve patient safety by reducing the incidence of human errors associated with rate changes and bolus injections as compared to a flow chart style decision matrix.

**Aim** To develop a nurse-led model for titration of heparin infusions with protection against common human errors.

**Methods** Critical incidents were analysed by a multidisciplinary team to determine the reasons behind errors and in which step of the administration process these occurred. The existing method required nurses to follow a titration formula that consisted of a large number of sequential steps dependent on the patient’s activated prothrombin time (aPTT). A national survey of nurses provided insight into their understanding of the conceptual flow of decision supported medication titration procedures. A heparin web application that included a dose calculator was developed.

**Results** The introduction of an online dose calculator for heparin infusion dose titration was found to improve patient safety by reducing the incidence of human errors associated with rate changes and bolus injections as compared to a flow chart style decision matrix.

**Aim** To evaluate the effectiveness of an alert targeting nursing staff attempting to administer NSAIDs to patients within 24 hours of a dose of parecoxib using an electronic medication management (eMM) system. The development and implementation of this alert was requested by the Drug and Therapeutics Committee (DTC) as a prerequisite for adding parecoxib to the formulary.
Methods Medication charts containing orders for parecoxib placed the month before the alert was implemented were compared against parecoxib orders placed during the same timeframe one year later. Concurrent NSAID orders were noted and the time between parecoxib and NSAID administration was assessed.

Results In the month prior to the alert implementation, 24 patients were prescribed parecoxib. Of these, 13 were also prescribed an NSAID. Six patients received a dose of ibuprofen, and one patient was dosed within 24 hours of parecoxib administration. One year later, 57 patients were prescribed parecoxib, 46 were prescribed an NSAID, 17 received a dose. The alert triggered for 18 patients (some multiple times), 10 received alternative analgesia (no NSAIDs given at all) and eight had doses of NSAID delayed until the 24-hour period had passed. Three patients administered NSAIDs within the 24-hour period did not trigger the alert because the parecoxib doses were not documented correctly.

Conclusion Parecoxib use at this hospital has increased significantly over the last 12 months, and the targeted alert has prevented a number of patients being inappropriately administered NSAIDs after parecoxib administration.

Aim To ensure consistent and uniform prescribing across a large local health district by using two electronic platforms to standardise ophthalmic guidelines.

Methods A list of appropriate ophthalmic indications, standard doses, and treatment durations was developed for all ophthalmic antimicrobials with the collaboration of the district AMS IT analyst, an eye hospital AMS pharmacist and ophthalmology fellow. Restriction classifications were established to assist with AMS compliance. The final list was discussed and approved by the governing Local District Committee.

Results For the district-wide electronic prescribing program, 60 ophthalmic antimicrobial indications and 190 order-sentences were developed to assist health practitioners prescribe appropriately. For the electronic AMS approval support system, 32 ophthalmic indications were created. New digital information has led to increased prescribing consistency and improved antimicrobial approvals. Locally, the creation of electronic tools resulted in a 17-fold increase of appropriate approvals between March 2017 and March 2018.

Conclusion The development of electronic ophthalmic antimicrobial guidelines illustrates the advantages of standardising digital support tools for prescribing across health districts. The district-wide system has improved prescribing practices, and enhanced the effectiveness of AMS in the specialised field of ophthalmology. The project shows opportunity exists for developing electronic guidelines across local health districts and potentially to expand to other medical specialties and state wide.

Background Ophthalmology treatment practices, traditionally directed by practitioner preference, are inconsistent between hospitals. The implementation of streamlined district electronic prescribing necessitates standardisation of antimicrobial ophthalmic guidelines to reduce treatment error, prescribing confusion and difficulty in Antimicrobial Stewardship (AMS) monitoring.

Aim Acute Behavioural Disturbance Management (ABDM) guidelines facilitate the safe and effective use of medication and de-escalation techniques to manage acutely disturbed patients on inpatient mental health units.

Our aim was to assess whether prescribing and administration practices of ABDM reflects the principles outlined in the ABDM guideline, and determine any changes in practice after the implementation of a state-wide electronic medication record (ieMR).

Methods A retrospective chart audit was conducted of patients admitted under a treatment authority, on a mixed gender ward. Three-time points were assessed, March 2017, prior to implementation of ieMR, and July and Oct 2017, after implementation. Prescribing and administration of “as required” medications during the first 48 hours of admission were examined in accordance to the ABDM guideline.

Results Prescribing in accordance to the guideline increased from 6.9% (March 2017) to 38.5%, and 25% respectively, post ieMR introduction. If the ABDM power plan (a pre-formulated set of orders that are grouped together) in ieMR was used, adherence increased to 46% (July 2017) and 50% (October 2017).

Adherence to administration guidelines occurred in 14%, 42% and 33% of patients respectively. When deviation did occur, there was limited documentation to indicate rationale for changes.

Conclusion Introduction of ieMR improved both prescribing and administration practices. Utilisation of the ABDM power plan by prescribers further increases adherence.
Variations from administration guidelines can be rationalised with the introduction and documentation of a rating scale for acute behavioural disturbance.

218 WHATSAPP WITH ANTIMICROBIAL STEWARDSHIP IN NSW?: EVALUATION OF SOCIAL MEDIA AS A RESOURCE

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Background Smartphone applications are communication tools commonly used in healthcare settings. Antimicrobial Stewardship (AMS) Pharmacists are often single practitioners with few opportunities for real-time information. A WhatsApp group was created to enable communication, networking and knowledge-sharing between AMS pharmacists across the state.

Aim To evaluate the experiences of AMS pharmacists using the social media application WhatsApp.

Methods A survey was sent out to 41 WhatsApp group participants using RedCap. The survey was open for 14 calendar days. Four non-member AMS pharmacists were identified and surveyed to gauge membership limitations.

Results The survey had a 100% response rate, representing 94% of districts. Most pharmacists had been working in AMS for 1-5 years, and 66% were also members of the SHPA ID-SPG (100% found the group brought additional utility to their practice).

All pharmacists agreed the group was useful, provided evidence-based answers and improved their clinical knowledge. Most (n=40/41) pharmacists agreed the group improved the AMS programme in their facilities and enhanced their AMS practice.

While 73% of pharmacists used the group daily, 43% believed it interrupted their work-life balance to some extent.

The most common utilities reported were being informed of drug shortages, keeping up-to-date with changes in practice, sharing resources and resolving clinical problems.

100% of non-member AMS pharmacists were unaware of the group and wished to join.

Conclusion WhatsApp is a valuable AMS resource, which may be useful in other clinical settings. Limitations to its use include awareness of the tool, and perceptions of social media.

219 A SELF-ASSESSMENT TOOL (SAT) FOR HOSPITALS THAT USE ELECTRONIC MEDICATION MANAGEMENT (EMM) SYSTEMS

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Aim To develop an SAT that enables Australian hospitals to assess their EMM systems and identify opportunities for optimisation as part of a continuous quality improvement process.

Background EMM systems are widely used in Australian hospitals. Consultation reveals that some hospitals are not realising the full benefits of EMM systems in improving medication safety and quality. There is a need to assess and optimise the safety and efficacy of these systems.

Methods The scope and initial development of the SAT was informed by consultation, an EMM roundtable and a literature review. The Leapfrog Group Survey and the UK NHS ePrescribing tool were considered as similar international initiatives. A reference group was established to provide governance and technical advice.

SAT domains and outcomes were tested in a small number of sites with a variety of EMM systems and implementations. An iterative process was used to incorporate user feedback and to refine the SAT.

The SAT will be released for use in hospitals in the near future. A stewardship program will be established to evolve the SAT in line with a maturing Australian EMM environment.

Results The SAT is a practical resource for hospitals in optimising the utility of their EMM systems. It provides the basis for national quality improvement of EMM systems.

Conclusion The SAT provides a platform for hospitals to interrogate EMM systems and the policies that support their use. Self-assessment provides a base for continuous quality improvement activities that optimise the safety and quality of the EMM system.

220 IT’S TIME TO RE-DESIGN SAFE PRESCRIBING EDUCATION FOR DIGITAL HOSPITALS!

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Aim To describe the implementation of a new safe prescribing curriculum for electronic medicines management (eMM) at a tertiary hospital.

Methods A think tank was assembled to explore the risk and medication errors related to the introduction of eMM found in the literature. The team of pharmacists, nurses, digital and educational experts developed a collaborative plan to deliver digital prescribing training to new prescribers. The new curriculum was delivered by a multidisciplinary team and evaluation
was incremental and decided the development of the next step.

**Results** There were four key findings from the literature review. Firstly, transitioning from paper to eMM can potentially reduce patient harm and improve effectiveness. Conversely, eMM has the potential to introduce new areas of risk/harm. Furthermore, many traditional safe prescribing practices are no longer relevant. Finally, hospitals using eMM are required to design a new curriculum on safe prescribing.

Following these findings, a new curriculum consisting of a series of didactic interprofessional teaching, experiential learning, peer-shadowing and learner-led workshops was developed. Key themes addressed in the new curriculum included alert fatigue, over-dependence on technology, selection error, communication pitfalls and transferring between hybrid systems.

95% of prescribers felt confident with safe prescribing practices at the conclusion of the program.

**Conclusion** Multidisciplinary input was essential in the development and delivery of this new curriculum. Medication safety themes in a Digital Hospital varied significantly from those traditionally found with paper-based systems. An incremental multidimensional teaching curriculum led to a high proportion of reported prescribing confidence.

221 **THERE’S AN APP FOR THAT: AUTOMATING ANTIMICROBIAL STEWARDSHIP REPORTS TO STRETCH LIMITED RESOURCES**

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**Background** The World Health Organisation-approved antimicrobial stewardship measure of defined daily dose (DDD) per 1000 patient days is used to report antimicrobial stewardship practices across the service. The process within this health service involved the use of 6 spreadsheets to calculate and produce graphs for all 42 facilities, taking up to 16 hours of pharmacist time to complete.

**Aim** To provide automated, meaningful and timely antimicrobial stewardship data to facilities within the health service via an online application.

**Methods** An electronic solution in the form of an online application was developed using QlikView, a business analytics tool. The application accessed both the database behind the dispensing software and the bed day database negating the need for a trained staff member to assemble information manually. This application was made available to all staff and implemented district-wide.

**Results** The new application achieved savings of clinician time and costs equating to approximately $13 000 annually for the district. Across the health service, there was a clear decrease in the DDD per 1000 bed day trend line seen for both 3rd generation cephalosporins and quinolones indicating evidence guided prescribing. Feedback from clinical staff was overwhelmingly positive with the majority of rural facilities using the application to report antimicrobial stewardship activities to their sector drug committees.

222 **EYES IN THE SKY: REMOTE PROACTIVE SURVEILLANCE SUPPORTING MULTI-SITE MEDICATION SAFETY DURING DIGITAL TRANSFORMATION**

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**Aim** To optimise the safe prescription and administration of high-risk medications via remote pharmacist surveillance of patient records during and immediately after the formal project go-live period of a full-stack integrated electronic medical record implementation.

**Methods** A pharmacist proactively reviewed patients ordered high-risk medications from 4 different hospital sites over 4 separate go-live periods as an independent safety check to digital project governance and in addition to standard clinical pharmacy services. Each site was monitored during and in the weeks immediately after their go-live period.

**Results** In total 2887 orders were reviewed for 729 patients. Of patients reviewed, 62% required intervention by the pharmacist, of which 83% were proactive in nature. Anticoagulants were the medication most commonly intervened on and 55% of total interventions were assessed as high risk. The mean time taken to complete the remote surveillance of high risk medication orders was 4.1 hours (range 0.25–12 hours). This approach provided real-time feedback and education to clinicians, analysis of trends to governance bodies and proactively prevent patient harm. System issues requiring escalation and state-wide
management were identified and resolved.

**Conclusion** A proactive approach to medication surveillance prevented patient harm and enabled expedition of system issues via the project rather than business as usual resulting in rapid resolution. Trend analysis enabled the development of fact sheets and targeted education. Initial onsite implementation at one hospital was expanded to successful off-site medication surveillance for subsequent electronic prescribing deployments by a pharmacist based at a remote hospital.

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**223 HOSPITAL WIDE COMMUNICATION AND ASSIGNING TASKS FOR PATIENT CARE – THERE’S AN APP FOR THAT!**

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**Aim** To trial an integrated care coordination platform for clinical and dispensary pharmacy services, using the Medtasker application.

**Methods** The Medtasker application was implemented on three wards for a 6-week trial. It was used for communication between clinical pharmacists and dispensary staff, and for tracking pharmacy tasks and auto-generated tasks. The work flow on the trial wards was evaluated against three control wards. The data were collated from the Medtasker application, and from standard pharmacist recording procedures.

**Results** Medtasker recorded a total 1750 tasks completed by three clinical pharmacists over a 6-week period, predominately drug chart review (471) and completion of the medication management plan (345), which are auto-generated tasks assigned to clinical pharmacists for all patients. Control wards recorded 220 drug chart reviews and 196 medication management plans completed. The benefits reported by pharmacists included robust communication between dispensary and ward pharmacists, less interruptions due to phone calls and the ability to self-assign tasks providing a reminder to complete (i.e. Therapeutic Drug Monitoring).

**Conclusion** The use of Medtasker provided an accurate reflection of tasks completed by pharmacy staff which is not being captured currently as tasks can be completed in real time. It provides managers with real-time data on workload. The work flow on trial and control wards were matched in complexity and work patterns.

Following the success of the pharmacy trial, the hospital has extended the use of Medtasker to pharmacy, medical and nursing staff as a communication tool and task-based platform.

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**224 EMM AND IV FLUIDS MANAGEMENT: ONCE RISKY ALWAYS RISKY**

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**Objective** Electronic medication management (EMM) is a rapidly growing medium of medication prescribing, administration and verification. Whilst solid dosage form medications are typically well handled by EMM solutions, fluids remain a point of complexity and concern for clinicians.

**Clinical Features** The software solution is in use by multiple facilities as part of a single shared domain, and was designed with continuous infusions the assumed workflow (American vendor). In Australia, during the early 2000s, a change to bag-by-bag ordering of fluids was precipitated by an ongoing theme of patient and medication safety issues related to fluids.

**Interventions and Outcomes** Two distinct designs are employed in the EMM to allow for fluid orders as bag-by-bag, and medication-containing infusion orders as continuous. The current strategies being investigated involve site, State and Safety pharmacists and groups, and are looking at a standardisation of how fluids are managed within the EMM, and the use of technology such as dashboards to remind clinicians of fluid review.

**Conclusion** Work in this area is ongoing and Australia-wide. Some facilities retain fluids on paper due to EMM idiosyncrasies, whilst using EMM for all other medications. The intervention undertaken some 15 years ago to utilise bag-by-bag fluids as a prompt to avoid fluid overload was made in a paper-dominant time; yet its safety considerations remain relevant today. Technical and cultural factors both need to be considered in any changes to EMM systems or processes.

