

Utilisation of Neonatal Medication Error Prevention Strategies: A Clinical Practice Survey of Australian and New Zealand Neonatal Units

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Background

- Medication errors are defined as any preventable event that may cause or lead to inappropriate medication use or patient harm and can occur during prescribing, transcribing, dispensing, administering, or monitoring of medications.¹
- Neonates are more prone to medication errors at each stage of the medicine management process due to the increased need for calculations, dilutions, and manipulations of medications, many of which are only available in adult formulations and concentrations.¹⁻³
- While there has been great focus on identification of factors contributing towards medication errors,^{1,5-6} there is a paucity of data evaluating the utilization of specific error-prevention strategies in Neonatal Units (NNU).

Aim

- The aim of this survey was to explore utilisation of various medication error prevention strategies in routine clinical practice across Australia and New Zealand NNUs.

Methods

- A survey was designed to evaluate utilisation of identified interventions across various clinical practice settings such as prescribing and evaluation of medication orders, obtaining and storing medications, and medication administration
- The survey was emailed to all member sites of the Australian and New Zealand Neonatal Network (ANZNN) between October 2016 and January 2017

Results

- Responses were received from 20 of 29 NNUs (response rate 69%), with the response rate similar across Australia and New Zealand (70% vs. 67%).
- A summary of the utilization of 16 aspects of clinical care considered important for improving medication safety in NNUs is provided in Figure 1. Previous systematic reviews have outlined a range of interventions which have been demonstrated to reduce the incidence of medication errors including electronic prescribing (e.g. electronic prescribing, standardised infusion concentrations, ward-based clinical pharmacy services, use of smart pumps for medication administration, smart pump medication administration library, and barcode medication administration system)⁶.
- The total number of medication error prevention strategies utilised in each NNU ranged from 2 to 10 (median = 7, Figure 2). There was no difference in the total number of medication error prevention strategies utilised between NNUs from Australia (7, range 2-10) compared with New Zealand (median 7, range 6-8; $p=0.847$) or between general hospitals (median 7, range 2-10) versus specialist maternity or paediatric hospitals (median 6.5, range 5-9; $p=0.583$)

Figure 1. Utilisation of Medication Error Prevention Strategies by Australian and New Zealand Neonatal Intensive Care Units

