

A MULTIDISCIPLINARY WHOLE SYSTEM APPROACH TO MEDICATION SAFETY IN NICU



K Thomson,¹ A Marshall,¹ HL Jeong,¹ P Martin,¹ E Sharma,¹ A McIntee,¹ A Pieterse,¹
R Broadbent,² L Edmonds,^{1,2} B Wefers,¹



¹Dunedin Hospital NICU Southern DHB, Dunedin, NZ; ²University of Otago, Dunedin, NZ

Introduction

Dunedin NICU is a 16 bed tertiary level unit with around 300 admissions per year. The NICU multidisciplinary medication safety team (MST) was formed in 2017 following a SAC 2 event which also involved a medication error. The subsequent review resulted in recommendations which included improvements in medication processes in the NICU. The medication safety team members include senior registered nurses, pharmacist, senior medical officers and an administrator.

Objectives

What we are trying to accomplish?

Recognising that neonates as a vulnerable population are at high risk of harm from medication errors we want to:

1. Develop clear guidelines and safety procedures for all NICU staff prescribing, dispensing and administering medication and provide resources which will promote medication safety
2. Foster the development of medicine safety as a core competency
3. Develop an open culture for the reporting and reviewing of medication errors.
4. Collect with data and trends on medication errors and identify areas for practice improvement.

How will we know that a change is an improvement?

Ongoing audit and review of all medication related incidents via the organisational electronic incident reporting system. Ensuring regular multidisciplinary feedback on the practice changes implemented.

What changes can we make that will result in improvement?

- Standardising monograph layouts for drug and infusion calculations, dilutions and handling of diluted drugs
- Referencing national/international neonatal guidelines and formularies where available and ensuring regular review dates for monographs
- Incorporating medication safety and equipment education in the orientation of all staff new to NICU
- Include medication safety in the annual NICU education programme and targeted study days

Interventions Achieved

Prescribing:

- Standardised drug monographs completed
- Electronic prescribing currently not available. Updated clearly written single chart advocated
- TPN, lipids and IV fluids charted at ward round
- Intubation drug monograph standardized for weights
- Pharmacist present on ward rounds to check medication charts and prescribing

Transcribing:

- Organisational quality programme module of Bedside Handover used to encourage medication chart check and confirm fluid and weight calculation of rates at time of each nursing handover.
- Operational procedures developed in consultation with laboratory introduced to ensure drug levels are processed in a timely manner to avoid delays in dose administration
- Laminated flow chart to accompany neonates who are in post natal requiring antibiotics to be administered in the NICU
- Pharmacist available on daily round

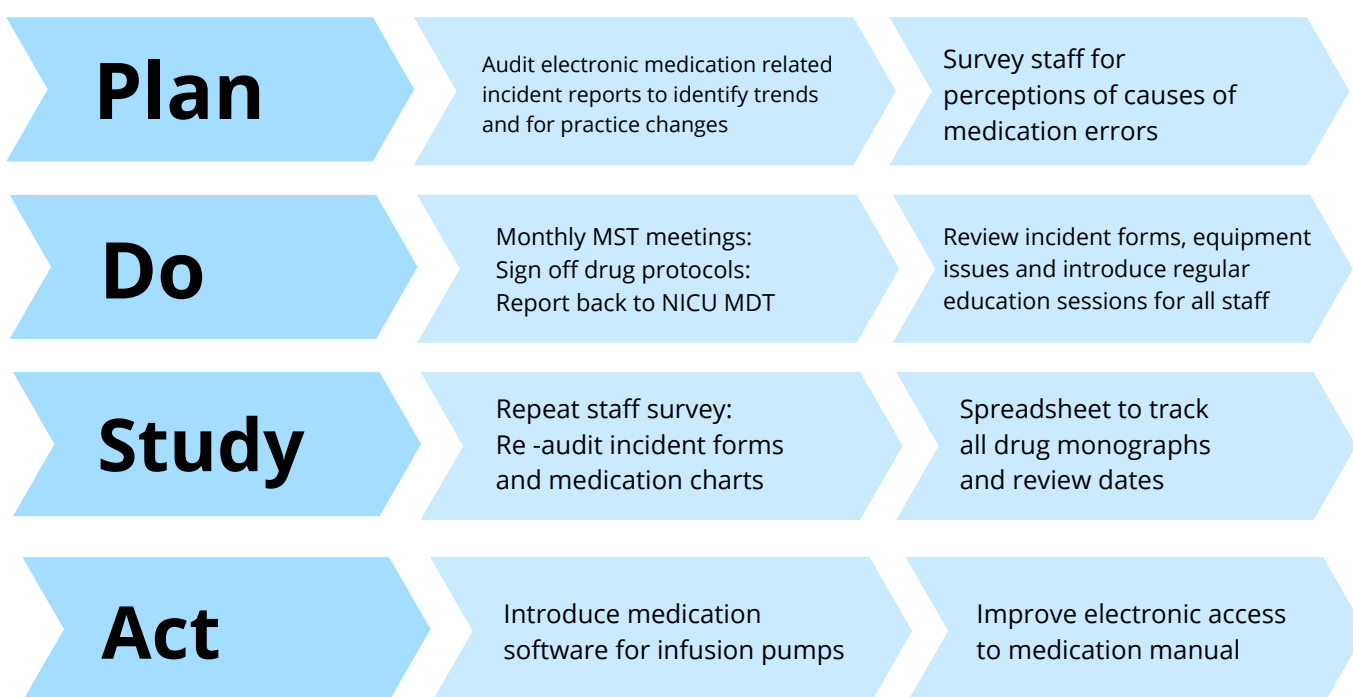
Administration:

- All reconstituted IV medication single use
- All drugs needing calculation require a double independent check
- IV medication safety software to be introduced for infusion pumps
- Change dose of stock medication where possible to avoid 2 step dilutions
- Use of laminated cards to identify staff who are checking, charting and administering medication

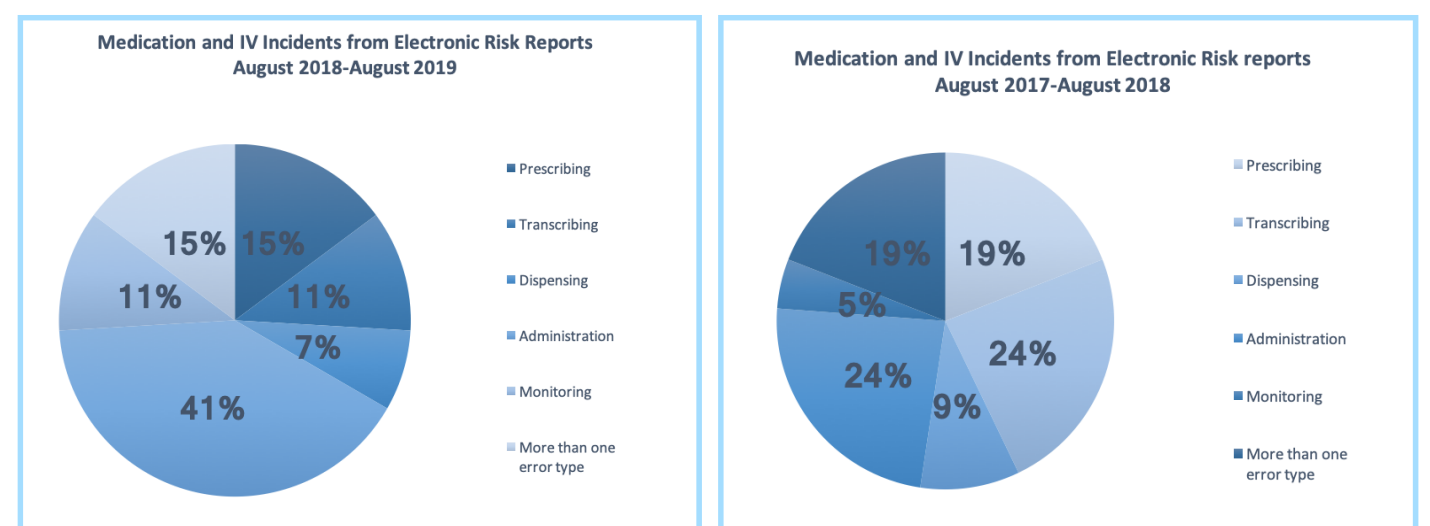
Knowledge and education:

- Audited incident reports and trend and themes are disseminated to staff
- Regular medication safety education for nursing and medical staff
- Staff survey themes disseminated

Methods



Organisational Electronic Incident Reports



Comparing Electronic Medication and IV related Risk Reports August 2017-18 and August 2018-19

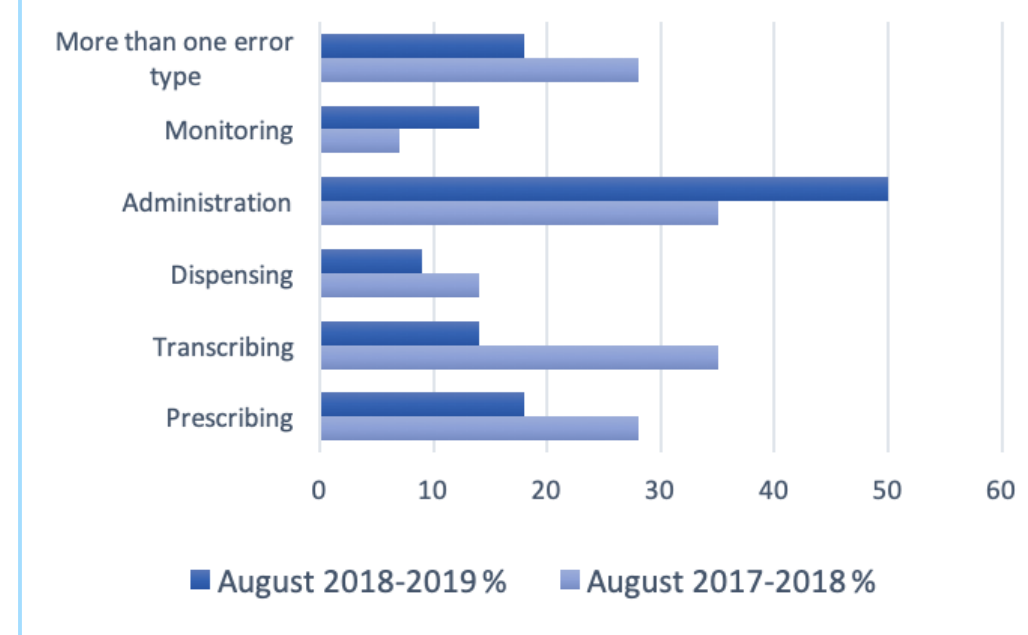


Table 1. Staff survey for perceptions of types and reasons for medication errors

Staff perceptions of medication errors August 2018	Staff perceptions of medication errors August 2019
Prescribing Incorrect dosing Charting not clear or legible TPN and routine infusions not re-charted daily Standing order medication not prescribed or signed off according to protocol	Prescribing Incorrect dosing regime Charting not clear Charting error Medications not charted
Transcribing Fluid calculations; eg titrating IV fluids to oral fluids Additional doses given due to drug charts not being signed Discrepancy in dilutions/formulation Incorrect dosing regime interpreted due to ambiguous charting intervals	Transcribing V fluids calculated incorrectly to prescribed rate Omission of doses Not double signed
Dispensing Unavailability of medication	Dispensing None identified
Administration Late administration Wrong time Wrong concentration Omitted doses TPN commenced without being charted Additional doses given due to not being signed as given	Administration Late administration Wrong time Wrong dose-calculation error Omitted doses Expired medication
Contributing factors: Night shift, distraction-interruptions; unit acuity-low (reactions dulled) and acuity high (busy); lack of staff to check; checking too quickly; forgetfulness; poor charting spaces - hard to read; Not understanding drug calculation; change in interval during treatment; delay in therapeutic drug level; unavailability of medication; not checking charts at handover,	Contributing factors: Fatigue; Distraction/interruption; Unit acuity; Busy workload affecting time management; staff shortage; not checking charts at handover; poor communication; unclear charting; frequent changes in medication management; delay in therapeutic drug level; no independent checking; confusion of double vs single signed medication; IV tissue

Future Recommendations

- Quarterly review of electronic incident reports
- Ongoing medication safety education at both the bedside and study days, tailored to staff feedback
- Annual staff survey of medical and nursing staff
- Education programme for staff prior to introduction of IV medication safety software
- Eventual introduction of electronic prescribing.
- Regular audit of medication charts