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**225 TIME-AND-MOTION STUDY OF IMPREST SUPPLY TIMES BEFORE AND AFTER PYXIS IMPLEMENTATION IN FOUR EMERGENCY DEPARTMENTS**

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**Aim** To evaluate the impact of Automated Medication Distribution Systems (Pyxis MedstationTM) on the time spent on medication imprest supply to Emergency Departments (ED) at two tertiary and two secondary hospitals.

**Methods** Pharmacy technicians at each site recorded time taken for each task in the ED medication imprest supply process over a one-month period before Pyxis implementation and again three months after. The number of items supplied and any interruptions resulting in delays were also recorded.

**Results** At one secondary hospital, the weekly time spent on ED imprest supply was reduced by 1hr 20min (18%) after Pyxis. The proportion of time spent generating orders was reduced by 23% whilst the time spent unpacking orders increased by 16%. The times for all other tasks were also reduced. The days per week of imprest supply remained unchanged.
At one tertiary hospital, the weekly time spent on ED impest tasks was increased by 2hrs 6min (43%) after Pyxis. Whilst it took proportionally 33% less time to generate orders, the time for all other tasks increased. The likely explanation was that smaller impest orders done daily were needed, rather than larger orders three times weekly before Pyxis, due to storage capacity restrictions.

Post-implementation data will be collected for the remaining hospitals in August/September.

Conclusion Preliminary results showed different time and motion outcomes between a secondary and tertiary hospital post Pyxis implementation. Evaluation of two additional EDs will facilitate understanding on how the hospital type and drug distribution model can affect outcomes and benefits realisation.

226 WHERE'S WALL-E™: WHERE DO ROBOTS REALLY IMPACT HOSPITAL PHARMACY DISPENSARIES?
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Aim Identify areas of greatest impact on a tertiary hospital pharmacy dispensary after the introduction of a robot.

Methods A five-day time in motion study of a tertiary public hospital pharmacy dispensary, delivered in two phases:
1. Pre-implementation of robot
2. Post-implementation of robot

Data sources include: Dispensary video footage, Fit-Bit®, inventory management records, impest supply tracking databases, turn-around times, dispensing software data.

Results The time taken for staff to handpick impest stock increased by approximately 30 minutes per order in phase 2 and impest order requests ‘waiting to be actioned’ were delayed almost 3 hours more in phase 2.

However, workflow changes such as next day delivery, online ordering and improved use of the tracking system were introduced by phase 2. Pharmacy assistants/technicians saved only 30 steps a day in phase 2 where the robot was delivering medication to their workstation. The assistant managing impest supply had an increase of 10,000 steps per week in phase 2 (approx. 8km). Changes in workflow and repurposing of roles an can account for some of changes as over 30% more outpatient prescriptions were processed in phase 2 with little impact to inpatient supplies.

Conclusion Robotics combined with adapted workflows result in some efficiencies in medication supply. Pharmacy staff are able to process more work in the same amount of time, walking the same or greater distance as part of their adapted daily roles.

227 PHARMACIST INTERVENTION: WHERE ARE WE SPENDING OUR TIME?
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Aim To compare the number of pharmacist interventions being made pre and post-implementation of eMeds for Best-Possible-Medication-History (BPMH) and discharge (DC).

Methods A self-reported time-in-motion study of clinical activities was completed by pharmacists over a month period prior and post eMeds implementation. The post-implementation data were obtained one month after implementation.

Results Significant differences were noted between clinical areas. The lowest rates of intervention were found in BPMH conducted in ED(0.5) and sub-acute patients (1.0) whilst acute medical (2.6), surgical (1.9) and aged-care patients (1.4) had higher rates of intervention on BPMH.

After eMeds implementation the overall average of interventions increased to 2.4 per BPMH. Interestingly, surgical remained the same, whilst all medical specialities increased with ED and sub-acute patients increasing by more than double (1.2 and 2.3 respectively).

Prior to eMeds the overall average number of interventions made on DC was 1.1. This was lowest in surgical patients (0.7) and highest in aged-care and cardiology (1.6). The overall average increased slightly to 1.3. All clinical areas increased, with cardiology and aged-care increasing the most (3.6 and 2.1 respectively).

Discussion Whilst it was hypothesized that electronic prescribing would result in reduced errors on charting and hence less pharmacist intervention, this study demonstrates an increase in interventions post-implementation of eMeds. Factors that may influence results include prescribers and pharmacists with differing levels of experience/attention to detail. Evaluation of interventions should be repeated once prescribers have increased familiarity with eMeds.

Conclusion Regular assessment of how pharmacists are spending their time is essential to ensure an efficient and effective service.

228 OPIOID RELATED ADRS: DON'T START WITH WHY, START WITH Y45.0!
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Aim Retrospective review of electronic medical records (eMR) of surgical patients coded for ICD adverse drug reaction due to opioids (Y45.0) to identify any system or process issues.

Methods Team including a pharmacists and geriatricians reviewed data on patient demographics, opioids used,
reaction information and pain assessments.

**Results** We reviewed 45 perioperative patients administered an average morphine equivalent dose (aMED) of 101mg (SD=92.9). 51% were over 85 years of age (aMED = 91mg, SD = 70.4mg) while 31% (n=14) were in 75–85 years range (aMED = 132mg, SD = 137.7mg). Overall, central nervous system effects were most common (47%, n=21) followed by gastrointestinal effects (31%, n=14) with average aMED of 131mg (SD=116mg) in former and 82mg (SD=59.1mg) in latter. CNS effects were associated with longer average LOS (13 days) than GI effects (6 days).

Overall, 25 (64%) patients reported no-mild pain in the 24 hours prior to the event, while receiving aMED of 126mg (SD=111.9mg) during this period. 47% experienced CNS effects (aMED = 183mg, SD=131.4mg) and 40% had GI effects (aMED = 80mg, SD=71.8mg).

Only 12 (27%) of patients reported moderate-severe pain in the same period and 5 (36%) reported GI side effects (aMED=62mg, SD=39.9mg) while 3 (27%) reported CNS effects (aMED = 80mg, SD=63mg).

Type of surgery (Orthopaedics n=38, vascular n = 7) had no impact on incidence of adverse effects.

**Conclusion** Unwarranted clinical variation in opioid use was observed and a two pronged approach involving defining minimum standards and adopting a structured ADR documentation is under evaluation.

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**229 DIGITAL SURVEILLANCE TO IMPROVE CLOZAPINE MANAGEMENT IN NON-Psychiatric Wards**

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**Aim** To investigate whether digital surveillance of the Clinical Pharmacist Worklist (CPW) by an intern pharmacist can improve clozapine management in patients admitted to non-psychiatric wards.

**Methods** The CPW is an easily generated list using Cerner's integrated electronic medical record (ieMR). This was modified to include all current inpatients prescribed clozapine, excluding those admitted under psychiatric inpatient units. Newly admitted patients prescribed clozapine were identified. If they had not been reviewed, an intern pharmacist then contacted the ward pharmacist alerting them to the patient to ensure timely clinical review and supply of clozapine. Feedback was sought from these pharmacists regarding the utility of the service.

**Results** Over a three-month period 25 patients were identified through this worklist. Of these, 15 patients had not been reviewed by the ward pharmacist at the time of intern review of CPW. Upon investigation 3 patients required hospitalised re-titration of clozapine, and the intern pharmacist review helped to expedite this. Four patients had an unintentional mismatch between the clozapine dose prescribed and the dose documented in the pharmacists’ admission history.

**Conclusion** Patients admitted to hospital who are prescribed clozapine are at high risk of medication misadventure. Administration of clozapine to patients who have been non-adherent may lead to seizures and severe hypotension. Extended omission of doses is also problematic as it requires prolonged re-titration and may lead to relapse. Timely pharmacist review of inpatients’ clozapine is thus essential. This simple functionality enables the early identification of patients prescribed clozapine in a non-psychiatric setting.

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**230 NEW STATE-WIDE ELEARNING MODULES TO IMPROVE DOCTORS’ KNOWLEDGE OF VENOUS THROMBOEMBOLISM PREVENTION**

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**Aim** To develop eLearning modules aimed at training doctors on how to assess and manage venous thromboembolism (VTE) risk using a state-wide electronic VTE risk assessment tool.

**Methods** The modules’ development was prompted by consideration of advantages and disadvantages of online learning over existing educational methods (class-based teaching using a PowerPoint presentation developed by a state-wide multidisciplinary VTE expert advisory group); and feedback from hospitals requesting interactive, flexible and on-demand resources to support training. A working party consisting of subject matter experts and instructional designers was formed to oversee the modules’ development. Content from existing educational material was adapted to establish key messages relevant to junior doctors and included in the modules. Following a consultation process to obtain feedback from expert advisory group members and end users, the final modules became available on the state-wide eLearning system.

**Results** Two interactive modules were developed; the first module teaches users how to use the electronic VTE risk assessment tool, and highlights important clinical considerations when assessing and managing VTE risk. The second module consists of a scenario-based practice activity which tests the user’s ability to assess and manage VTE risk using the electronic VTE risk assessment tool. Ongoing evaluation will involve monitoring module completion, and impact on VTE risk assessment completion and appropriate prophylaxis prescribing.
Conclusion New state-wide eLearning modules focused on VTE prevention have been developed. These will assist with supporting training requirements for the implementation of the state-wide electronic VTE risk assessment tool and improve doctors' knowledge of VTE prevention.

231 EMPOWERING PATIENTS TO MANAGE MEDICATIONS: INCORPORATING MEDICATION MANAGEMENT STRATEGIES INTO AN E-LEARNING MODULE

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Aim To describe the development of an interactive e-learning module containing information on managing complicated medication regimens in addition to medicine specific information for patients undergoing a renal transplant.

Methods An expert group, including pharmacists, nephrologists and nurses was formed to create and review content for the module. Existing patient orientated medication websites were reviewed to identify any medication management resources that could potentially be incorporated. An external vendor was engaged to design the module. During development the module design and content were reviewed by renal transplant patients.

Results A combination of text, audio, diagrams, pictures and animations were used to deliver the medication specific information. Questions and activities such as selecting tacrolimus capsule strengths to make up a dose were incorporated throughout these chapters to check the patient's understanding of key messages. In addition, two chapters were devoted to assisting patients with managing their medications post-transplant including the use of medication apps, establishing routines, setting alarms, storing, handling and travelling with medications. A video outlining the benefits of using a dose administration aid and demonstrating a systematic approach to filling the aid was created and incorporated. To emphasise the importance of taking medications post-transplant, statistics highlighting the increased risk of graft failure with medication non-adherence were included. Patient feedback throughout the development of the module was positive.

Conclusion The development of an interactive e-learning module for patients post renal transplant provided an ideal platform to incorporate information on medication management in addition to medicine specific information.

232 EVALUATION OF EDUCATION TOOLS FOR A NEW ELECTRONIC DRUGS OF DEPENDENCE MANAGEMENT SYSTEM

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Background Our major tertiary teaching hospital developed and progressively launched Australia's first electronic Drugs of Dependence management system called Enkey. Such an undertaking requires comprehensive education of thousands of staff with little dedicated resourcing.

Aim To improve Enkey education systems by interviews of front-line staff during its early implementation.

Methods Interviews and surveys were conducted with 15 nurses on the Enkey pilot ward. The responses to the closed and open-ended questions regarding the transition from paper drugs of dependence registers to the electronic system was analysed to identify areas requiring further development or increased education focus.

Results 100% of nurses interviewed were neutral or preferred using Enkey in comparison to the handwritten registers. No nurses preferred handwritten registers, however, no nurses rated Enkey as a perfect system.

Efficiency, legibility and increased diligence in the maintenance of drugs of dependence were the three most commonly reported positive attributes of Enkey.

Recording and documenting liquid forms of medication, errors in balance checks and the system requiring the use of the computers' mouse were the most common complaints.

47% of nurses found measuring liquids difficult to document in Enkey and 13% of nurses found documenting the destruction of drugs difficult.

Conclusion Interviewing nurses on the use of Enkey highlighted areas where improvements are required. The responses from the nurses suggest developing informational tools will assist in completion of complex transactions.

233 IMPROVING CHEMOTHERAPY QUALITY AND SAFETY – VICTAG CHEMOTHERAPY AUDIT TOOLKIT

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Background/Aim In response to significant quality incidents in New South Wales with off-protocol carboplatin and in South Australia with underdosing of cytarabine, a survey of health services providing chemotherapy in the state was undertaken. It was identified that retrospective auditing of chemotherapy prescribing was reported by only 27% of health services. To address this gap, a project was launched to develop a Chemotherapy Audit Toolkit, that would include an overarching quality framework and an audit tool.

Methods Extensive consultation was held with the healthcare sector to understand current auditing practices and the distribution of Electronic Prescribing Systems. The first phase focused on providing an audit tool for the four electronic systems currently in use in public hospitals in Victoria:
CHARM, ARIA, Epic and Cerner, with a pilot being completed at CHARM sites.

**Results** The audit tool has currently been tested with hospitals using CHARM, three in Victoria, one in Queensland and a national private provider. Feedback from these test sites, has found that the audit tool is relatively easy to use, has a small time burden and is able to be integrated with existing oncology department structures. Avenues for use with Epic, ARIA and Cerner are currently being tested. The next phase will focus on developing an audit method that will provide maximal impact for paper-based systems.

**Conclusion** Pilot testing has demonstrated that the Chemotherapy Audit Toolkit can be further tested and developed to provide a best practice quality framework and a supporting audit tool for chemotherapy prescribing.

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**Background** Electronic medication management (EMM) systems include multiple alert categories to warn prescribers of potential medication errors. Information is lacking on which alert category or categories to include in an EMM system to maximise the potential safety benefits, balanced against the risk of excessive alerts and alert fatigue.

**Aim** To synthesise evidence of the effectiveness of interruptive medication prescribing alerts and to report the process by which Australian hospitals make decisions about which alerts to include in an EMM system.

**Methods** Part 1: a systematic review to critically appraise the literature on the effectiveness of hospital interruptive medication prescribing alerts. Part 2: a standardised, semi-structured telephone survey with a purposive sample of key stakeholders involved in EMM implementation in Australian hospitals (n=26).

**Results** In 53% of the 23 studies reviewed, alerts improved prescriber behaviour. There was no evidence to indicate that one alert category was more effective than another, and no studies examined the cumulative effects of multiple alerts.

The survey revealed Australian hospitals are highly consistent in the alert categories implemented (drug-allergy alerts 100%, drug-drug interaction alerts 100% and dose range alerts 69%). Implementers believe that there is published evidence which supports their use and effectiveness. Few hospitals had assessed alert effectiveness, and implementers reported doubts about the likely effectiveness of their alerts locally.

**Conclusion** There remains a paucity of evidence to inform the selection of interruptive medication prescribing alerts in hospital EMM systems. The Australian experience offers lessons learned on designing and implementing effective interruptive prescribing alerts.

