

Neonatal medicines

Clinical Guideline Presentation v1



45 minutes

Towards CPD Hours

References:

Queensland Clinical Guideline: Neonatal medicines is the primary reference for this package.

Recommended citation:

Queensland Clinical Guidelines. Neonatal medicines clinical guideline education presentation E19.54-1-V1-R24. Queensland Health. 2019.

Disclaimer:

This presentation is an implementation tool and should be used in conjunction with the published guideline. This information does not supersede or replace the guideline. Consult the guideline for further information and references.

Feedback and contact details:

M: GPO Box 48 Brisbane QLD 4001 | **E:** guidelines@health.qld.gov.au | **URL:** www.health.qld.gov.au/gcg

Funding:

Queensland Clinical Guidelines is supported by the Queensland Health, Healthcare Improvement Unit.

Copyright:

© State of Queensland (Queensland Health) 2019



This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives V4.0 International licence. In essence, you are free to copy and communicate the work in its current form for non-commercial purposes, as long as you attribute Queensland Clinical Guidelines, Queensland Health and abide by the licence terms. You may not alter or adapt the work in any way. To view a copy of this licence, visit <https://creativecommons.org/licenses/by-nc-nd/4.0/deed.en>

For further information, contact Queensland Clinical Guidelines, RBWH Post Office, Herston Qld 4029, email Guidelines@health.qld.gov.au, phone (07) 3131 6777. For permissions beyond the scope of this licence, contact: Intellectual Property Officer, Queensland Health, GPO Box 48, Brisbane Qld 4001, email ip_officer@health.qld.gov.au, phone (07) 3234 1479.

Images are property of State of Queensland (Queensland Health) unless otherwise cited.

Objectives

- Identify neonatal specific factors that can contribute to neonatal medication safety
- Identify strategies known to promote medication safety and or reduce errors



Medication errors

Classified in different ways

- By severity:
 - Degree of injury – ranging from nil to death
- Where in the medication process the error occurred:
 - Prescribing
 - Transcription
 - Dispensing
 - Administration
 - Monitoring



Common source of errors

- Calculation errors
- Incorrect expression of units of measurement (e.g. mg instead of g)
- Incorrect decimal point placement
- Incorrect neonatal weight recorded or used
- Incorrect dilution or preparation
- Incorrect pump settings
- Missed doses

Neonatal physiology

A student asks why the effects of medication errors are magnified in neonates?

What role does neonatal physiology have?

- Small size, large body surface area
- Immature pharmacokinetic processes (particularly in preterm)
- Liver and kidney immaturity affecting metabolism and excretion
- Altered stomach pH and emptying time influencing absorption
- High body water content and low protein concentration affecting drug distribution



Other contributing factors

The student comments that the risk of a neonatal medication error is reported to be 8 times that of any other population. He asks you why this is so?

What factors contribute to neonatal medication errors?

- High use of unlicensed or off label medicines with limited clinical/safety information
- Lack of standard preparations predisposing to over and under dosing
- Narrow therapeutic margins
- Identification of baby (babies look alike, multiple births with same surname, loss of ID bands)
- Potential for drug interaction with single lumen/difficult access

What system and human error factors might also contribute?

- Complex NICU/SCN environment
- Workload, staffing numbers/skill mix
- Inadequate communication/handover
- Lack of knowledge of procedures or specialised technology
- Human error
 - Fatigue
 - Haste
 - Training deficiencies



Medication safety

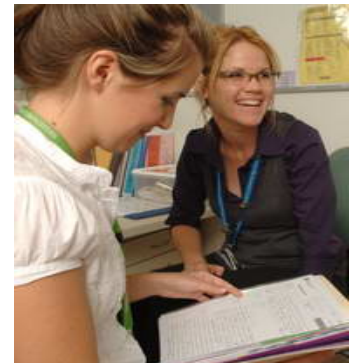
The student asks about strategies known to be effective in preventing or reducing medication errors

What can you say about effective strategies?

- No single strategy shown to be superior
- Combinations of interventions are required
- Effective strategies include:
 - Supporting staff
 - Standardising processes for prescribing, labelling, and administering medications
 - Improving communication between staff members and with parents

What types of strategies support staff?

- Promoting safety as more important than efficiency through modelling behaviours, no blame reporting
- Collaborative training/education on calculations, administration, pumps and medicine technology
- An emphasis on the importance of clinical judgement
- Clinical pharmacist available to support or advise

