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Queensland Clinical Guidelines

Translating evidence into best clinical practice

Maternity and Neonatal **Clinical Guideline**

Neonatal medicines

Queensland Government

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Cultural acknowledgement

We acknowledge the Traditional Custodians of the land on which we work and pay our respect to the Aboriginal and Torres Strait Islander elders past, present and emerging.

Disclaimer

This guideline is intended as a guide and provided for information purposes only. The information has been prepared using a multidisciplinary approach with reference to the best information and evidence available at the time of preparation. No assurance is given that the information is entirely complete, current, or accurate in every respect.

The guideline is not a substitute for clinical judgement, knowledge and expertise, or medical advice. Variation from the guideline, taking into account individual circumstances, may be appropriate.

This guideline does not address all elements of standard practice and accepts that individual clinicians are responsible for:

- Providing care within the context of locally available resources, expertise, and scope of practice
- Supporting consumer rights and informed decision making, including the right to decline intervention or ongoing management
- Advising consumers of their choices in an environment that is culturally appropriate and which enables comfortable and confidential discussion. This includes the use of interpreter services where necessary
- Ensuring informed consent is obtained prior to delivering care
- Meeting all legislative requirements and professional standards
- Applying standard precautions, and additional precautions as necessary, when delivering care
- Documenting all care in accordance with mandatory and local requirements

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Abbreviations

IM	Intramuscular
IV	Intravenous
NICU	Neonatal intensive care unit
SCN	Special care nursery

Definitions

Term	Definition
Medication error	A preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional.[1] Error can occur at any stage in the medication-use process such as prescribing, transcribing, dispensing, administering or monitoring of medications.[2]
Off label	The use of a medication in a patient group at a dose, frequency or through a specific administration route that is not approved and is considered to be beyond the terms of the product licence.[2]
Unlicensed	The prescribing of medications for indications that are not in the approved product information.[2]
Double-check	A procedure in which two individuals, preferably two registered practitioners, separately check each component of the work process. Example: one person calculating a medication dose for a specific patient and a second individual independently performing the same calculation (not just verifying the calculation) and matching the results. This would involve checking the accuracy of the dose/kg and the weight being used in the calculation.[3]
Near miss	An error that took place but was captured before reaching the patient. Example, penicillin was ordered for a patient allergic to the drug; however, the pharmacist was alerted to the allergy during computer order entry, the prescriber was called, and the penicillin was not dispensed or administered to the patient. Or the wrong drug was dispensed by pharmacy, and a nurse identified the error before it was administered to the patient.[3]
Medication device	Equipment such as infusion pumps, implantable pumps, syringes, pen devices that contain medication (e.g., adrenaline, insulin), tubing, patient-controlled analgesia pumps, automated compounding devices, robotics, and other related devices that are used for medication preparation, dispensing, and/or administration.[3]

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1 Introduction

This clinical guideline has been developed for use by Queensland clinicians who manage (prescribe, transcribe, dispense, administer and monitor) neonatal medicines. It is an adjunct to and is to be read in conjunction with the individual neonatal medicine monograph published by Queensland Clinical Guidelines.

1.1 Purpose

The goal of developing standard neonatal medicine monographs is to:

- Decrease neonatal medication errors
- Stimulate the development of a statewide collaborative approach to procedures, safeguards and strategies for the management of neonatal medicines

2 Medication errors

Medication errors are one of the most common and preventable adverse events in healthcare settings. Children and babies are more prone to medication errors and are more vulnerable to harm from the effect of medications errors than adults.[4] The risk of a neonate sustaining a medication error is reported to be eight times higher than any other population.[5]

2.1 Types of errors

Medication errors have been classified in a number of different ways, including by severity, on the basis of their cause or according to their timing in the medication-use process.[5]

Table 1. Classifications of medication errors

Aspect	Consideration
Severity	• Classified by degree of injury to the patient • Ranges from no injury to mortality
Medication management[5]	• Errors occurring during the phases of the medication management processes of: o Prescribing o Transcription o Dispensing o Administration o Monitoring
Common neonatal errors[5]	• Dose calculation error (most frequent) • Incorrect expression of the measurement unit (e.g. milligrams instead of grams) • Wrong decimal point placement (e.g. 10-fold higher dose) • Wrong neonatal weight recorded • Mistake in administration rate, route or timing • Incorrect dilutions • Wrong settings on infusion pumps • Missed doses

2.2 Contributing factors

Medication error is multi-factorial and often more than one contributing factor is present.