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**Background** Electronic medication management (EMM) systems include multiple alert categories to warn prescribers of potential medication errors. Information is lacking on which alert category or categories to include in an EMM system to maximise the potential safety benefits, balanced against the risk of excessive alerts and alert fatigue.

**Aim** To describe strategies in place to maintain the accuracy and integrity of the drug dataset for SIPs.

**Methods** There is compelling evidence to support implementation of SIPs with Dose Error Reduction Software (DERS). Whilst resources are made available for implementation, sufficient consideration may not be given to ongoing dataset maintenance and sustaining optimal user compliance with the safety software. A multi-pronged approach was taken at a tertiary referral hospital to address these post-implementation considerations.

**Results** The eMedicines Management (eMM) pharmacist regularly updates datasets after multidisciplinary collaboration, consensus and independent check from a second eMM pharmacist. The subsequent dataset change report is tabled at Drug & Therapeutics Committee (DTC). Since implementation in 2012, a dataset update has been released via wireless technology 79 times (~1 update/month). As testament to its quality and utility, the dataset has been requested by and shared with 26 hospitals.

Locally generated and vendor-provided CQI reports facilitate identification of top alerting drugs, “good catches” and holes in on perceived vs. actual practice. Biannual compliance audits consisting of physical inspection of pumps are performed by nursing and pharmacy representatives, further providing opportunity for engagement with frontline staff. These regular audits have contributed to sustained compliance (95%) with DERS. CQI and compliance reports are presented to Hospital Executives, DTC and Medical/Nursing Forums to demonstrate safety improvements and identify further areas for review/education.

**Conclusion** These strategies have resulted in improved medication safety, pump usability and potential cost savings of $2.7million, reiterating SIPs are far from “set and forget” initiatives.
Aim To investigate the effect of enhanced electronic medical records (eMR2) and electronic medication charting (eMEDS) on the prevalence of height and/or weight (HAOW) documentation, and its impact on the quality use of medicines.

Methods Medical records of 50 patients at each stage, respectively, before eMR2 implementation, after eMR2 implementation, and after eMEDS implementation – were analysed for HAOW documentation. Active oral and injectable prescriptions were analysed according to AMH recommendations to determine if HAOW were necessary for direct or renal dose adjustment.

Results

1. Weight recording across the three stages increased by 3.75-fold, from 24% to 44% to 90% of patients.
2. Height recording increased by 6.2-fold from 10% to 38% to 62% of patients.
3. Patients with both height and weight recording increased by 5.8-fold from 10% to 38% to 58%.
4. Of the 150 patients analysed, 100% required HAOW to optimally dose between 25–100% of prescriptions. Patients had a mean of 6 medicines requiring HAOW.
5. Of 170 different medicines analysed, 60% required HAOW to ensure accurate dosing. 55% required height and weight to accurately renally adjust dose, 10% required direct weight-based dosing and 11% required both direct weight-based and renal dose adjustment.

Conclusion While all inpatients are likely to require HAOW to safely prescribe medicines, a majority had neither height nor weight recorded in their medical records before or after eMR2. eMEDS significantly increased the recording of these variables. Patient-specific limitations may contribute to incomplete records, despite electronic prompts in eMEDS to undertake HAOW recording.

Conclusion The automatic reporting functionality from eMMS to determine prescribing information and target HRMs was inaccurate.

A real time snapshot audit using eMMS was conducted over five days. The reporting functionality designed by the vendor was used to generate daily reports at a designated time point to identify patients prescribed High Risk Medicines (HRMs). The HRMs were; vancomycin, opioids and oral anticoagulants. A random 20% sample were audited. Three pharmacists reviewed the active eMMS chart at the same designated time point to manually collect data. The total number of medicines and number of HRMs per patient were compared between the generated eMMS report and the manual data collection.

Results 933 patients were prescribed at least one HRM during the audit, 21% (202) were analysed. The average number of medicines prescribed per chart was 13 (Range 1–25, median 12). There was a discrepancy of HRMs stated in the eMMS report in 39% (79/202). The most common error was false positive HRMs on the eMMS report which were not prescribed on the patients active chart (n=60).

Conclusion The automatic reporting functionality from eMMS to determine prescribing information and target HRMs was inaccurate.

USE OF DYNAMIC WARD LISTS TO ASSIST PRIORITISATION OF PHARMACIST SERVICES

A prospective audit was conducted over five days in a tertiary hospital, which utilises an electronic medicines management system (eMMS). Reports generated by the hospital eMMS, pathology and patient flow databases were combined daily using a bespoke program written with visual basic and java. The program applied 245 clinical rules over the three datasets to produce ward lists with clinical suggestions for pharmacists. The clinical rules included; identification of patients with medication doses not matching their estimated glomerular filtration rate (eGFR), drug interactions, doses not matching patient age or the prescribed indication, regularly dosed opioids with no aperient charted, high cholinergic load vs age or a highly protein bound medication charted vs low serum albumin.

Results The system reviewed 2101 patient charts from 808 patients admitted over the audit period. Of these, 133 patients (16.5%) had one or more suggestions generated. Of these, the
most common were for an incorrect dose versus indication (i.e. ceftriaxone 2g daily for appendicitis) 22% (30), drug interaction 16% (21) or a patient prescribed 3 or more nephrotoxins 15% (20).

Of the 245 clinical rules, 214 were never triggered. These included uncommon drug interactions, or rare scenarios such as “any neonate prescribed antibiotics for >3 days without antifungal prophylaxis”.

Conclusion The use of clinical rules fired over health datasets can help identify patients in need of pharmacist intervention.

Methods As part of a hospital-wide eMM implementation, iterative design and validation of several analytics dashboards was conducted by business analysts and pharmacists between October 2017 and April 2018, leveraging the QlikSense® platform. In parallel, a ‘data lake’ was established to regularly extract data from Cerner Millennium® databases for near real-time reporting. Following implementation, dashboard utilisation was audited from April to June 2018 using access metrics.

Results A suite of six analytics dashboards was implemented in April 2018 as part of the Children's Health Intelligence Reporting Portals (CHIRPs), providing real-time analysis of data from the eMM system. Specifically, dashboards captured details of medication and infusion orders placed, audited compliance with barcoded positive patient identification, identified orders requiring therapeutic drug monitoring and quantified various pharmacy clinical documentation. These dashboards were among the most frequently utilised within CHIRPs, with 284, 226 and 121 sessions of the medication orders, pharmacy clinical documentation and barcode scanning compliance dashboards being launched, respectively, between April and June 2018. The medication orders dashboard was used by the hospital's pharmacy department to facilitate efficient control of five inventory management issues, including shortages of piperacillin-tazobactam and metronidazole.

Conclusion Implementing eMM presents unique opportunities to embrace real-time business intelligence, using analytics dashboards to capture medicines management activity data and transform it into meaningful information that is frequently utilised to assist and inform clinical operations, hospital governance and accreditation.

Aim To design and implement real-time analytics dashboards using electronic medication management (eMM) data and evaluate their utilisation at a paediatric hospital.

Methods A trial webpage was created using URL-based queries, smart search functionality was added, allowing the user to open multiple reference windows directly when entering a single search term. Timestamp data were collected from page loads, links clicked and search terms used. Additionally, search times were recorded before and after the intervention to establish time saved per pharmacist.

Results Over 2.5 months, 2200 searches were conducted, with 10–15 users loading the page on a daily basis. Medical reference search times decreased from 55 seconds to 8 seconds and interaction searches decreased from 63 seconds down to 11 seconds per search. With current usage, this translates to 10–15 hours saved/pharmacist/year.

Conclusion In conclusion, it's time for everyone to search smarter and faster. Smart search functionality has been shown to reduce reference search time for users. This simple web page can be easily adapted to other sites. As more resources utilise URL-based queries, the promise to save time increases. By consolidating all regularly accessed resources into one page, clinicians can concentrate on other patient oriented activities.

Aim To increase awareness of our clinical workforce to medication safety risks and trends and engage multidisciplinary quality improvement to maximise patient safety.

Methods A medication safety dashboard was designed and implemented using Riskman clinical incident data and the Qlikview platform in collaboration with our Patient Safety & Quality unit.
**Results** The Qlikview medication safety dashboard is in use across the health service providing clinical staff with quantitative and qualitative analysis of medication related clinical incidents using a slicing function. This allows on screen visibility of data categorised by location (e.g. hospital/service group/ward); high risk vs non-high risk drugs; drug class (e.g. narcotics, anticoagulants); severity assessment category and process (e.g. administration, prescribing).

Using the dashboard, medication related clinical incidents are now easily reviewed into themes and trends for discussion and quality improvement at local medication safety working groups, morbidity and mortality meetings and ward meetings.

Links to monthly reporting and action plan templates feature on the home page to facilitate documentation, communication and quality improvement action planning.

**Conclusion** Implementation of the Qlikview Medication Safety Dashboard has provided a user friendly, visual tool for the clinical workforce to increase awareness of medication safety risks and trends and associated quality improvement. The success of the medication safety dashboard model has driven the development of similar dashboards for other categories of Riskman clinical incident data in our health service.

242 A SPOONFUL OF EMEDS HELPS THE MEDICINE GO DOWN: EMEDS/WORKFLOW SYNERGY IMPROVES DISCHARGE SUMMARY ACCURACY

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**Background** Unintentional medication discrepancies in discharge summaries (DSs) are common causes of avoidable harm, contributing to patient relapse and hospital readmission. Electronic medication management (eMEDs) presents an opportunity to reduce the risk of harm.

**Aim** To increase completion of discharge medication reconciliation in the eMEDs environment and improve consistency of medication lists in DSs.

**Methods** A 5-day retrospective baseline audit was undertaken at a 570-bed district hospital (September 2017), 7 months post-eMEDs go-live. A structured audit tool was used to assess the consistency of medication lists in DSs with discharge medications prescribed and dispensed. A focus group comprising the eMEDs team, pharmacists, and medical officers discussed baseline findings and solutions. Following consensus on the standardised discharge process, a multi-strategy approach was applied: a redesigned eMEDs training package for medical officers/pharmacists, mandatory use of eMEDs discharge reconciliation functionality and requirement of ‘in progress’ DSs with complete lists of imported and reconciled medications prior to supply from pharmacy. A post-intervention audit was conducted (March 2018).

**Results** At baseline 48/171 (28%) patients received DSs which did not accurately reflect the discharge medications supplied to them. A post-intervention repeat audit found a reduction of discrepancies to 4/211 (1.4%) (p<0.01). At baseline 98/680 (14.4%) discharge medications supplied did not match the documented medication lists in final DSs. The main discrepancy was omission. In the repeat audit, 4/573 (0.7%) medications supplied did not match (p<0.01).

**Conclusion** These findings highlight the importance of collaborative, multidisciplinary adoption and integration of the eMEDs system into clinical workflow to achieve its benefits at discharge.
EASY-TO-USE SYSTEM

IMPLEMENTATION OF A DISTRICT-WIDE

DRUGS MANAGEMENT: LEADING THE

AIM TO SIMPLIFY HAZARDOUS

DRUGS MANAGEMENT: LEADING THE

IMPLEMENTATION OF A DISTRICT-WIDE

EASY-TO-USE SYSTEM

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Aim To develop and implement an easy-to-use identification and management system for handling hazardous drugs within a Local Health District (LHD) to improve staff safety.

Methods A Pharmacy-led LHD-wide working party created an Australian-centric, alphabetical categorised hazardous drugs list for use within the LHD. This involved the use of Australian and international hazardous drugs lists and extensive consultation with Nursing, Medical and LHD Executive staff.

Identified drugs were allocated one of three risk categories: Cytotoxic; Hazardous – Universal Risk; or Hazardous – Reproductive Risk. A corresponding table was created addressing handling requirements of different drug forms (e.g., PPE, administration/preparation authority) and management (e.g., bodily waste, linen) according to risk category.

These resources were made available to staff via LHD intranet and pharmacists conducted extensive education to explain their utility.

Results Creation of these resources has provided clear, consistent guidelines for staff on management of these drugs. Preliminary survey results indicate staff feel more confident in their ability to distinguish between different hazardous drugs categories and in directing themselves and other staff how to handle and manage hazardous drugs when referring to the developed resources. Making such resources universally available has also limited pressure on Pharmacy staff to provide repeated individual advice.

Conclusion Initiative and leadership by a Pharmacy-led working party to implement an easy-to-use identification and management system for handling hazardous drugs resulted in the development of a number of key resources that have started to improve staff understanding of safe practices required to handle hazardous drugs within the LHD.

244 CAN A LOCAL AUDIT TOOL IMPROVE MEDICAL, NURSING AND PHARMACY DOCUMENTATION FOR DAY CHEMOTHERAPY PATIENTS?

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Aim To develop a pragmatic, paper-based audit tool for chemotherapy prescribing, dispensing and administration across day chemotherapy centres in a specialist women’s hospital and general teaching hospital.

Methods Pharmacy purchasing and dispensing records were used to identify cytotoxic drugs administered to patients in day chemotherapy. A sample of patients was identified for audit on a monthly basis.

One pharmacist not involved in the dispensing of chemotherapy conducted an audit of patient prescriptions and medical records.

Results were fed back to a multidisciplinary group of pharmacists, nurses and medical oncologists.

Results After two months, patients on azacitidine, bevacizumab and carboplatin were identified. Pragmatically a maximum of five patients were randomly chosen for audit at each site each month.

• After audit, medical records for the patient on azacitidine were lacking in oncologist review documentation. After discussion with oncologist and health information services, an improved process was identified to source and file off-site medical review notes.
• Pharmacist prescription records in the first month were found to be lacking documentation that blood tests, dose and frequency had been confirmed (although all patients were safely managed as chemotherapy dosing was consistent with EVIQ protocols with normal blood tests). After feedback to pharmacists, compliance with documentation improved to 100% in the second month.
• All nursing documentation was found to be consistent with hospital protocols.

Conclusion Although early stages, a local, paper-based audit tool has been piloted for 2 months and has resulted in system improvements in management of documentation for patients requiring chemotherapy.

245 TIME TO INCREASE STAFF FLEXIBILITY THROUGH STANDARDISED ROLE DESCRIPTIONS

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Aim To develop, consult and implement standardised RDs across 14 public hospital pharmacies.

Background Our organisations most valuable asset is its staff, currently 614. A 5-year Roadmap was established outlining the strategic direction for workforce planning serving to meet the identified needs and priorities of staff promoting a flourishing and contemporary workforce. An initial Roadmap project was to standardise RDs. Historically, individual sites evolved RDs yielding over 140 across the prevalent staff classifications.

