

# Evaluation of neonatal medication safety initiatives across the continuum of care

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## Background

The Grantley Stable Neonatal Unit at the Royal Brisbane and Women's Hospital provides complex, multisystem care of critically ill neonates, including extremely premature neonates. This unit often accepts infants from regional hospitals that do not have the facilities to provide care for such critically unwell neonates. Extremely preterm neonates are at the highest risk for complications and adverse long-term outcomes.

Transfer of patients across institutions has been identified as a source for medication errors and discrepancies (1,2). Tertiary neonatal units regularly transfer patients to their local regional hospitals once stable for the remainder of their care until discharge.

The aim of this study was to investigate neonatal medication safety across the continuum at a quaternary hospital and develop, implement and evaluate initiatives for improvement.

## Method

This was a pre and post intervention study conducted over 12 months using the PDSA cycles, model for improvement frameworks and change management principles. All preterm and term neonates discharged and transferred to receiving hospitals were included in the study.

Data collected included:

- total number of infants transferred
- number of infants prescribed at least one medication at the time of transfer
- if medical and nursing discharge summaries were prepared
- number and type of medication discrepancies between medications prescribed and discharge summaries

The data collection form National QUM Indicator 5:3 was used to collect the following:

- Number of documented discharge summaries
- Number of documented discharge summaries with a list of medicines
- Number of discharge summaries that included medication therapy changes and explanations for changes
- Number of electronic discharge summaries including medications
- Number of medicines documented on the summary intended for continuation post discharge

## Interventions

A steering group was convened to evaluate data collected during the pre-intervention phase of the study. The steering group consisted of senior neonatal medical staff, clinical nurse consultant, neonatal nurses, neonatal nurse practitioners, neonatal discharge coordinators and neonatal pharmacists.

The steering group developed and implemented the following strategies to address gaps in medication safety identified from baseline data:

- Elimination of duplicated medication documentation.
- The nursing handover summary was re designed to reduce the duplication of medication information
- Provision to the receiving hospital of a copy of the most current inpatient medication chart, intravenous fluid chart and observation charts
- Training and education was provided to the neonatal medical staff about the errors found during Phase 1 of the study
- Pharmacist attendance on the SCN ward round weekly to increase engagement with staff about potential discharge and transfer facilitation.
- Change management principles were utilised to engage medical, nursing and allied health professionals to implement the changes.

## Results

In the pre-implementation phase, 139 patients were recruited to the study, over a 3 month period. Of these, 90 patients were transferred on at least 1 medication. 50 (55%) of these patients were found to have at least 1 medication discrepancy or error within the transfer documentation. Examples of errors included omission of dose and frequency for levetiracetam for seizure management on the medical discharge summary.

In the post-implementation phase, 132 patients were recruited to the study, over a 3 month period. Of these, 90 patients were transferred on at least 1 medication. 7 (8%) of these patients were found to have at least 1 medication discrepancy or error within the transfer documentation. By eliminating the transfer of information from the medication chart onto the nursing discharge summary, a large number of transcription errors and discrepancies were avoided.



Pre and Post data of the number of patients transferred on medications and associated errors

	Phase 1 Pre intervention	Phase 2 Post intervention
Patients	139	132
Patients prescribed medications	90 (65%)	90 (68%)
No of medication errors	50 (55.6%)	7 (8%)
Number of documented discharge summaries	139	132
Number of documented discharge summaries with a list of medicines	139	132
Number of electronic discharge summaries including medications	139	132

Pre and Post data of the breakdown of errors

	Phase 1 Pre intervention (n=50)	Phase 2 Post intervention (n=7)
<b>Errors on the discharge summary</b>		
Unintentional omission of a medication	18 (36%)	2 (28%)
Omitted frequency of a medication	11 (22%)	0
Omitted dose of a medication	11 (22%)	0
Incorrect dose of a medication	2 (4%)	3 (44%)
Incorrect frequency of a medication	5 (10%)	0
Unintentional continuation of a medication	4 (8%)	2 (28%)
<b>Errors in the nursing handover</b>		
Unintentional omission of a medication	6 (12%)	n/a
Omitted frequency of a medication	1 (2%)	n/a
Omitted dose of a medication	2 (4%)	n/a
Incorrect dose of a medication	1 (2%)	n/a
Incorrect frequency of a medication	5 (10%)	n/a
Unintentional continuation of a medication	2 (4%)	n/a
Omitted route of a medication	1 (2%)	n/a

## Conclusions

This study highlights the importance of a multidisciplinary approach to address medication safety across the continuum of care to achieve a successful outcome.

## References

1. Bates D (2007) Preventing medication errors: A summary. Am J Health-Syst Pharm—Vol 64 Jul 15, Suppl 9
2. Krzyzaniak N, Bajorek B (2016) Medication safety in neonatal care: a review of medication errors among neonates. Ther Adv Drug Saf. 2016 Jun;7(3):102-19

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