Table 2. Factors contributing to medication errors

Aspect	Consideration
Neonatal physiology[5]	• Effect of a medication error is magnified in neonates due to: o Small size, rapid changes in weight and body surface area o Immature pharmacokinetic processes particularly in the preterm o Liver and kidney immaturity leading to reduced drug metabolism and excretion o Differences in pH and in emptying time of the stomach that may influence absorption o High body water content and low serum protein concentration that may affect drug distribution
Neonatal population[5]	• Potential for drug interactions when medications are administered through a single-lumen • Reported that the number of medications administered in the Neonatal Intensive Care Unit (NICU) is inversely proportional to the gestational age or weight • Longer hospitalisation • Need for accurate and appropriate delivery systems (pumps)
Lack of neonatal-specific medications[5,6]	• Limited information about pharmacokinetics, dosing, clinical use, efficacy and safety of many medicines • High use of unlicensed or off label medicines • Lack of standard preparations for neonates and the need to prepare and calculate individualised doses o Predisposing to 10 to 100-fold potential overdose • Narrow therapeutic margins
Neonatal system factors[5]	• Complexity of NICU and Special Care Nursery (SCN) systems and environment related to o Workload o Staffing numbers/skill mix o Inadequate handover communication o Inappropriate use of technology o Poor knowledge of procedures
Health care provider[5]	• Human error can be related to: o Fatigue o Inattention/distraction o Haste o Inexperience o Inadequate training
Neonatal identification[5,6]	• Similar appearance of neonates in the first days of life making them less distinguishable from each other • Multiple births with identical surnames • Inability of the neonate to take part in the identification process • Loss or removal of identification bands that are often difficult to secure due to fragile skin and small wrist/ankle sizes

3 Medication safety

There is limited high level evidence comparing the effectiveness of strategies aimed at preventing and/or reducing medication errors in hospital.[2,7,8] Although multiple strategies have been identified no single intervention has been shown to be clearly superior. Therefore, combinations of interventions targeting multiple aspects of the medication management process are most likely required to effect a reduction in medication errors.[2]

3.1 Staff support

Table 3. Staff support

Aspect	Consideration
Culture of safety[6]	• Promote patient safety as more important than efficiency and productivity • Individually model desirable behaviours to influence commitment to safety • Involve all health care providers in risk management strategies that aim to reduce medication errors • Support a culture of non-punitive reporting
Training and education[6,8]	• Incorporate collaborative training that aims to improve communication competence between healthcare providers • Provide training on medication administration and the opportunity to practice mathematical calculations for drug dosage • Undertake baseline and annual competency evaluation of knowledge and skills related to medication dosing and safe practices[6] • Incorporate education with the introduction of new technology[2] (e.g. clinical decision support systems, new pumps and infusion devices, automated dispensing)
Clinical judgement	• Use clinical judgement and review all aspects of the monograph before use • Seek advice from relevant clinician/service (e.g. medical specialist, clinical pharmacist, pharmacy department, product information or medicines information service) as required • Only administer medications that are within current scope of practice • Refer to the disclaimer in this document
Clinical pharmacist	• Support the full-time presence of a dedicated clinical pharmacist in a NICU • Support access to clinical pharmacist/pharmacy services in SCN and other maternity and neonatal nursery settings o Demonstrated to significantly decrease serious medication errors in intensive care settings[5-7]

3.2 Medication management

Adhere to Standard 4 (Medication Safety) of the National Quality and Safety Standards[9]

Table 4. Medication management

Aspect	Consideration
6 rights of medication safety	• Practice the rights of medication safety[10] to minimise errors o Right patient o Right drug—check expiry date o Right time—check frequency o Right dose—double check all calculations and units o Right route—only use common abbreviations o Right to refuse—involve parents
Prescribing principles[4]	• Include the following on the prescription/medication chart: o Gestation at birth o Date of birth o Current body weight o Basis for the dose calculation • Prescribe practical doses for easy measurement and administration • Prescribe dose in units of mass (e.g. 150 mg per dose) where appropriate • Follow general principle of drug prescribing o Name of medicine (generic), route, dose, frequency, duration • Use standard prescribing intervals and terminology o Refer to Appendix A: Standard medication terms and abbreviations o Refer to Appendix B: Routes of administration and dose forms • Limit verbal (face to face and telephone orders) to medical emergency situations[6]
Standardisation[6]	• When possible, establish one standard neonatal drug concentration for each injectable and oral medication used o Reduces risk of medication errors when transferring between one facility and another o Can stimulate demand for manufactures to offer commercially prepared standard solutions
Storage of medicines	• Store medicines as per specific requirements for each medication as noted in the relevant neonatal medicine monograph