Methods In 2013, we used existing RDs to draft a small suite of generic RDs. These were independently classified ensuring correct alignment with industrial work level definitions. These RDs were implemented for new contracts, in performance development discussions and in service changes. Over time the suite was expanded to include more classifications. In 2017, in response to a staff survey identifying a desire for
flexibility to move within the organisation and access to promotional opportunities a consultation process was commenced with staff and unions to transition all staff to the generic RDs.

Results Feedback was received indicating unique requirements for three roles. We have progressed to implement the RDs for all but these three staff where further consultation is required. The number of RDs in use has reduced from over 140 to 19 covering 90% of the workforce.

Conclusion Standardised RDs have been developed and implemented for a majority of Pharmacy positions optimising classification ease, identifying appropriate roles and responsibilities, supporting staff flexibility to move between sites and supporting career progression through clarity in higher level roles.

246 IT’S TIME TO REVIEW WHATSAPP™
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Aim Investigate the effectiveness of WhatsApp™ group messaging on workflow within the Pharmacy of a tertiary hospital and assess attitudes of pharmacy staff post-implementation.

Methods
1. Anonymous, voluntary survey investigating pharmacists’ attitudes
2. Retrospective time-series audit of 8 months pre- and post-implementation of WhatsApp™ reviewing key performance indicators of clinical activity
3. Review of message-type and specialty for a sample month of March 2018

Results Thirty individuals completed surveys, of which 24 were current users of WhatsApp™. 96% of users agreed that it was superior to traditional paging; 79% used it 2 to 3 times a week or more; 87.5% were aware of local guidelines regarding its use; and 37% expressed concerns regarding patient confidentiality.

Staff who do not use WhatsApp™ (n=5) reported feeling that they receive less support.

Sample month: 190 messages, 107 (56%) related to requests/offers for help.
Frequency of requests per clinical area (counted once per day to correct for multiple messages related to one request) indicated that the Assessment and Planning Unit (APU) was associated with the majority of requests for assistance (37%), more than double the next most frequent area.

Post-implementation there was an 18.7% increase in total counselling-sheets produced by clinical pharmacists and in APU a 9.9% increase in admission medication reconciliations completed within 24hours. No other improvements were noted.

Conclusion WhatsApp™ has been positively received. Although we cannot prove a causal effect on the increase in the number of counselling sheets and admission medication reconciliations in APU post-implementation of WhatsApp™, a relationship seems apparent.

247 MONITORING CHEMOTHERAPY PRESCRIBING COMPLIANCE IN THE POST INQUIRY ERA
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Aim The purpose of the Committee is to ensure safe, appropriate and cost effective use of chemotherapy, by reviewing and evaluating protocols that are not in the NSW Cancer Institute (eviQ) database, but are requested for use by our clinicians. It also monitors dose modification trends within eviQ protocols, prospectively and retrospectively, as well as additions and omissions to protocols. A new chemotherapy audit tool has been developed by the Haematology and Oncology Compliance Pharmacist to monitor chemotherapy prescribing compliance with eviQ protocols.

Methods HOPRC members were appointed in 2016. A chemotherapy audit was performed in March 2018 to examine the compliance rates to standard cancer protocols at our Hospital post implementation of HOPRC.

Results A total of 100 patients were included in the audit. Results found that none of the 100 cases were assessed to have treatment outside expected and reasonable norms without valid rationale having been provided.

Conclusion The establishment of the HOPRC review process along with the introduction of the role of the Haematology and Oncology Compliance Pharmacist position has led to a significant improvement in the clinical governance process within the cancer services at our institution.
The leadership showed by pharmacy ensures patients are appropriately assessed and prescribed VTE prophylaxis based on their level of risk. The multidisciplinary top-down, bottom-up approach to quality improvement shows strong governance of VTE risk assessment in compliance with NSW Health policy. Although stated aims are not yet met, further interventions including education, feedback and integration into electronic systems will ensure sustainable change.

249 LET IT GO! ASSESSING PHARMACIST INTERVENTIONS DURING RECONCILIATION OF GENERAL AND SPECIALITY MEDICINE DISCHARGE PRESCRIPTIONS

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Background/Aim Our 2016 data demonstrated nurse-administered assessment of surgical discharge prescriptions using developed defined criteria enabled reallocation of 14 hours/week of clinical pharmacist time.

This study assessed the rate and severity rating of clinical pharmacist interventions when reconciling General and Specialty Medicine discharge prescriptions for the purpose of understanding potential risk of implementing a similar nurse-administered assessment for such discharges.

Methods All pharmacist reconciliation of General and Specialty Medicine discharge prescriptions during a 5-day period were included. Pharmacists assessed each prescription as 'high or low needs' using our developed Pharmacy High Needs Criteria and recorded all interventions. Interventions were classified according to type (e.g. wrong medication, wrong dose, drug interaction) and potential risk severity on a scale of 1–5 (1&2=minor, 3–5=major) using modified Department of Health assessment tools.

Interventions were independently reviewed and discrepancies from the intervention classification/rating and clinical documentation on the prescription were referred to a blinded pharmacist for independent assessment. Discussion with the original pharmacist for final consensus was undertaken if the discrepancy remained.

Results 210 patients were included in this study (60% General Medicine; 40% Specialty Medicine) of which 87% were 'high-needs'. A total of 250 interventions were recorded, 93% (n=232) in 'high-needs' and 7% (n=18) in 'low-needs' prescriptions. 19 ‘Major risk’ interventions occurred, all in ‘high-needs’ prescriptions.

Conclusion 93% of interventions occurred in ‘high-needs’ prescriptions. All interventions for ‘low-needs’ group were classified as ‘minor’ risk. This study demonstrates pharmacist reconciliation of ‘low-needs’ General and Specialty Medicine discharges is of low value and could be safely “Let go”!

250 IT’S TIME TO ADVANCE TECHNICIAN ROLES AND SAVE ON MEDICATION WASTAGE

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Aim To compare wastage audits before and after pharmacy assistant and pharmacist-led nurse education and to gather evidence for an advanced scope pharmacy assistant ward role.

Methods Over a 2-week period in February 2016 and 2018, all medication returned to pharmacy from the wards in a large metropolitan hospital was audited to identify unnecessary wastage. Pharmacy assistant and pharmacist-led education sessions on medication wastage took place across the hospital to 250 nursing staff during 2017. Findings from the 2018 audit were used to calculate cost savings. All costs were adjusted for inflation.

Results The audits showed that compared to February 2016, medication wastage had reduced in 2018. It was calculated that the cost of medication wastage was reduced by $1,715.67 in the fortnight, extrapolating to an annual
Leadership

saving of $44,607.45. The 2018 audit also identified wards within the hospital with the highest medication wastage cost, thus providing evidence for targeted re-education.

The audits provided the evidence required to have a pilot advanced scope pharmacy assistant ward role approved. The role was designed to help reduce wastage on the geriatric ward, and was jointly funded by the geriatric unit and the pharmacy department.

Conclusion Pharmacy assistant and pharmacist-led education sessions on medication storage reduced wastage and saved the hospital money. The audit also highlighted the importance of pharmacy assistants and provided evidence to create an advanced scope pharmacy assistant ward role to help reduce wastage.

Aim To illustrate outcomes of a pharmacy department TBR model.

Methods Review of in-house research database to identify TBR and related output.

Results This model has produced a number of bodies of work in areas including: emergency medicine pharmacy, electronic medicines management, transplantation, Aboriginal health, extracorporeal membranous oxygenation, QUM, diabetes, medication safety, oncology and pharmacy departmental services.

Several themes e.g. anaphylaxis, have developed over many years. Each have informed our knowledge, standardized our approach when measured against evidence, as well as provided a rationale to continue or change our path. Many have resulted in conference presentations and publication.

Projects involved a range of levels of expertise and developed junior staff. They have built research relationships between pharmacy, other departments, universities and within pharmacy, working towards a joint goal.

Conclusion TBR has been implemented in the pharmacy department and produced a body of work in a number of targeted areas. This model could be implemented at other sites to promote a collaborative pharmacy departmental research culture.
Aim To report pharmacy technicians’ attitudes about the effectiveness of safety measures implemented over a five-year period in order to reduce risk of repetitive strain injuries (RSI) associated with sterile compounding and aseptic manipulation at a large metropolitan public hospital.

Methods Following a sudden volume increase in compounded sterile preparations in 2013, three pharmacy technicians at the study hospital suffered hand-related RSI. The risk control strategies implemented between 2013 and 2018 were categorised into five domains of ‘equipment and consumables’, ‘training and assessment’, ‘lean waste reduction’, ‘roster and shift limits’ and ‘workload allocation score’. This study collected pharmacy technicians’ feedback through an anonymous survey. Responders rated their perceived effectiveness of each domain of strategies using a five point Likert Scale. Technicians who have been regularly undertaking aseptic compounding activities over the last two years were included in the audit. Technicians consented by participation.

Results Five pharmacy technicians were surveyed. The five domains of ‘equipment and consumables’, ‘training and assessment’, ‘lean waste reduction’, ‘roster and shift limits’ and ‘workload allocation score’ were rated effective or very effective by 100%, 100%, 100%, 80% and 80% of the technicians, respectively. Overall effectiveness of all strategies combined was rated effective or very effective by 100% of the participants.

Conclusion A range of risk reduction initiatives were implemented over a five-year period to reduce the risk of RSI associated with sterile compounding. Pharmacy technicians’ anonymous feedback has revealed the majority find these strategies effective or very effective.
Workforce / practitioner development

254 IMPACT OF THE ADDITION OF A PHARMACY ASSISTANT TO THE STROKE CLINICAL PHARMACY SERVICES

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Aim To assess the impact of a clinical pharmacy assistant on the Australian Pharmaceutical Advisory Council (APAC) key performance indicators (KPI's) on a Stroke Unit.

Background The role of pharmacy assistants within hospitals is evolving. A clinical pharmacy assistant position was introduced to the Stroke / Neurology unit in 2014 at a 0.5 Full Time Equivalents (FTE) capacity. The role included the documentation of patient medication histories.

Methods A retrospective review of available medical records was performed to determine the degree of compliance with APAC KPI's pre- and post-implementation of a clinical pharmacy assistant on the Stroke unit.

Results A total of 63 medical records were reviewed: 30 from the pre-assistant period (2013) and 32 from the post-assistant implementation period (2016). Post-implementation, 34% (11/32) of medication histories were completed by the pharmacy assistant. The percentage of patients who had a medication history documented during their inpatient stay increased from 80% (24/30) pre-implementation to 100% (32/32) post-implementation (P=0.0097). Pre-implementation, 67% of patients (20/30) had a medication history documented during the first 48 hours of their inpatient stay, compared with 94% (30/32) post-implementation (P=0.0096). The percentage of discharge prescriptions checked by a pharmacist increased from 35% (6/17) pre-implementation to 90% (9/10) post-implementation (P=0.014).

Conclusion The addition of a Stroke / Neurology Pharmacy Assistant role at 0.5 FTE resulted in increased compliance with the APAC KPI's. Empowering pharmacy assistants with additional skill sets enables them to work in clinical roles. This results in extended pharmacy patient coverage and improved pharmacist workflow.

255 STANDARDIZING THE PRESCRIBING, DISPENSING AND LABELING OF ETOPOSIDE PHOSPHATE TO AVOID DOSING ERRORS

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Aim Promote an understanding of etoposide phosphate calculations in order to avoid dosing errors.

Methods Etoposide phosphate is the water soluble salt form of etoposide. Etoposide phosphate 1.136mg is equivalent to 1mg of etoposide base. A flow chart explaining the dosage rules and associated etoposide doses was used in informal training sessions with pharmacists from 23 oncology clinics around NSW and ACT.

Results Of the 23 clinics:

• 56% were already ordering the etoposide as base dose 100mg/m2 dosing rule (i.e. no change)
• 17% decided not to use the phosphate form to avoid confusion
• 17% (one entire local health district) changed their protocols and dosage rules to the base (100mg/m2) from the phosphate (113.6mg/m2)
• 13% remain ordering as the phosphate using 113.6mg/m2

The training sessions highlighted pharmacist confusion over the different etoposide formulations when prescribing, ordering and dispensing. Even after visiting one particular clinic, an error detected in an order placed for the following day.

Conclusion Since 2010 it has been recommended that etoposide phosphate formulation is prescribed, dispensed and labelled as the equivalent etoposide base to minimise risk of dosage errors. This recommendation is included in the COSA Cancer Guidelines Wiki. Despite this, there is still inconsistency in the prescribing and ordering of the etoposide phosphate formulation by some NSW and ACT clinics. With direct training, these practices were improved. This demonstrates that ongoing training and education is still required to ensure a standardized and safe approach to etoposide prescribing, dispensing and labelling.

256 EDUCATION OF A NATION – ESTABLISHING A NEEDS-BASED EDUCATION APPROACH

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Background In the Solomon Islands, Pharmacy Officers (PO) are professionals (not registered pharmacists) solely responsible for the distribution and dispensing of medicines within remote districts. PO have completed a Certificate of Pharmacy Practice but require further training to improve medicine availability and use across the nation.

Aim Establish competency standards (CS) that reflect a profession-wide vision for PO practice, meet national medicine needs and act as an educational framework for future training programs.

Methods A literature search found 6 existing PO CS from around the world. 4 CS were found to be contextually appropriate for the Solomons and collated into draft CS. Validation of the draft CS was completed via 4 structured 1:1 interviews, 3 workplace observation studies and 2 focus groups. Following validation, the project steering committee completed three reviews until a final consensus was reached among key stakeholders.

Results The CS were organised into 5 domains, Domain-1: Stock procurement, receipt and storage, Domain-2: Stock...
Distribution and Returns, Domain-3: Pharmaceutical Care, Domain-4: Organisation and Management Skills, Domain-5: Personal and Professional Qualities. Each domain has two subsections; a description of the competency and its associated common behaviours. Behaviours were divided into 87 beginner and 60 advanced behaviours. Four key themes emerged in the differentiation of beginner and advance practice including human resource management, problem solving, organisational skills and pharmaceutical knowledge.

Conclusion The CS reflect essential skills for effective PO practice. These standards can be used to develop needs-based educational approaches for either beginner or advanced PO training.

257 BARRIERS AND BENEFITS - PHARMACIST PRESCRIBERS' VIEWS OF THE PRESCRIBING ROLE

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Aim This study aimed to explore pharmacists’ perceptions of the impact of their role as prescribers before and after the implementation of pharmacy prescribing trials.

Methods Semi-structured interviews were conducted with pharmacist prescribers prior to the initiation of prescribing trials, and 6–12 months post service implementation. Interviews were audio recorded, and transcriptions were coded and thematically analysed using NVivo® software.

Results Six pharmacists across five prescribing trials were interviewed. Analysis revealed the emergence of five themes: patient care, attitudes to pharmacist prescribing, professional practice, education and training and service implementation.

Perceived benefits of pharmacist prescribing were improvements in patient safety, access to medicines and efficiency. All participants were confident they could ensure safety and quality of prescribing, and services were well received by local healthcare teams.