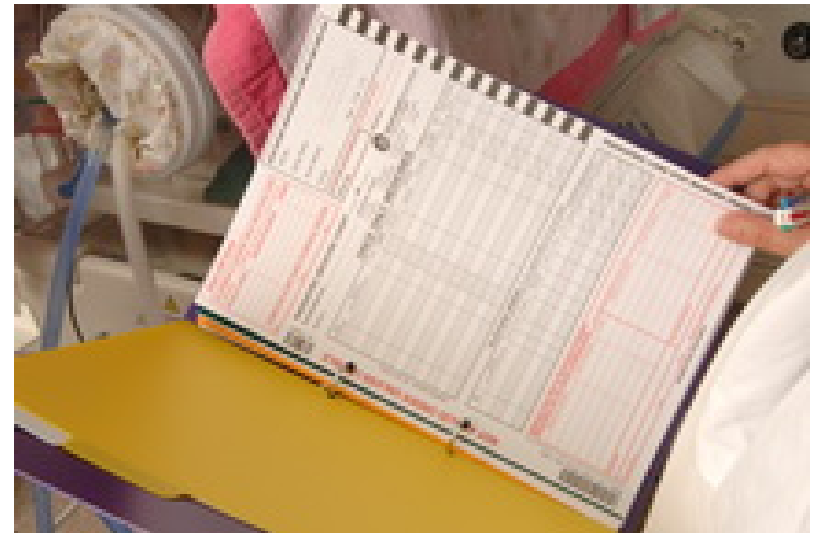


Medication safety

The student asks about the “6 rights of medication safety” sometimes also referred to as the “7 rights” of medication safety

What are the 6 (or 7) rights of medication safety?

- Right patient—check ID bands
- Right drug—check expiry date
- Right time—check frequency
- Right dose—double check all calculations and units
- Right route—only use common/approved abbreviations
- Right documentation
- Right to refuse—involve parents



Standardisation

You tell the student that standardisation of process can minimise the potential for medication errors.

What types of standardisation strategies reduce drug errors?

- Prescribe in standard doses, intervals and use standard abbreviations and terminology
- Use generic drug names (not brand names)
- Use one standard neonatal drug concentration
- Limit verbal orders to emergency situations
- Use the National Inpatient Medication Chart (or electronic version)

Units of measure (intended meaning)	Safe term/abbreviation
centimetre	cm
gram(s)	g
hour, minute	hour, minute
international unit(s)	unit(s)
kilogram	kg
litres	L
micrograms	microgram, MICROg, microg
microlitre	microlitre
micromol	micromol
milligram per litre	mg/L
milligrams	mg
millilitres	
millimole	
percentage	

Route of administration (intended meaning)	Safe term/abbreviation
buccal	buccal
ear or eye (specify left, right or each)	(right/ left/each) ear or eye
epidural	epidural
inhale, inhalation	inhale, inhalation
Intraarticular	intraarticular
intra dermal	intra dermal
intramuscular	IM
intranasal	intranasal
intraosseous	intraosseous
intraperitoneal	intraperitoneal
intrathecal	intrathecal
intravenous	IV
irrigation	irrigation
left	left
nasogastric	NG
nebulised	NEB
oral	PO
per rectum	PR

Labelling

The student asks about correct labelling of medications.

How can correct labelling contribute to medication safety?

- Identify medicines that look and sound alike
 - So they can be physically segregated and stored separately
 - Use Tall Man lettering to draw attention to similarities

What details should be included on an injectable label?

- Patient name, unique record number/identifier, date of birth
- Total amount of active ingredient (medicine name) including units (e.g. mg, microgram)
- Total volume of fluid in the container
- Concentration (units/mL)
- Diluent (if used)
- Date and time prepared/expires
- Signatures of both persons responsible for medicine preparation
- Route of administration

Medical devices

What strategies contribute to safe administration of neonatal medications?

- Administer infusions and medicines via a neonatal infusion device
- Calibrate and maintain equipment as per manufacturer instructions and specifications
- Use standard drug libraries for infusion devices where available
- Use oral/enteral syringes for oral medications

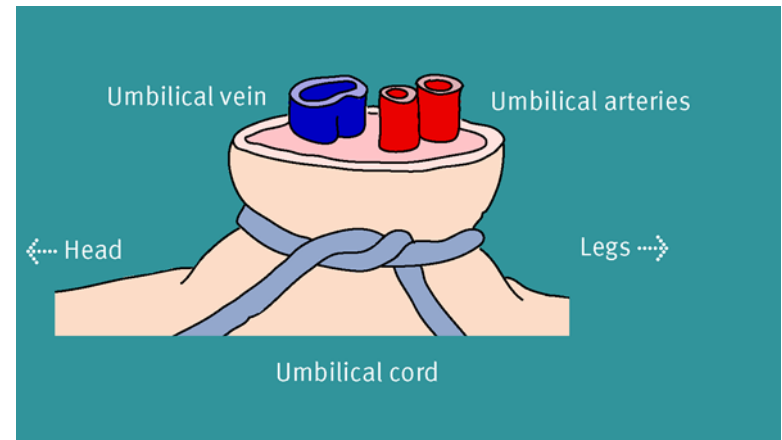


Parenteral access

The student asks if medications can be given via the umbilical artery catheter (UAC)

What can you say about administration of medication via UAC?

- Limited evidence for specific medication administration via UAC
- Do not administer vasoactive agents or hypertonic or hypotonic solutions via UAC
- Limit administration to situations where benefit outweighs risk (e.g. emergency situations, no other access available)



Parenteral nutrition (PN)

Should medication be co-infused with parental nutrition?

- Avoid where possible
- Limited evidence for specific PN preparations
- Seek advice from pharmacist
- If unavoidable:
 - Flush IV line before and after
 - Infuse medicine via filter
 - Consider impact of interruption to PN on total fluids, nutritional requirements