3.3 Communication

Table 5. Communication

Aspect	Consideration
Documentation	• Medication chart o Use the National Inpatient Medication Chart (age appropriate) to enable the safe and accurate communication of the prescription for dispensing and administration[11] o Complete all sections required • At discharge document in the health record: o Name of drug o Indication for use o Route of administration o Instructions how to administer o Steps to follow if adverse drug reaction or accidental overdose is suspected
Standard terminology[12]	• Use only approved terminology, abbreviations and symbols in all medicine communication • Use generic medicine names (active ingredient or approved name) o Do not use brand names • Write chemical names in full (e.g. write potassium chloride not KCl) • Use 24-hour time for time of day administration (e.g. 1800 not 6 pm) • Avoid fractions • Use words to express numbers of 1,000 or more (e.g. one thousand not 1,000) • Use words or Hindu-Arabic numbers (e.g. one, two, three or 1, 2, 3) not Roman numerals (e.g. I, II, III) • Use metric units not imperial or other measurements (e.g. teaspoon) • Use leading zeros for a dose less than one (e.g. 0.1 mg not .1 mg) • Do not use trailing zeros, (e.g. 1 mg not 1.0 mg) • Do not follow abbreviations such as mg or mL with a decimal point or full stop (e.g. mg not mg.) • Refer to Appendix A: Standard medication terms and abbreviations
Double checking[13]	• Has been advocated as an important strategy to prevent medication errors • Limited evidence about the effectiveness of the procedure due to the variability in definitions and inconsistencies in application • When performed independently by two people and carried out selectively (in high risk patient populations, situations and with high alert medications) has been shown to reduce medication errors • Include in local medicine administration protocols, the requirement to” o Double check patient identification o Route of administration o Time to be administered o Medicine calculations o Duration of administration o Double signing of medication charts o Observe the administration of the medication • Possible approaches to double checking include: o Independent: Nurse 1 and 2 calculate the drug separately o Watching: Nurse 2 watches Nurse 1 do the calculation o Do and show: Nurse 1 shows Nurse 2 the calculation and Nurse 2 checks that it is correct o Together: Nurse 1 and 2 perform the calculation and confirm verbally
Event reporting	• Adhere to local protocols for adverse event reporting • Regularly review the types or medication errors to identify weaknesses in the system and patterns of errors
Printed copies of monographs	• Destroy printed Queensland Clinical Guideline neonatal medicine monographs immediately after use o The most current and therefore the only correct version of each monograph is maintained on the Queensland Clinical Guidelines website

3.4 Labelling

Table 6. Labelling

Aspect	Consideration
Principles[6]	• Medicine products that have similar or confusing manufacturer labelling or packaging have the potential to cause error o Establish a list of look and/or sound alike products o Physically segregate in all storage areas products with look-alike names and packaging o Use tall man lettering, mixed case lettering to draw attention to similarities in words (e.g. fentaNYL versus SUFentanil)[14] • Label all containers (e.g. bags or syringes) containing medicines that leave the hands of the person preparing the medicine[15]
Injectables[15]	• Prepare and label each injectable medicine drawn up, as a single operation by the same person • Include on the label o Patient name, unique record number/identifier, date of birth o Total amount of active ingredient (medicine name) including units (e.g. mg, microgram) o Total volume of fluid in the container o Concentration (units/mL) o Diluent (if used) o Date and time prepared o Date and time of expiry o Signatures of both persons responsible for medicine preparation o Route of administration
Administration lines[16]	• Label the distal end of lines and catheters (including extension lines and giving sets used to deliver fluids and or medications) • Use pre-printed medicines line labels for commonly used medications • Use generic medicine label when a pre-printed label is unavailable • Include the route, date and time the line was commenced on the label