Participants considered that prescribing facilitated personal development, improved multidisciplinary collaboration and had the potential to advance the profession. Attitudes towards prescriber training were mixed; some found it beneficial, some felt it added little to existing competence and others found specific elements useful.

Factors facilitating implementation of prescribing activities included support from service managers and medical consultants, as well as funding to undertake prescriber training. Barriers to service implementation included prescribing approval requirements and patient consent processes.

Discussion This study is part of a larger evaluation of allied health prescribing initiatives across Queensland Health. Findings indicate that expansion of pharmacist scope of practice to include prescribing has patient care benefits, and is supported at a local level. Identified barriers will inform future prescribing implementation.

258 INCREASING PRODUCTION AND REDUCING WASTE – JUST IN TIME VERSUS READY ON TIME

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Aim To evaluate the impact of a lean production model on chemotherapy compounding efficiencies within a hospital-based compounding unit.

Methods A two-day advanced manufacturing process was previously implemented to maximise production and ‘on-time’ product release while reducing waste. This study retrospectively reviewed production output and utilisation from January–April 2018 to assess the volume and cost of manufactured products: 1) administered as scheduled; 2) recycled (administered following secondary compounding); and 3) expired.

Results Over the four-month audit period 13,944 products were manufactured with 99.5% (n=13,099) administered as scheduled, 3.5% (n=490) recycled, and 3.0% (n=415) expired. Based on 5 day/week production cycle, this equated to daily output of approximately 154 products administered as scheduled, 6 products recycled, and 5 products expired. More than half of products available for recycle were recycled to prevent drug waste equating to $52,665. Drug waste associated with expired product was equated to $45,108 (Avg. $11,277 per month). The highest volume expired products were paclitaxel (n=54), oxaliplatin (n=54), carboplatin (n=47), cisplatin (n=40) and gemcitabine (n=34). Both high volume expiration of low cost products and low volume expiration of high cost products contributed to drug expenditure costs for expired products: paclitaxel ($2,254, 54 products), pembrolizumab ($17,408, 2 products), etoposide ($6,022, 22 products), nivolumab ($10,517, 2 products), and trastuzumab ($3,018, 1 product).

Conclusion Lean production model resulted in <10% of products requiring secondary compounding or expiration.

259 MEDICATION TROLLEY SAFETY ON THE REHABILITATION UNIT: PHARMACY ASSISTANT LED INTERVENTIONS

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Aim The aim of this project is to improve medication safety by quantifying the extent of inappropriate medications found in medication trolley draws using pharmacy assistant screening and to
Conclusion The pharmacy assistants identified and removed 224 inappropriate medications stored in medication trolley draws. This highlights the need for a consistent clinical unit-based pharmacy assistant service on the RU. With over a third of checked medication draws having at least one inappropriate medication even with PYXIS access, alternatives to this error prone delivery system should be investigated.

Methods Data were collected in two 8-week periods in a 25-bed rehabilitation unit (RU). In the first period the national inpatient medication chart (NIMC) was reconciled with medications in the patient’s medication trolley draw. This was compared with the second period in a clinical unit with PYXIS. During the data collection periods, draws were checked weekly to quantify and remove inappropriate medications.

Results During the audit 349 NIMCs were compared, with 370 interventions recorded. 224 inappropriate medications were removed with 29% of medications being ceased, 54.5% were non-prescribed medications, 2.2% were medications not prescribed to the patient and were from an unknown source, 5.5% were labelled for other patients, and 8.5% were inappropriate strengths.

The percentage of draws with incorrect medications was on average 45% for non-PYXIS and 32.55% for PYXIS facilities. The number of draws checked requiring intervention was 53.6% and 51.88% for non-PYXIS and PYXIS facilities respectively.

Conclusion The pharmacy assistants identified and removed 224 inappropriate medications stored in medication trolley draws. This highlights the need for a consistent clinical unit-based pharmacy assistant service on the RU. With over a third of checked medication draws having at least one inappropriate medication even with PYXIS access, alternatives to this error prone delivery system should be investigated.

260 AN INTERACTIVE LEARNING PROGRAM: PHARMACISTS AS LEARNING SUPERVISORS

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Aim We aimed to design, deliver and evaluate an interactive program, inclusive of a simulated activity, to engage senior pharmacists with the theory and practice of clinical supervision.

Methods A 3-module workshop series was designed to enhance junior pharmacist learning in the clinical setting through provision of meaningful feedback, expectation setting and orientation. Each module included pre workshop activities, reflection activities and questions regarding their preconceptions about supervision. To complete the program, participants were provided with feedback and a learning action plan following their completion of a simulated feedback activity. Participant perceptions of what they would gain from the program were collected prior and the program was evaluated by participant survey and collation of learning action plans.

Results Ten pharmacists were selected to participate whereby prior perceptions acknowledged having few formal opportunities to develop as learning facilitators. A learning plan was developed for each participant following the simulated feedback activity with follow-up undertaken to ensure learning plans had been enacted. An evaluation survey was completed by 8 of the 10 participants who all indicated that they had applied new knowledge to junior pharmacist training and would highly recommend the course to others. There was a reported increased engagement with feedback provision and affordance of clear learning opportunities. Challenges experienced in applying learnings included time limitations and requiring further experiences in providing feedback.

Conclusions The program was a resounding success and the program, inclusive of the simulated activity, now forming part of senior pharmacist learning curriculum.
applicable for an advanced scope pharmacy technician working in a clinical support role.

**Conclusion** Use of an advanced scope pharmacy technician is an excellent way to increase the impact of a clinical pharmacy service. Identifying and gaining a consensus in the required competencies (knowledge, skills and behaviours) that underpin an extended scope role is essential in supporting an advancing scope of practice for pharmacy technicians.

**Methods**

1. A literature review was completed to identify a list of responsibilities which may be applicable to an advanced scope clinical support pharmacy technician.
2. A survey was developed to evaluate the workforce beliefs regarding roles and responsibilities of an advanced scope pharmacy technician.
3. Participants from a large tertiary hospital were invited to complete the survey and the results were analysed.
4. The roles and responsibilities identified will be used to further support consensus in an advancing scope of practice.

**Results** Preliminary results show that there is not a clear consensus within the pharmacy workforce regarding the roles and responsibilities of an advanced scope pharmacy technician.

**Conclusion** Use of an advanced scope pharmacy technician is an excellent way to increase the impact of a clinical pharmacy service. Identifying the beliefs of the pharmacy workforce (in regards to roles and responsibilities) has the potential to be used to identify opportunities and barriers in an advancing scope of practice for pharmacy technicians.

**Methods** In September 2017, a two-week placement was piloted in a Victorian metropolitan health network. One pharmacy student joined six students from medicine, nursing, occupational therapy, physiotherapy and social work disciplines. Students worked as a team with oversight from an interprofessional facilitator to provide patient care for 12 beds in a geriatric medicine ward. With facilitator direction, the team prepared daily plans, identified care requirements, timing of care and which students would take part. Health discipline facilitators provided supervision and opportunities for interprofessional learning. Pilot objectives (to provide an interprofessional learning environment and student-led placement, multidisciplinary learning opportunities, patient-centred care, and support students in developing discipline-specific skills) were evaluated using validated tools including patient experience surveys, clinical facilitator surveys and student feedback.

**Results** Pilot objectives were met and positive outcomes were reported for all evaluations. Students reported adequate team work and support. Facilitator observations included self-direction and acknowledgement of all discipline roles. The pharmacy student valued interprofessional learning and working within a team.

**Conclusion** The IPP provides a unique opportunity for students to gain insight into roles and responsibilities of other health professionals and develop skills in teamwork and collaboration. Additional placements have been implemented in 2018.

**Methods** We are undertaking a 5-year multifaceted workforce redesign program including assistant workforce career development. In June 2018 an interactive abstract writing session was held at a voluntary networking breakfast aimed at building confidence and competence in preparing an abstract. At the beginning and conclusion of the session participants were asked to score their feelings (calm, 3 (worried) through to 5 (acting out) towards preparing an abstract. The number who had previously authored an abstract and number having a topic for an abstract prior to the session commencing was recorded. During the 40 minute facilitated session participants brainstormed ideas in groups of 6-8 to form a skeleton of an abstract. Over the following 2 weeks coaches supported the
Aim To evaluate the role of a pharmacist in a hospital's immunisation centre for complex, high risk paediatric patients and their families, during a nationwide shortage of influenza vaccine.

Methods The role of the immunisation pharmacist began on April 16 2018. Supply of influenza vaccine was affected from May 7 2018. The number of patients seen each day in the immunisation centre was recorded using an Electronic Medical Record (EMR). Data were also recorded for phone calls received daily via the immunisation advice line. These data were collected and compared in the months of April, May and June, in 2017 and 2018.

Results Twenty-four assistants were supported by four coaches. Two had submitted abstracts previously. Two intended on submitting an abstract in the coming 3 weeks. The average feeling towards abstract preparation was 2.3 pre and 1.8 post indicating an overall improvement by 22%. By then end of the session there were 8-10 strong ideas for abstracts.

Conclusion A coaching model for assistants enhancing confidence in preparing and submitting abstracts has successfully been utilised. The skills gained by assistants from this method of development have the potential to be utilised in many diverse scenarios to critically review, innovate and evolve processes and ensure the transference of evidence into practice.

Results The cohort of clients that received a MRS had complex medical and psychiatric comorbidities. It was found that there was disconnect between medical and mental health management. The pharmacists identified many actual and potential medication problems resulting in changes that had very significant impacts on clinical outcomes and quality-of-life. As some clients had decades of contact with mental health services, the MRS process was comprehensive but time-consuming. Aside from medication reviews, the pharmacist followed-up on changes resulting from recommendations, did short consultations, provided education to clients and staff, answered medication enquiries, and assisted with medication policy development.

Conclusion Pharmacists can improve client outcomes by providing a MRS to CMHCs. Integrating a pharmacist onsite into the team reveals scope to expand the role to provide other services.
gathered retrospectively from the ieMR. Data were collected on the verbal orders and compared with retrospectively charted medications as reflected in the MAR records.

**Results** A total of 54 medications were administered to the sample of 62 patients. It was found that 18/54 (33%) medications documented as administered in the electronic progress notes during the resuscitation event were not charted retrospectively into the electronic medication administration record. The most common medicine not charted was fentanyl (6/18). Examples of other drugs not charted were ketamine (3/18), propofol (1/18), prothrombinex, and midazolam (1/18). 6% (3/54) of medications administered were charted incorrectly on the MAR when compared with the verbal orders recorded on the progress notes at the time of resus.

**Conclusion** A pharmacist within the resuscitation team in the emergency department would reduce medication errors by prospectively charting medications directly into the ieMR system and increase the accuracy of retrospectively charted verbal orders. Pharmacists would be an asset within the team and could be involved in intravenous medication administration, drug calculations and drug information.

**Methods** The study was an observational fully crossed design of nurses administering medications in a recorded simulated clinical environment. There were: a) 8 recorded scenarios; b) 3 nurse educators viewed the recordings and evaluated the nurse administering medications using the designed tool; c) the same 3 nurse educators viewed the recordings again 7 days later.

There were 22 criteria in the tool with ratings of yes, no and not applicable. A total of 176 ratings for each observer. The intra-rater and inter-rater consistency of agreement for each rater and between raters was determined using Fleiss’ kappa and average percentage agreement.

**Results** Results showed the intra-rater agreement percentage for each observer and overall comparison ratings for both time points ranged between 81.25% and 84.28%. The inter-rater average percentage agreement for both time points and overall ranged between 79.35% and 84.47%. The overall Fleiss’ Kappa statistic for intra-rater reliability was 0.72 and inter-rater reliability was 0.68. The evaluation criteria for kappa agreement of 0.60-0.74 rates the tool as good. Therefore, overall intra-rater and inter-rater reliability of the tool was good.

**Conclusion** The study shows that the designed medication administration evaluation and feedback tool is reliable in a simulated clinical environment. Further studies are being conducted to test the reliability of the tool in the clinical setting.
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Aim To describe an innovative approach to medication safety education for nurses.

Methods In consultation with the nursing education department of a university teaching hospital, pharmacists initiated a one-hour, regular, monthly, interactive ‘drop-in’ session for nurses. The session provides nurses with an informal opportunity to consult pharmacists and ask any medication-related questions. Nurses are also given the opportunity to run through pre-prepared scenarios based on commonly observed medication incidents, allowing them to familiarise themselves with web-based medication information resources. An evaluation form was made available at the end of each session to assess the impact of this approach.

Results To date, 47 nurses have attended 4 sessions with 23 nurses completing an evaluation form. 100% of nurses who completed the evaluation reported that the session would improve their practice with regards to medication safety. 96% of respondents reported that their knowledge of medication safety had improved after the session. The average self-reported knowledge level prior to the session was 2.5/5 compared to 4/5 after the session. 91% reported that they found the session very useful to their practice.

Conclusion Medication administration errors are one of the most common errors that occur in hospitals with serious potential for patient harm and are all preventable. Pharmacists have expert knowledge in medication safety and a responsibility to take a proactive role in multidisciplinary education. By providing an informal and flexible learning environment, pharmacists can raise awareness and improve the medication safety culture of the organisation. The sessions also help identify future educational needs.

271 ETHICAL REASONING: RESOURCES USED AND PRIVACY ISSUES IDENTIFIED BY PHARMACY INTERNS
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Background A solid foundation of ethical practice is essential to facilitate quality patient care and maintain the professional standing and integrity of the pharmacy profession. Pharmacists are increasingly confronted with ethical dilemmas as patient-centred healthcare expands and increases in importance. Pharmacy interns should apply ethical reasoning skills gained at university and continue to develop those skills as they mature professionally.

Objectives To explore the resources used by pharmacy interns to inform their ethical decision-making processes and exposure to potential privacy breaches in practice.

Methods A survey to 1) evaluate resources used and processes followed to solve ethical dilemmas; 2) assess the frequency of ethical scenarios involving privacy in practice contexts.

Results A total of 121 pharmacy interns participated, involving 117 who completed surveys at four intern training workshops (August to December 2017) and another four who responded to an online survey. Codes of Ethics and Conduct were rated by 63 (52.1%) as the most relevant resources consulted, with the Pharmacy Board of Australia resources rated most relevant by 56 (46.3%). Regarding frequency of privacy scenarios, 66/120 (55%) indicated that they had observed collected medicines being visible to other consumers on a daily or weekly basis.

Conclusion The study provided insight into interns’ ethical reasoning processes and resources used. Privacy challenges experienced by interns emphasised gaps in staff knowledge about confidentiality requirements, protecting patients’ health information and providing safe and trusting environments. Resources consulted by interns were appropriate although there is scope to explore better assistance from experienced co-workers and preceptors.
Methods A retrospective review of documented ClinCAT action plans was undertaken. A survey was used to interview pharmacists who received feedback to identify the following: whether they had achieved the objectives identified from their action plan, if the objectives were achieved within the proposed time frame, and what were any perceived barriers to completing the objectives.