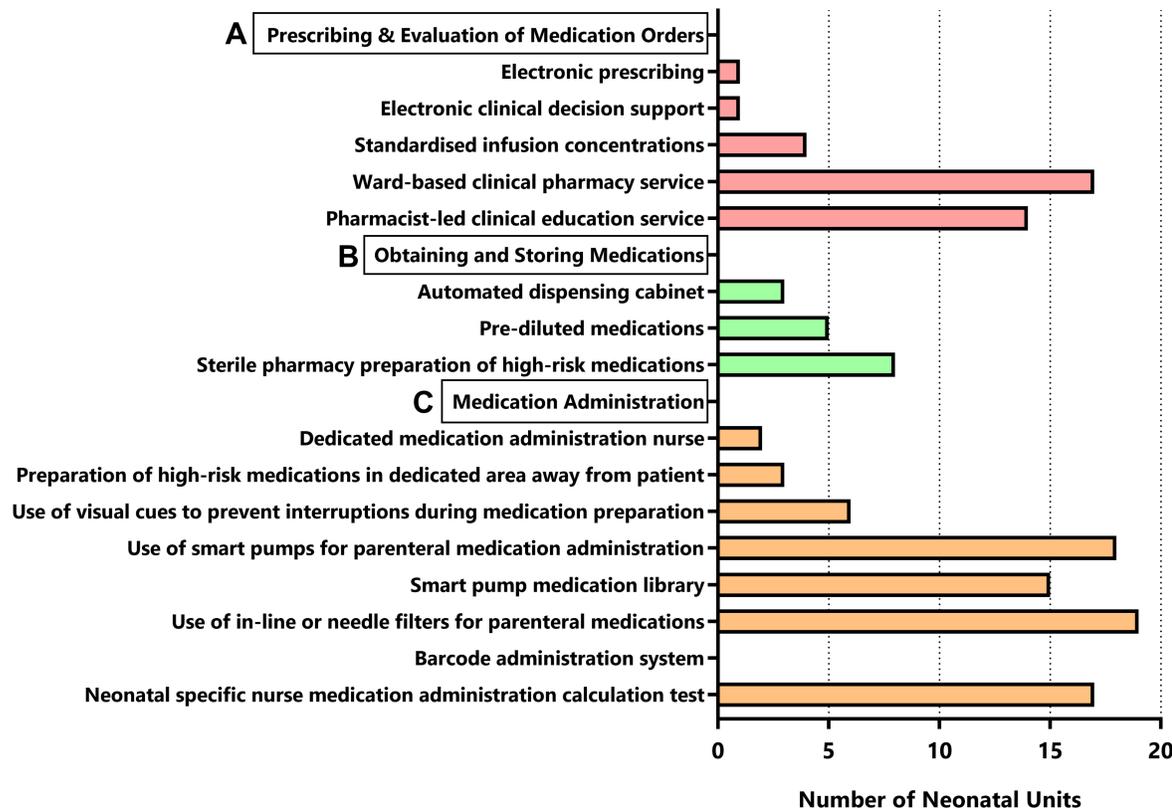
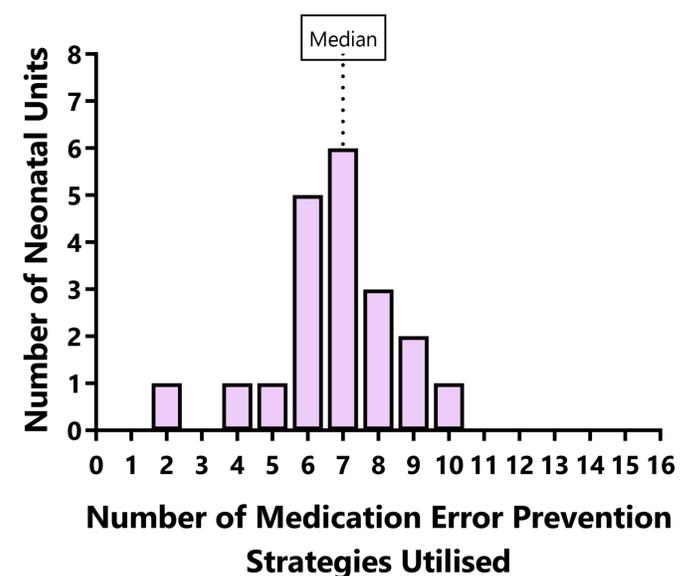


Figure 2. Histogram of Number of Medication Error Prevention Strategies Utilised by ANZ NNUs



Discussion

- Our clinical practice survey identified that medication error prevention strategies are poorly utilised across current practice settings.
- The financial burden associated with some strategies, particularly those that are technology focused (e.g. electronic prescribing, automated dispensing cabinets), may represent a significant barrier to their uptake and may explain their relatively low utilisation.
- These findings provide an important snapshot of current clinical practice and highlight many opportunities for NNUs to implement additional practices to reduce the risk of medication errors.
- Strengths: high response rate, good representation of hospitals located across Australia and New Zealand, likely generalisable to the Australian and New Zealand setting but not world wide.
- Limitations: utilisation of medication safety interventions was unable to be correlated with medication error incidence within each unit, this survey may not have captured all aspects which contribute towards medication safety.

Future Research Directions

- Further research should focus on exploring the key barriers to uptake of such strategies, while also expanding the strength of evidence pertaining to the effectiveness of various strategies (particularly their cost-effectiveness).
- Greater emphasis is also required on facilitating shared learnings from the implementation of such strategies, where they are being utilised, and evaluating the impact of such strategies on medication errors and patient safety.

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