3.5 Consumables and medical devices

Table 7. Consumables and medical devices

Aspect	Consideration
Infusion devices	• Administer all intravenous infusions (medicines and fluids) via an appropriate neonatal infusion device • Calibrate and maintain equipment used in the administration of neonatal medicines according to manufacturer's instructions and local protocols (including electrical safety checks) • Use a standard neonatal drug library (where available)
Oral syringes[6,15]	• Use specially designed oral syringes (enteral syringes) that cannot connect to parenteral tubing for the administration of oral fluids and enteral nutrition
Infection control	• Follow standard infection control procedures for administration of medications, including: o Hand hygiene o Cleaning areas used in medicine preparation o Sterile techniques for administration of medicines via central lines and/or with total parenteral nutrition (TPN) o Single vial access or single patient access following local procedures and individual product recommendation o Single use consumables o Cleaning of infusion devices
Other technologies	• May have potential to reduce medication errors: o Barcode medication administration systems[17] o Electronic medication management systems reported to support the national strategy for Quality Use of Medicines[18] • Follow local protocols for use

3.6 Consumer education

Table 8. Consumer education

Aspect	Consideration
Consumer information	• Provide parents with consumer information about the medicines prescribed for their baby[9]
Discharge planning[6]	• Commence discharge education about medications prior to the day of discharge • Provide information verbally and in written form • Ascertain understanding with return demonstrations of medication preparation and administration • Use language designed for grade six to eight reading level • Use an interpreter as required • For each medication include: o Name of drug o Indication for use o Route of administration o Instructions how to administer o Steps to follow if adverse drug reaction or accidental overdose is suspected

3.7 Legislation and policy

Table 9. Legislation and policy

Aspect	Consideration
Legislation	• Follow state and federal legislative requirements related to medication management including (but not limited to): o Health (Drugs and Poisons) Regulation 1996[19] o Therapeutic Goods Act 1989[20] o Health Act 1937[21]
Queensland Health policy	• Follow Queensland Health medication management policy including (but not limited to): o List of Approved Medicines (LAM)[22]
Local protocols	• Follow local policy/procedure for medication administration for: o Standing orders o Accepted variations from the monographs o According to scope of practice requirements

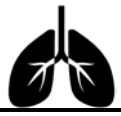
4 Monograph content

The content has been extensively reviewed by clinicians. This does not replace the need for clinical judgement and scrutiny of each individual medication administration event.

4.1 Routes of administration

Routes of administration are colour coded and icons are used to help differentiate dosing and preparation requirements, and clearly indicate the route of administration. The colours of each route align with the National Standards for colour coding.[15]

Table 10. Routes of administration

Route	Icon	Comments
Oral		• Unless otherwise specified, feeds and medications may be administered orally or via a nasogastric or orogastric tube in accordance with local protocols
Intravenous (IV)		• Unless otherwise specified, medications may be administered IV via a peripheral venous line (PVL), central venous line (CVL) or umbilical venous line (UVL)
IV or umbilical artery catheter (UAC)		• Indicates an IV medicine that may also be administered via a UAC if necessary (e.g. due to limited IV access) • Refer to Table 14. Principles of access management
Peripheral intra-arterial line (P-IAL)		• Only heparinised saline may be administered via a peripheral intra-arterial line • NEVER inject other medications via a peripheral intra-arterial line
Intramuscular (IM)		• Follow local protocols for IM administration • Inject into thickest part of the vastus lateralis in the anterolateral thigh (maximum 0.5 mL per site)[23] • Rotate administration sites
Subcutaneous (subcut)		• Follow local protocols for subcutaneous administration • Use a 25G subcutaneous needle unless otherwise specified or indicated by clinical circumstances
Inhalation		• Includes medicines administered via nebuliser or other respiratory delivery mechanism (e.g. surfactant)
Ophthalmic		• Follow local protocols and standard infection control measures during the administration of ophthalmic medications
Topical		• Unless otherwise specified, use minimum amount required to achieve coverage
Nasal		• Follow local protocols for administration via the nasal route • After administration inside the nostril, press sides of nostrils together to spread ointment
Otic		• Follow local protocols for administration into the ear
Rectal		• Follow local protocols for administration via the rectal route

Stoma		• Seek expert guidance before administration of medicines via a stoma
Buccal		• Indicates medications that are to be absorbed through the mucus membranes of the mouth (not via orogastric/nasogastric or suck feed) • Follow local procedures for administration via the buccal route
Intraosseous		• Indicates medications that are to be administered intraosseous via intraosseous needle or device • Follow local procedures for administration via the intraosseous route