Results A total of 59 ClinCATs were reviewed in which 161 objectives were documented in the action plan. Of the objectives reviewed, 55% (n=89) were actioned and of these 50.5% (n=45) were completed within the suggested time frame. More common barriers to completing the objectives included time constraints, lack of follow-up and objectives no longer being relevant due to change in role or rotation. Other barriers included forgetfulness and a lack of understanding and availability of resources required to complete the objectives. In response to these results, 3-month follow-up appointments following ClinCATs have been implemented.

Conclusion This review demonstrates not all action plans will be completed and adhered to. Further strategies should be implemented to improve the follow-up of observational evaluations to ensure optimal continued professional development of pharmacists.

273 ADVANCED PHARMACY ASSISTANTS TAKING BEST POSSIBLE MEDICATION HISTORIES TO ENABLE PHARMACY’S BEST POSSIBLE CLINICAL SERVICE
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Aim To show the impact of Advanced Pharmacy Assistants in a clinical setting and provide evidence of an increase in patient contact by the Pharmacy Department.

Methods Advanced Pharmacy Assistant roles were created in the Pre-Admission Clinic and Emergency Department. The Assistants were required to complete structured training and assessment to achieve competency in taking a medication history. This created a more efficient and prominent pharmacy service. The Advanced Pharmacy Assistants were introduced to these areas to enable the Pharmacists to spend more time in clinical practices and direct patient care.

Results There is clear evidence of an increase in patients seen by the Pharmacy Department after the introduction of an Advanced Pharmacy Assistant. An approximate 50% increase in the number of patients seen by the Pharmacist within the Emergency Department – increasing from 50 per week to 74 per week. The addition of an Advanced Pharmacy Assistant to the pre-admission service alleviates the need for a second Pharmacist, allowing one Pharmacist to review up to 14 patients per clinic. This represents a 75% increase from the previous limit of 8 patients per clinician which still applies to nursing and anaesthetics.

Conclusion The implementation of the role of an Advanced Pharmacy Assistant had a significant impact on these clinical areas and optimised the valuable clinical time of Pharmacists. These innovative roles have provided an opportunity for Advanced Pharmacy Assistants to become more involved in the direct clinical care of patients.

274 RESIDENCY LEADING THE WAY
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Aim To evaluate the impact of the residency program on the professional development of non-resident pharmacists at a tertiary hospital.

Methods
1. Anonymous, voluntary survey to evaluate staff attitudes pre- and post-commencement.
2. Six month pre- and post-commencement audit investigating the number of peer review performed and evaluators available to non-resident pharmacists.

Results All staff were invited to participate in the pre- (n=39) and post-commencement (n=31) survey. An increase in staff’s overall understanding of a residency program (56% to 74%); the belief that the pharmacy department offers adequate professional development (49% to 55%); and that the program will benefit both residents (85% to 90%) and the department as a whole (74% to 77%) was demonstrated. The number of ClinCATs performed on non-residents increased from 8 to 10 and the number of ClinCAT evaluators from 5 to 9. The non-resident pharmacists now have access to the following peer review tools via an expression of interest: Case-based Discussion (CbD), mini-Clinical Evaluation eXercise (mini-CEX), and Direct Observation of Practical Skill (DOPS).

Conclusion There existed a risk that the residency program would be implemented at the expense of the professional development of non-resident pharmacists. In fact, it seems to be turbocharging the professional development of the department as a whole without leaving anyone behind.
PRESCRIBING TRENDS OF OPIOIDS IN CHILDREN POST-TONSILLECTOMY

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Background: There are concerns of the unwarranted use of opioids in children due to increased sensitivity and varying metabolism that may cause adverse effects.

Aim: To audit the management of oropharyngeal pain in children post-tonsillectomy within a tertiary paediatric hospital and determine opioid prescribing trends to guide safe and effective prescribing.

Methods: Medication charts and dispensing histories of patients post-tonsillectomy were reviewed from January 2014 to December 2017. Reports of tonsillectomies performed were matched with discharge opioid dispensing reports. The following parameters were reviewed: opioid analgesics, non-opioid analgesics, non-pharmacological interventions, adverse events, and readmission. A literature review of analgesia used in the paediatric population post-tonsillectomy was completed. Practices at other paediatric hospitals were surveyed.

Results: The literature review and surveyed paediatric hospitals indicated variable practices regarding opioids currently being prescribed. From the audit, 1106 patients age range 1–18 years (median age=6.5 years) had 966 tonsillectomy with adenoidectomy and 140 tonsillectomy without adenoidectomy. Patients were routinely recommended regular paracetamol and/or ibuprofen when required. Opioid analgesics prescribed were mainly oxycodone, when required. Oxycodone prescribing demonstrated a downward trend: 44.1% in 2014 (128/290), 54% in 2015 (142/262), 16.2% in 2016 (48/297), and 29.2% in 2017 (75/257). Oxycodone prescribed was demonstrated to be higher during the first half of each year than the second, coinciding with prescribers clinical rotations.

Conclusion: There are variable practices with regards to the prescribing of opioids post-tonsillectomy. Opioid analgesics should be reserved to treat oropharyngeal pain unresponsive to other measures and non-pharmacological measures should be encouraged.

277 IT’S TIME TO FOCUS ON WEIGHT MANAGEMENT DURING CANCER TREATMENT – A TEAM APPROACH!

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Background: Weight loss is common among cancer patients. Causes may be due to reasons such as side effects from cancer/treatment. Although dose adjustment is recommended should patient’s weight change by 10%, there is limited evidence and guidance to support such practice.

Aim: This quality improvement project aims to: improve the current documentation process, prioritise prompt referrals for dietician review, and develop a unit guideline to ensure project sustainability.

Methods: Patients on palliative treatment were randomly selected in January 2018. Treatments were divided into three phases: weight recorded at initial, mid and current/last cycle. Weight differences between mid and initial cycle were compared with the current and mid cycle. A discrepancy of 5kg was chosen as an arbitrary weight for intervention due to the elderly population. Discrepancies of weight monitoring were presented to staff at meetings to raise awareness.

Results: Fifty patients were selected. Twenty-one patients had 5kg change noted. Issues were discussed at the multidisciplinary meetings to encourage vigilant weight monitoring (doctors, nurses, pharmacists and dietitian). A follow-up review of the weight differences at mid to current cycle was undertaken one month later and found 11 patients had weight change of >5kg. A unit guideline was developed to maintain project sustainability and prompt dietician referral to better support patients’ needs.

Conclusion: Cancer patients’ weight monitoring and documentation are paramount to guide accurate and appropriate drug dosing, and facilitate prompt referral for dietician review. This audit demonstrates a cohesive team approach is important to better support patients throughout their cancer trajectory.
Aim  To improve the knowledge of medication safety among 48 Junior Medical Officers (JMO) at a major tertiary hospital by presenting weekly cases of medication-related incidents and ways in which they can be avoided.

Methods  The Medication Incident Review Committee assesses medication-related incidents extracted from the hospital’s incident reporting system and selects incidents to be used as examples to educate the JMOs. The Medication Safety Pharmacist and Specialist Geriatrician present a 5-minute “Medication Mishap” at the start of weekly JMO teaching forums. Each presentation consists of a scenario that happened in the hospital and the JMOs are asked to predict what the outcome was. The JMOs are then told of the outcome and ways in which to avoid this incident from occurring in the future. A medication safety take-home message is then presented to the JMOs. As an incentive for safe prescribing, clinical pharmacists nominate JMOs to be presented with the “Prescriber of the Month” award.

Results  A feedback survey was completed by 25 out of 48 (52.1%) JMOs. Results showed that 88% of JMOs found “Medication Mishaps” to be very or extremely useful and 92% of JMOs had improvement in their knowledge in medication safety. 92% of JMOs liked the idea of the “Prescriber of the Month” award.

Conclusion  Education by pharmacists empowers JMOs to understand the basic principles of medication safety, good prescribing practices and their effect on patient outcomes.

Conclusion  The establishment of an AMS Network has successfully connected pharmacy staff across Australia, improving access to shared resources and expertise, particularly pertinent for regional areas without ID physician/microbiologist access. Further support for pharmacists in antimicrobial TDM is warranted. A trial of an electronic Bayesian dosing platform has been conducted, with a training and competency package underway.

Method  A network was established in 2016, recruiting representatives from each pharmacy site, overseen by a Working Group of pharmacists experienced in AMS. A baseline survey was conducted to ascertain the level of involvement in AMS activities. Communication and shared resources were developed, and a repeat survey was conducted in 2018.

Results  In 2018, 48% of facilities serviced are located in regional areas; of these only 45% have access to an infectious diseases (ID) physician or microbiologist. Since the network was established, facilities receiving AMS education from pharmacists increased from 33% to 52%, reporting of antimicrobial usage data increased from 63% to 79% of facilities, auditing of antimicrobial prescribing is now conducted at 69% of facilities (increased from 44%), and pharmacy involvement in other AMS activities (e.g. promotional campaigns, guideline development) increased from 33% to 74%.

Pharmacist involvement in therapeutic drug monitoring (TDM) decreased from 44% to 36%.
Workforce / practitioner development

Results Questionnaire results showed that 90% (19/21) of participants believed CDG topics were relevant to their practice and 76% (16/21) indicated CDG has built on their clinical knowledge and helped them become more professionally confident. Furthermore, 95% (20/21) of participants felt that CDG was interactive, and 81% (17/21) were comfortable to share their experiences and contribute to the discussions. However, 67% (14/21) did not refer to archived minutes.

Conclusion Most ECHP participants felt the CDG model of learning improved their clinical knowledge and positively impacted on their professional confidence. Areas of improvement include promoting the use of archived minutes.

Aim To develop a single core learning plan for general and specialised rotations to support preceptors teaching, a continuum of learners including pharmacists, residents, interns, students and clinical pharmacy assistants.

Methods A state-wide learning plan template was developed to provide structure for the development of key individual learning plans across all sites. Learning objectives were developed by pharmacist representatives from each local health network working in the designated clinical area to ensure collaboration and consistency. Consultation was undertaken with clinical assistants to ensure learning objectives were broadly applicable. Final version of learning plans were approved and endorsed by the state-wide pharmacy educator group and executive management team. Strategy implementation included development of a state-wide procedure to guide learning plan utilisation, enabling access via intranet webpage and educational visiting.

Results A total of 18 state-wide learning plans have been developed for areas including dispensary, manufacturing, general medicine, surgical, cardiology, mental health, renal, thoracics/respiratory, stroke/neurology and palliative care. The learning plans are used during student placements, intern rotations and electives, pharmacy residency program and pharmacists rotations. Achievement of learning plan objectives are best highlighted through setting clear goals with learners at commencement of rotation, assessed through direct observation of practice and undertaking active discussion during rotation.

Conclusion Learning plans are useful tools, providing a structure to teaching and learning in the work practice. Strategies to further improve utility include video development. Implementation of the state-wide learning plans has led to a standardised approach and increased collaboration in clinical areas across sites.

Results There are similarities between PPRs and EPAs – both are discrete tasks or responsibilities that are mapped to a competency matrix. PPRs are also observable activities that are measurable and have a designated time frame. With PPRs the unit of assessment is the ability of an individual pharmacist, for an EPA the unit of assessment is the outcome of the activity. Both PPRs and EPAs are embedded in the clinical context and focus on integration of competencies needed to deliver pharmaceutical care assessment.

Conclusion With EPAs supervisors entrust the learner to undertake these discrete tasks unsupervised once they have achieved adequate competence. Use of this language is critical, and we have identified several areas where the PPRs could be adapted to facilitate learning as an EPA, including removing labelling such as ‘review’, and removing adjectives that refer to proficiency levels, and ensuring the wording is neutral.
Methods An online survey was developed using results from a systematic literature review and qualitative interviews. It was released nationally, and registered pharmacists were invited to participate.

Results Responses were received from 124 pharmacists. Exploratory factor analysis was used to investigate relationships between items on the survey and reduce the data into smaller components. From this several factors emerged including ‘overall preparedness’, ‘responsibilities’, and ‘threat’. Multiple linear regression was undertaken to investigate the relationship between participants’ preparedness scores and identified factors. There was a significant relationship between preparedness and pharmacists’ previous attempts to prepare themselves (p=0.025), support availability (p=0.002), previous information seeking behaviour about a disaster (p<0.001), previous disaster experience (p<0.001), belief about potential disaster severity (p=0.012), and pharmacists belief that they have the knowledge and skills respond to a disaster (p=0.016). The adjusted R² was 0.752 meaning 75.2% of variation in preparedness can be explained by the model containing these factors.

Conclusion Multiple factors influence pharmacists disaster preparedness. A better understanding of these factors could lead to improved interventions and available support for pharmacists’ disaster preparedness and response. A prepared pharmacy workforce could improve the healthcare sector’s response and skills mix during disasters as well as patient care.

284 PHARMACY AUTOMATION: MEASURING THE EFFECT OF WARD-BASED AUTOMATION ON INPATIENT DISPENSARY SERVICES

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Aim Pharmacy automation is emerging: the introduction of robotics, computerised systems and advancing technology. Here we review the impact on dispensary workload after implementing ward-based automation within our public hospital service.

Methods We introduced automation in the form of automated dispense cabinets (ADCs) across 84 wards and 35 theatres, with the change enabling capacity of up to 240 different medications into each ADC. We reflect on this transformation by performing retrospective point investigation over February, March and April, establishing the impact of automation on everyday dispensary workload. We performed an independent statistical t-test with significance level of 0.01 over 3 randomized days, assessing pre-automation in 2017 and post-automation in 2018. 4 ADCs were used during the pre-automation period and at the time of data collection for 2017.

Results The study revealed a significant median workload reduction of 63% per day, with the number of inpatient dispensing down from 539 (SD = 89) to 199 (SD = 11) per day (t = 6.54, P = 0.0028). The introduction of automation has increased the accessibility of medicines on the ward; improving nursing and pharmacy efficiency by preventing the additional step of inpatient dispensing.

Conclusion Automation in our hospital service has significantly reduced the daily number of inpatient dispensing. We identify this significant reduction of inpatient dispensing to optimize patient care by delivering medication more efficiently than conventional non-automated practice.

285 A NOVEL HOSPITAL PHARMACIST ROLE WORKING WITH ABORIGINAL & TORRES STRAIT ISLANDER CARDIAC PATIENTS

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Aim A multidisciplinary team was established at a large tertiary referral hospital in 2015 to improve access, support and health literacy for Aboriginal and Torres Strait Islander patients requiring cardiac care. In March 2016 a pharmacist joined the team on a part time basis.

