Something to 'CHIRP' about: Implementing real-time business intelligence in the era of electronic medication management

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Background

- Implementation of Electronic Medication Management (eMM) provides an invaluable opportunity to leverage prescribing, administration and clinical documentation activity captured within an eMM system for real-time analytics.
- Children's Health Queensland implemented eMM using Cerner Millennium® in April 2018 across inpatient, emergency and outpatient settings at Queensland Children's Hospital and in the hospital-at-home service.
- Maintaining capture of organisational performance, safety and quality measures was considered an essential component of the eMM implementation.

Aim

To design, implement and optimise real-time medication management analytics dashboards leveraging eMM data and evaluate their utilisation at a paediatric hospital.

Methods

Establishing the 'data lake'

In January 2018, the CHQ Business Intelligence team established a central 'data lake' housing data from a mirror of the statewide Integrated Electronic Medical Record (ieMR). Data is obtained from ieMR Production and stored in the 'lake' at 30-minute intervals, providing a near real-time feed while circumventing any impact to performance of the live production system. Refer to Figure 1.
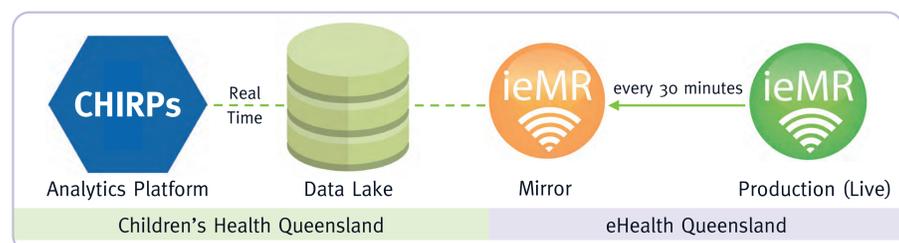

Figure 1. Schema of data flow and architecture.

Designing, building and evaluating **CHIRPs**

Between October 2017 and April 2018, the CHQ Business Intelligence and ieMR Advanced Project teams collaborated to design, build and validate a series of medication management analytics dashboards using the QlikSense® platform. Dashboard utilisation was evaluated using QlikSense® access metrics.
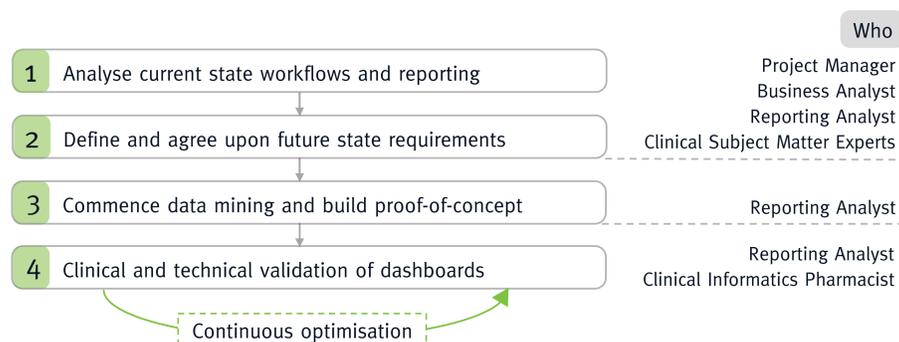

Figure 2. Summary of CHIRPs development process.

Results

A suite of 6 near real-time medication management analytics dashboards were implemented as part of the CHIRPs roll-out in April 2018, growing to 13 by the end of October 2018 with continuous optimisation work. Refer to Figure 3.

April 2018	– Medication orders audit	– Therapeutic Drug Monitoring
	– Positive Patient ID compliance	– Antimicrobial Stewardship
	– Medication orders requiring co-signature	– Pharmacy clinical interventions
October 2018	– Pharmacy documentation	– Medication administrations
	– Pharmacy documentation (historical)	– Controlled substances orders audit
	– Medication reconciliation (admission)	– Nurse witness audit
	– Pharmacy clinical review audit	

Figure 3. Summary of medication management analytics dashboards developed.

Examples of CHIRPs dashboards are displayed in Figures 4 and 5.

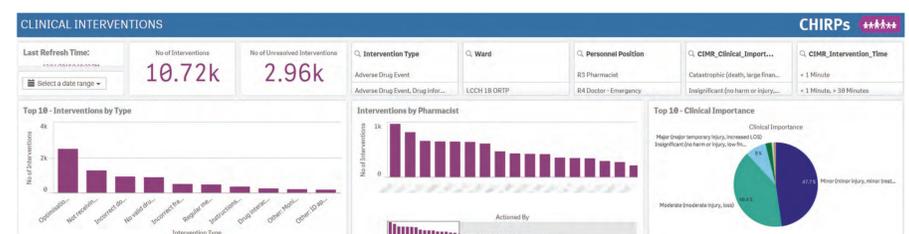**Figure 4.** Medication reconciliation on admission dashboard (excluding patient data).

Figure 5. Pharmacy clinical interventions dashboard (excluding patient data).

A summary of CHIRPs access metrics for select dashboards as a measure of business utilisation between April and October 2018 is presented in Figure 6.
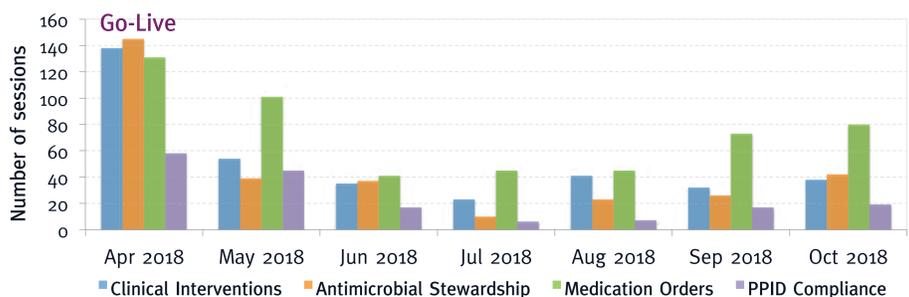

Figure 6. CHIRPs dashboard sessions launched between April and October 2018.

Conclusion

Real-time analytics dashboards introduce strategic capability to efficiently transform large volumes of data from eMM systems into meaningful information which is used frequently to assess performance, safety and quality retrospectively or to assist in managing patients in real-time.