Methods In addition to traditional clinical pharmacist roles in medication optimisation, the scope of this role has expanded to ensure continuity of care when patient’s transition between care settings. This is achieved by improving relationships and clinical handover processes between the acute and community setting and obtaining site-specific funding approval for Closing the Gap medication access. Pharmacist-driven initiatives include the provision 7-day medication supplies, heart failure medication titration plans to general practitioners, encourage NRT utilisation and enrolment to community smoking cessation program, prevention and optimisation of diabetes. Patient education and centred care represents a large focus of the role, while existing community programs are navigated for patient benefit.

Results The pharmacist role has been well supported by the team, the cardiology department and the pharmacy department. Between April 2015 and Jun 2018, 599 patients were seen; 27 had heart failure titration plans completed; 15 had quit smoking support; 9 had diabetes recommendations. The team achieved clinical successes with a reduction in the 28-day readmission rate from 10.81% to 8.64%, and an increase in general practitioner follow up within seven days of discharge from 46% to 82%.
Conclusion A dedicated pharmacist can make important contributions to a multidisciplinary team working with A&TSI cardiac patients.

286 THE IMPACT OF INCLUDING A PHARMACY ASSISTANT (PA) IN THE PHARMACY PRE-ADMISSION CLINIC (PAC)

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Aim To quantify the impact that the presence of a PA has on the achievement of PAC key performance indicators.

Methods Inclusion criteria were used by the pharmacist or PA to identify and prioritise patients requiring review from the daily PAC appointment list.

Data relating to the daily number of patients identified for review and the number of completed best possible medication histories (BPMH) produced in PAC were collected over six months.

This dataset was divided into periods where the pharmacist worked alone, and where the PA assisted in the BPMH generation process.

Potential activity-based funding was compared to operational costs for that period.

Results Working alone, the pharmacist identified an average of 5.4 patients for review and completed 4.8 BPMH (n=27).

When the PA assisted, an average of 7.7 patients were identified and 7 BPMH were completed (n=62).

The daily labour cost of service provision with the pharmacist alone was $399, increasing to $627 when the PA provided assistance.

Conclusion The inclusion of a PA in the PAC resulted in:

• 41.9% increase in patients identified.
• 46.9% increase in the number of BPMH produced daily.

Although inclusion of a PA increased cost per service from $83.48 to $89.24, there was a daily cost benefit to the hospital of an extra $1618 income when the PA assisted in the PAC.

287 A MULTI-HOSPITAL VICTORIAN COLLABORATION TO DEVELOP A STANDARDISED TECHNICIAN ROLE EXPANSION FRAMEWORK

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Aim To collaborate across five metropolitan health services to consolidate and expand the role of hospital pharmacy technicians by developing a consistent approach to education and training.

Methods A collaborative of five health service pharmacy departments identified technician roles within their hospitals where either existing roles could be improved or an expanded role could be implemented. Consistency in education and the training, evaluation, and accreditation of key dispensing and clinical support roles across the organisations were identified as areas for development. Each department identified a role (e.g. technician education, dispensing credentialing, technician checking, and critical drug management and supply framework) and accepted responsibility to create frameworks to develop, monitor and evaluate the implementation of the respective role across all the health services.

Results Hospital pharmacy technician education, training and credentialing packages were developed to build on the training provided by the Hospital/Health Services Pharmacy Support qualification. Education packages were based upon an agreed template to provide consistency and included an assessment of understanding. The training and credentialing packages included a dispensing accuracy assessment for pharmacy technicians to provide a standardised process to monitor dispensing accuracy, following on with consolidation of skills progressing to a technician checking program. Other technician education and training packages are forthcoming.

Conclusion This collaborative endeavour has allowed for rapid development of multiple packages for technician advancement within hospital pharmacy. Collaborative efforts have reduced individual workload, prevented duplication of work, and allowed for the undertaking of multiple complex and challenging projects in an efficient and timely manner.

288 IMPROVING ACCESS TO ACUTE STROKE TRIALS USING AUTOMATED DISPENSING CABINET

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Background Increasing number of investigational products (IPs) for stroke trials requires prompt 24-hour access.

Aim To describe the process of implementing IPs into automated dispensing cabinets (ADC) in the Emergency Department and show some benefits and limitations compared to after-hours room (AHR) storage.

Methods Five acute stroke trial IPs were considered for either ADC or AHR storage. Three were suitable for ADC while two were placed in AHR.

ADC was linked to dispensary software and pharmacy email. Each transaction is electronically recorded and emailed. IPs selected for ADC were marked “clinical trial use only”, stored in dedicated
Workforce / practitioner development

compartments and expiry dates entered into the system. Separate inventory codes and prompt alerts were created. Study investigators were surveyed for average access time using ADC and AHR.

IPs placed in AHR were for blinded studies where treatment kits are numbered and specifically assigned to subjects. Blinded study products could not be placed in ADC due to possible selection and re-stock error.

Results ADC provided benefits over AHR, including:

- Reported access times improved from 20 minutes during pharmacy hours and up to 45 minutes after hours to only 5 minutes.
- Automated daily reports provided:
  - Inventory control and continuous availability.
  - Prompted expiry checks.
- Real-time accountability, mandatory for clinical trials records.
  - Eliminate need for after-hours coordinator to access IPs.
  - Unique inventory codes and alerts provide preventative measures for selection-error.

One limitation identified was restricted space for blinded trials.

Conclusion The successful implementation of IPs into ADC provided many benefits.

289 IT'S TIME TO UPSKILL: CARDIAC ARREST BOXES MANAGEMENT, A NEW ROLE FOR PHARMACY TECHNICIANS

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Aim To evaluate a credentialing package delivered by a pharmacist to enable pharmacy technicians to independently manage the packing and distribution of cardiac arrest boxes (CABs).

Methods Pharmacists spend approximately 40 minutes weekly packing CABs, CAB management was proposed as an extended scope of practice for technicians. Given the importance of CABs, a credentialing package was created focusing on the clinical and procedural aspects of maintaining them. This package comprised of two clinical presentations and a practical tutorial with a pharmacist. Technicians were then assessed on their clinical knowledge and competency to pack and complete documentation on five mock CABs.

After the initial assessment, it was noted that whilst clinical knowledge was adequate, there were errors in documentation and packing. As such, a further assessment was added consisting of five real life CABs. Technicians were deemed competent if they achieved an accuracy rate of 99.5% in packing and documentation.

The impact of the credentialing package was assessed with a 7-item questionnaire.

Results Six technicians took part in the process and three were deemed competent. Of those successful, the additional education and assessment improved accuracy rates from an average 99.79% to 100% for packing and 99.23% to 99.8% for documentation. Questionnaire results indicate 80% of technicians agreed that the credentialing package improved their job satisfaction and knowledge of CABs.

Conclusion Despite the limitations of the initial credentialing package, augmentation to focus on documentation allowed for pharmacy technicians to develop the skills to independently manage CABs leading to improved job satisfaction.

290 IT'S TIME FOR SELF-REFLECTION: HOW DO WE MANAGE CONFLICT?

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Aim To utilise conflict self-evaluation tools to promote self-reflection among pharmacists and technicians during the critical stages of team-formation. To improve perceptions and increase capacity to positively manage conflict and enhance team leader (TL) knowledge of their teams’ styles.

Methods A survey was conducted to assess baseline understanding and self-perceived competency. The Zubin Austin Conflict Management Scale was completed by staff which was then discussed with their TL in a reflective discussion. A final survey was conducted to assess any changes.

Results Prior to completing this activity staff reported conflict made them “nervous”, “uncomfortable” and “uncertain”. Whilst 95% experienced conflict in the workplace, on a scale of 1–100 (1–not comfortable, 100–extremely comfortable) staff reported an average of 41 in their level of comfort managing conflict. Their comfort was increased by 43 was the average for self-perceived strategies managing conflict, which increased to 63.

Prior to the activity 76% of staff thought conflict could have a positive impact on team-functioning which increased to 100%. In the post-survey staff reported feeling “less scared” and “more comfortable”. All participants found the activity useful and 78% stated they would change their conflict management.

Three-quarters of TLs stated their knowledge of team members’ conflict styles had increased.

Conclusion Positive conflict management is vital during all stages of team-functioning but is particularly important during the initial stages of
forming/storming. Self-evaluation/reflection is an essential skill to increase competence in this area and contribute to the functioning of high-performing teams.

291 OPTIMISING DISCHARGE SERVICES FOR HAEMATOPOIETIC STEM CELL TRANSPLANT PATIENTS BY EXPANDING THE ONCOLOGY TECHNICIAN ROLE

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Background Haematopoietic Stem Cell Transplant (HSCT) patients are discharged from hospital with complex medication regimens differing from standard prescribing. Traditionally, HSCT discharge services were facilitated by staff untrained in this area and medication supplies were limited to 7 days.

Aim Expansion of the Oncology Technician role to improve pharmacy discharge services to HSCT patients in a private hospital.

Methods Retrospective analysis of HSCT discharges between April–June 2017 was undertaken using hospital and pharmacy medical records. The following were measured: 1) accuracy of indications and directions on the pharmacy discharge medication record (DMR) and 2) duration of supply provided. The existing oncology technician role was expanded allowing HSCT-patient discharges to be facilitated outside of the general dispensary. The role was responsible for introducing HSCT-specific dispensing codes within the dispensing and DMR systems and confirming the date of the patient’s outpatient appointment ensuring adequate supply of medicines. Records listed above were analysed for the same period of 2018 to measure the impact of the technician role expansion.

Results Pre-implementation data for HSCT patients in 2017 showed 93% of DMR’s contained inaccurate directions and 98% contained inaccurate indications. 71% of discharges provided inadequate quantities of medication. Following expansion of the Oncology Technician role, 100% of HSCT patients for the same period in 2018 were provided DMR’s with clinically accurate directions specific to their treatment plans and sufficient medication quantities supporting them until outpatient appointment.

Conclusion Expansion of the oncology technician role to support discharges for HSCT patients has significantly improved pharmacy discharge services.

292 ESTABLISHMENT OF A WORKPLACE-BASED EXPERIENTIAL CLINICAL PHARMACY TRAINING PROGRAM IN AUSTRALIA FOR CHINESE PHARMACISTS

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Introduction In collaboration with a Chinese pharmacy professional organisation, a clinical pharmacy training program was established at a large, metropolitan, teaching healthcare network in Melbourne, Australia. Providing workplace-based experiential training in Australia exposed Chinese pharmacists to well-developed clinical pharmacy, education and training services.

Methods Hospital pharmacists from China spent 24 weeks participating in the clinical pharmacy training program. The program was aligned with relevant International Pharmaceutical Federation (FIP) Workforce Development Goals, and focused on development of clinical pharmacy skills through structured training and assessment. Experiential training in a diversity of clinical specialties and pharmacy practice areas was provided. Chinese pharmacist participants were invited to evaluate the program via anonymous surveys and face-to-face meetings with the program coordinator. A validated clinical teaching feedback survey was utilised to provide feedback to supervisors.

Results Survey results demonstrated high levels of participant satisfaction. Areas most valued included: time spent with experienced pharmacists in clinical specialties, regular assessment and feedback from supervisors, and access to clinical governance resources.

Based on feedback and logistics, changes are being made to future programs to better meet the learning needs of participants. These include reducing the program to 12 weeks, with a greater focus on advanced, specialist and innovative roles and clinical governance development.

Conclusion The clinical pharmacy training program resulted in positive outcomes for both participants and supervisors, with changes being made to improve future programs. After completing the program, participants have been able to generalise and apply their learning to their hospital pharmacy workplaces in China.
Workforce / practitioner development

Background Clinical informatics is the application of information technology in healthcare. With increasing numbers of Australian health services implementing eMRs, pharmacists with clinical informatics expertise are making an important contribution. The SHPA Residency program, established in 2017, contains four 6-month rotations, including one elective rotation.

Methods The pharmacy department of a large multi-site teaching hospital implemented an SHPA-accredited Residency Program in March 2017, including observational clinical assessments at regular intervals. In 2018, the organisation began eMR implementation supported by a large Pharmacy Clinical Informatics team, with pharmacists involved in the implementation as trainers for over 5,500 pharmacy, nursing and medical staff. Residents undergoing elective rotations were identified and offered the opportunity to participate as trainers.

Results Three Residents participated in the first Clinical Informatics rotation as eMR trainers for five months. Residents undergo a two-week “train-the-trainer” program and then facilitate five four-hour staff training sessions a week. Assessment tools have been adjusted and developed to assist in the evaluation of the Residents during this time. Feedback from the Residents involved indicates they are excited to participate in this novel opportunity.

Conclusion Clinical informatics is becoming a core function of hospital pharmacy departments. A Clinical Informatics rotation can form a valuable part of a foundation Residency Program and should be considered as a potential core rotation for future Residency Programs.

Objective To implement an innovative recruitment method for a Pharmacy Residency program using “mini-interviews”.

Background The SHPA Residency Program was implemented in 2017 across many health services nationally. The program generated significant interest, with many candidates applying for the first intake at a large metropolitan hospital. An average of 12 potential candidates applied per available position. Recruitment is a time-consuming process, requiring staff who interview to spend considerable time away from their daily duties.

Methods A large, multi-site teaching hospital pharmacy department with an SHPA accredited Residency Program developed a recruitment strategy utilising “mini-interviews” for the second intake of the program. The initial interview was separated into three ‘stations’: reflection on practice, problem solving, and a clinical scenario. Each interview station was run by a single interviewer to ensure consistency in the evaluation, with candidates rotating to each station. Each interviewer scored the candidate out of ten.

Results During the second intake of residents (December 2017), twenty-seven candidates were interviewed for three positions. Three candidates were able to simultaneously complete their interviews, within a total time of 30 minutes. Efficiency was increased three-fold compared to traditional interviews. Following the completion of interviews each candidate was given a total score from each component ‘mini-interview’ to determine the final appointment decision.
Conclusion “Mini-interviews” demonstrated promise as an effective and efficient recruitment tool for Pharmacy Residency positions. There is the potential for these to be applied to other high volume recruitment scenarios, such as intern selection.

Background Pharmacists are often reported to be medication experts. Pharmacists attend wards and review medication charts daily. It is expected that pharmacists will effectively challenge inappropriate drug selection. 48% of all inpatients are on antimicrobials at any one time. National Antimicrobial Prescribing Survey shows the hospital performing poorly for all parameters. Compared to pharmacists, prescribers are a relatively transient workforce, often leaving/rotating in a hospital setting.

Objective To understand the ‘programmed knowledge’ of pharmacists and their effectiveness challenging doctors to prescribe antimicrobials appropriately.

Methods A voluntary anonymised written test based on recognised reputable national online training is offered for pharmacists. A ‘pass’ has been set at 80% as discussed with consultants and antimicrobial pharmacist.

A Likert rating of pharmacists’ perception of their effectiveness challenging suboptimal antimicrobial prescriptions will be compared to them challenging doctors for prescriptions with poor medication history.

Results 18 of the 32 (56.3%) pharmacists completed the questionnaire with mean score of 57.4% (highest 80.7%; lowest 29.0%); 95.0% perceived themselves effective challenging doctors for poor medication histories; 25.6% effective challenging doctors when suboptimal antimicrobial prescription is noted; 33.3% felt their antimicrobial knowledge was sound; qualitative text responses regarding both medication histories and antimicrobials highlight need for development.

Conclusion A qualitative and quantitative needs assessment identified specific gaps in programmed knowledge of pharmacists and their perceived effectiveness in challenging prescribers for antimicrobials. Effectiveness challenging poor medication history is significantly higher. A development program to enhance antimicrobial knowledge of pharmacists and their effectiveness in challenging suboptimal prescribing should improve outcomes.

Conclusion It’s TIME to launch an EDMH pharmacist service to reduce the TIME to review, TIME to intervention resolution and cost of out-of-hours calls.

Conclusion A team of pharmacists and the senior psychiatry registrar analysed the data from each group. It was found EDMH patients were less likely to receive a pharmacist review within 12 hours of presentation (2% vs 34%) and interventions took longer to resolve (5% vs 37% in 24 hours) supporting the ACEM findings. The most common interventions for EDMH patients were incorrect dose (26.5%), optimising dosing regimen (16%) and uncharted medications (16%).

The cost in 2017 for all calls by EDMH for supply of LAIPs and clozapine was $24530.26. Over half related to EDMH patients presenting during business hours.

Conclusion As an initiative to reduce medication expenditure, we proposed a three-month trial of the reabsorption of the manufacturing of antibiotic infusors from an external compounder. This required an additional 1.0 full time equivalent (FTE) Pharmacy Technician and purchase of a repeater pump. Preliminary analysis indicated that this would result in a significant cost saving.

Method To reabsorb the manufacturing of all antibiotic infusors from an external compounder to reduce site medication expenditure.

Method These changes were enacted rapidly to ensure the trial could commence prior to the end of Financial Year 2017/2018. Extensive liaison with Homelink, Centralised Intravenous
Workforce / practitioner development

Additive Service (CIVAS), dispensaries and the Pharmacy Business Unit were undertaken to determine the revised scope of work and associated business rules; changes to workflow; and metrics for analysis of the outcomes of the service change.

Results In the first month the percentage decrease in medication expenditure was approximately 25% of that expected; attributed to the pilot commencing in the last two weeks of the month, and low patient numbers. Subsequent months have demonstrated a decrease in medication expenditure as expected, representing a 0.36% reduction in the hospital's average total monthly medication expenditure. In addition, 97% of all new Homelink patients have had their length of stay reduced by 24 hours due to CIVAS's ability to undertake same day manufacturing. Workflow and staffing refinements continue to optimise this service.

Conclusion Reabsorption of antibiotic infusers has resulted in a reduction of medication expenditure for the hospital. This pilot has been extended.

Methods Working with the university and pharmacists across multiple departments we developed an audit tool for clozapine monitoring based on state and national guidelines. We then retrospectively audited the clozapine monitoring for clients at two community clinics (n = 61) over a calendar year. The first clinic had a pharmacist doing six-monthly medication reviews. The second clinic did not.

Results The clinic that did have a pharmacist had higher rates of compliance to key metabolic monitoring domains including testing of: fasting lipids (74% vs 27%), blood glucose (66% vs 23%) and electrocardiogram (33% vs 5%).

Conclusion Involvement of a trained hospital pharmacist in community-based clozapine clinics improves monitoring for metabolic adverse effects. Further research should focus on whether monitoring translates into improved preventative activity and physical patient outcomes (e.g. weight loss) and whether pharmacist reviews improve medication adherence to prescribed therapy.

FOLLOWING CLOZAPINE INTO THE COMMUNITY: REVIEW OF CLOZAPINE MONITORING IN COMMUNITY CLINICS

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Aim Treatment in the community is a core pillar of mental health policy, with models of care increasingly developed and delivered in this setting. Over the last two years we have engaged with psychiatrists, nurses and case managers to develop structured roles for hospital trained pharmacists within community mental health settings. One of these roles is within a clozapine clinic. Our aim was to assess outcomes of hospital pharmacist involvement in a community clozapine clinic.

Background Treating dental caries in cardiac paediatric patients is complex because of the risk infective endocarditis and use of anaesthetics. Medications with high sugar content may increase the risk of dental caries.

Aim To identify the cariogenic oral-liquid medications prescribed in the cardiac unit within a tertiary paediatric hospital to guide improvements in maintaining optimal oral health and reducing associated cardiac complications.

Methods A report on the usage of oral-liquid medications was obtained through the pharmacy dispensing software and ward impress list. The presence of cariogenic excipients in the top 50 most prescribed oral-liquid medications was identified, using the Therapeutic Goods Administration product information. Commercial manufacturers were consulted to determine the precise carbohydrate content and pH of individual preparations.

Results Of the 50 commonly prescribed oral-liquid medications, many contained varying concentration of either sucrose or glucose, some as high as 30% w/v. Cariogenic oral-liquid medication and alternative options were identified, which assisted in developing an accessible, user-friendly, electronic table information resource for prescribers and nursing staff to make appropriate medicine and dosage form choices. We observed that limited counselling is currently provided to caregivers on dental hygiene measures related to medication use. The literature was reviewed to develop anticipatory guidance on maintaining good oral health, such as rinsing the mouth after the administration of cariogenic medicines.

Conclusion Education and training of clinical staff and caregivers regarding cariogenic oral-liquid medications and good oral hygiene techniques may reduce the need for dental procedures and decrease the associated complications in cardiac patients.

THE EFFECT OF CHANGING THE MODEL OF SERVICE PROVISION ON CLINICAL PHARMACISTS

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Aim To report on the effects of changing a hospital pharmacists’ role from ward-based to medical unit aligned clinical pharmacy services.
Background In 2017 the pharmacy department of a large tertiary hospital changed the clinical pharmacy service from being ward based to aligning with medical units. This has enabled clinical pharmacists to be part of the interprofessional team. It has been demonstrated that unit-based clinical pharmacy services improves engagement with senior medical staff and increases the number of prospective interventions. It is also recognized that this type of service has limitations such as increased travel between wards leading to reduced time available for service delivery. Stress caused by these changes can affect the pharmacist physically, psychologically and behaviourally.

Methods SurveyMonkey® was utilised to obtain feedback from pharmacists part of clinical teams twelve months after establishing the new service model.

Results Responses were received from 23 pharmacists. Medical rounds were attended at least weekly by 34.7% (8/23) of pharmacists. Seven pharmacists hadn't joined a ward round due to lack of time. Outlier patients did not always receive the same care as inliers according to 26.1% (6/23) of pharmacists. Team leader support met or exceeded according to 18.2% (4/22) of responders, however there some individual variability of the team leaders. Workload increased to 18.2% (4/22) of pharmacists.

Conclusion Improving job control and providing support by being part of an interdisciplinary team can counteract the stress caused by increased demands.

Results A total of 34 medication charts (17 from each of pharmacist prescriber and medical officer) were reviewed. Medication charts written by a pharmacist were more accurate than those written by a medical officer, when compared to the medication history. Discrepancies and omissions had more potential for patient harm in the medical officer charts. A total of 146 orders prescribed by pharmacists, and 145 orders prescribed by medical officers were reviewed for safety. Of these, 90% of orders written by the pharmacist were error-free, compared to 26% orders written by medical officers.

Conclusion The incorporation of pharmacist prescribers into the admissions process has the potential to improve patient safety and decrease medication errors.

Aim To evaluate the medicines information (MI) rotation for resident pharmacists with respect to usefulness, competency, achievability and duration.

Methods The resident program was set up for a two-week (half day) rotation in MI.

Competencies in MI were developed and one drug consult for the year was required to be completed. Residents also gained experience in answering phone enquiries.

Results Three of the five residents responded and agreed or strongly agreed (A/SA) that: their overall experience in MI was useful, that their time spent in medicines information will be utilised in their everyday clinical practice, they gained a greater understanding of resources and how to do a literature search, most and least useful parts of their time in MI, achievability of the competencies during the rotation.

Conclusion The residents found the MI rotation was very useful to their clinical practice but the duration was too short
Multi-source feedback was also shown to assessed prior to feedback provision. Standards, known to the learner and self-be corrective rather than facilitating improvement in set competency assessment. These demonstrated an pharmacist feedback utilised tool-based frequently able to demonstrate a positive provided by pharmacists to doctors were learning. Feedback interventions i.e. between pharmacists, feedback goals were assessed for quality, and the 27 were included in the study. Articles were screened and assessed for eligibility and 1760 articles were between July 2017–2018. Our inclusion criteria focused on pharmacists' participation in the provision of feedback in hospital settings. 1760 articles were screened and assessed for eligibility and 27 were included in the study. Articles were assessed for quality, and the quantitative and qualitative findings were synthesised.

Results For intra-professional feedback i.e. between pharmacists, feedback goals centred on improving competence or performance whilst interprofessional interventions i.e. between pharmacists and prescribers focused largely on safety and quality, using variations of “audit and feedback” methods. Pharmacists were valued as feedback providers to medical staff, however, the feedback tended to be corrective rather than facilitating learning. Feedback interventions provided by pharmacists to doctors were frequently able to demonstrate a positive change in behaviour. Pharmacist to pharmacist feedback utilised tool-based assessment. These demonstrated an improvement in set competency standards, known to the learner and self-assessed prior to feedback provision. Multi-source feedback was also shown to increase pharmacist performance over time.

Conclusion The results suggest that verbal feedback from pharmacist to doctor was usually informal, opportunistic and corrective, with no time for preparation or self-evaluation. Interprofessional interventions were able to demonstrate an improvement in prescribing. Whereas intra-professional literature provides formal feedback, structured, scheduled and the learner knows that it is coming and can adequately prepare. This scoping review highlights the lack of learner-centred feedback provision in a busy interdisciplinary work-based learning setting.

Aim To explore feedback practices of pharmacists in hospital settings including inter- and intraprofessional engagement.

Methods Embase, CINAHL, Pubmed, Scopus and Psychinfo were searched between July 2017–2018. Our inclusion criteria focused on pharmacists' participation in the provision of feedback in hospital settings. 1760 articles were screened and assessed for eligibility and 27 were included in the study. Articles were assessed for quality, and the quantitative and qualitative findings were synthesised.

Results For intra-professional feedback i.e. between pharmacists, feedback goals centred on improving competence or performance whilst interprofessional interventions i.e. between pharmacists and prescribers focused largely on safety and quality, using variations of “audit and feedback” methods. Pharmacists were valued as feedback providers to medical staff, however, the feedback tended to be corrective rather than facilitating learning. Feedback interventions provided by pharmacists to doctors were frequently able to demonstrate a positive change in behaviour. Pharmacist to pharmacist feedback utilised tool-based assessment. These demonstrated an improvement in set competency standards, known to the learner and self-assessed prior to feedback provision. Multi-source feedback was also shown to increase pharmacist performance over time.

Conclusion The results suggest that verbal feedback from pharmacist to doctor was usually informal, opportunistic and corrective, with no time for preparation or self-evaluation. Interprofessional interventions were able to demonstrate an improvement in prescribing. Whereas intra-professional literature provides formal feedback, structured, scheduled and the learner knows that it is coming and can adequately prepare. This scoping review highlights the lack of learner-centred feedback provision in a busy interdisciplinary work-based learning setting.

Aim To describe benefits and efficiencies gained due to implementation of using the Calderdale framework at a large tertiary metropolitan public hospital.

Methods Daily operational data were collected using a data collection tool two weeks after implementation of this operational procedure. All data were collated using Redcap® and descriptive data analysed using MS Excel®.

Results Based on a sample size of 165 cases, over the two-week period in June 2018 the primary data shows a major proportion of the cases were related to solving antibiotic stewardship related problems (45%). Although the trained assistant was involved in resolution of all cases, 34% of them had to be escalated to the ward clinical pharmacists.

Conclusion Our data shows that with the trained assistant solving 66% of the cases, an estimated 28 hours per week of dispensary pharmacists' time was saved. A repeat audit at 12 weeks after implementation is planned.

Aim Evaluate and quality assure the experiential placements provided in 2016 and 2017 to enhance the achievement of placement goals, which is to provide comprehensive overview of paediatric medication management.

Methods Participant categories and placement durations were recorded. Participants completed an evaluation form at the end of their placements, and feedback with descriptive statistics and free-type comments were collected. The descriptive statistics were used to present quantitative data, and the free-type comments were used to identify common themes by thematic analysis.

Background Our institution provides routine tertiary paediatric experiential placements to undergraduate students, intern pharmacists working in adult hospitals and pharmacists caring for paediatric patients in non-metropolitan hospitals.

Aim To describe benefits and efficiencies gained due to implementation of using the Calderdale framework at a large tertiary metropolitan public hospital.

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Workforce / practitioner development

**Results** A total of 67 paediatric placements were provided with an average duration of 19.7 days (students), 4.7 days (interns) and 3.7 days (pharmacists). All respondents strongly agreed or agreed that the placement was valuable, relevant and practical; of suitable format; and improved their understanding of paediatrics. Common themes derived from the feedback included “clinical knowledge” and “learning style”. However, within these common themes, results varied according to the participants’ level of experience.

**Conclusion** The placements were perceived by participants as valuable and relevant. It is important to consider the learning styles and objectives for individual participants, in order to optimise the experience and practitioner development.

307 INTRODUCING THE PATIENT FLOW PHARMACIST

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**Aim** To evaluate the impact of a Patient Flow Pharmacist (PFP) on improving patient discharge times in four General Medicine units at a regional general hospital.

**Methods** The study was conducted over four weeks across four General Medicine units. The PFP’s duties included identifying patients for next day discharge via attendance at multidisciplinary patient flow ward rounds, prepopulating electronic discharge prescriptions for medical review and sign off and supporting unit-based clinical pharmacists to minimise pharmacy related discharge delays. Primary outcome measures included median discharges times plus the proportion of patients discharged prior to 10 a.m. and 12 p.m. (midday). Time required for each step in the clinical pharmacy discharge review process and data relating to patients who received PFP intervention and those who did not was collected. Medical and pharmacist satisfaction was evaluated via survey.

**Results** Baseline data (3 months prior to implementation) showed a median discharge time of 2.30 p.m. across the four units. The percentage of discharges prior to 10 a.m. was 4.3% and percentage prior to 12 p.m. was 18.3%. Following the 4-week pilot the median discharge time was reduced to 1.51 p.m. and the percentage of 10 a.m. and 12 p.m. discharges increased to 7% and 25.9% respectively. Staff survey demonstrated a high level of satisfaction with the service.

**Conclusion** The innovative PFP service has demonstrated positive change in discharge times, as well as unanimous acceptance of the service. An extended trial across multiple institutions will assist in fully assessing the impact of the service.
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