4.2 Fields within the monographs

Table 11. Fields within the monograph

Term	Defined (for neonatal monographs)
Title	• Generic medicine name o Brand names are not used • Nomenclature as per Australian Medicines Handbook
Presentation	• Describes the standard form in which the medication is available for use (e.g. ampoule, vial, tablet) • Oral solution o Term used to include elixir, suspension or other liquid medicine preparation intended for administration via the oral route • A compounded preparation from Queensland Health central pharmacy or Mater Brisbane Pharmacy is indicated if it is available • Refer to Appendix B: Routes of administration and dose forms
Indication	• The clinical indication(s) for use
Dosage	• Where required, dosages are specified by gestational age, days of age, weight (kg) or other criteria as appropriate
Preparation	• Includes example instructions for reconstitution, dilution or preparation of the medicine • Formulated to accommodate a range of factors including, solution and drug pH, simplified calculation, safe, clear and consistent language • Other preparation may be appropriate in individual circumstances
Administration	• Specific instruction for administration (e.g. duration of administration, relationship of administration to feed or procedure, use of delivery device)
Special consideration	• Information not presented elsewhere in the monograph. May include (but not limited to): o Contraindications/cautions o Duration of therapy o Properties of the medicine o Additional dosage or administration considerations
Monitoring	• Includes aspects of clinical monitoring relevant to the medication only • Does not replace usual or routine neonatal clinical surveillance or clinical judgement in individual circumstances
Compatibility	• Medicines for which there are no known interactions, and which may be administered together
Stability	• Includes storage and disposal of medicine before and after opening or reconstitution or preparation • Unless otherwise specified in the monograph, change infusion lines at a frequency specified in local protocols
Side effects	• Includes those relevant or assessable in the neonate • Where feasible, grouped according to body system and blood pathology • Hypersensitivity reactions are rare in neonates
Actions	• Defines the basic mechanism of action of the medicine in the body • Refer to a product information for detailed information

4.2.1 Incompatibility and interaction

Table 12. Incompatibility and interaction

Aspect	Consideration
Definitions	• Incompatibility: o An undesirable reaction that occurs between the drug and solution, container or another drug • Drug interaction: o Describes the alteration of a drug effect due to the influence of another substance (i.e. drug, chemical substance, nutrition) resulting in a solution that is no longer optimal for the patient after the substances are mixed
Causes	• Can occur between: o Drugs and inappropriate IV solutions as diluent o Two drugs (drug-drug incompatibility) when they are: ▪ Mixed together within the same infusion line and/or IV container ▪ Administered one after the other, but within the same infusion line o Drugs and adjuvants (preservative, buffer, stabiliser, solvent o Drugs and materials used in IV containers or medical devices
Prevention strategies	• Review incompatibility and interaction information • Assess and plan regimes to avoid mixing of drugs which must be administered separately • Separate drug doses by time and place (e.g. flush before and after with 0.9% normal saline, separate administration by 1 hour) • Consistently check alternative modes of administration and/or use multi-lumen catheters

4.3 Standard age terms

Standardise terminology when defining age of baby.

Table 13. Terminology of age

Term (age)	Defined (for neonatal monographs)
Gestational age	• Time elapsed between the first day of the last menstrual period and the day of birth • Often determined by the best obstetric estimate and/or postnatal physical examination of the baby
Chronological age	• Also referred to as days of life • Time elapsed from birth
Post-menstrual age	• Gestational age plus chronological age • Usually used in the perinatal period beginning after the day of birth
Corrected age	• Chronological age less number of weeks born premature • Usually used after the perinatal period for children up to 3 years of age who were born preterm

4.4 Parenteral access management

Intravenous access is a complex and often problematic issue for neonates. Balancing the risks and benefits of multiple and sometimes concurrent medication and fluid administration in the neonate with limited or insufficient IV access requires significant expertise.

Table 14. Principles of access management

Aspect	Recommendation
Route of administration	• When both are appropriate and feasible o Choose IV over IM administration o Choose IV over UAC administration • Seek expert advice from a neonatologist/paediatrician before UAC use
UAC access	• Very limited evidence or expert consensus about the safety of individual medications administered via UAC[24-28] • Limit UAC administration to cases where benefit outweighs risk (e.g. no other access available, emergency situation)[24] • Do not administer vasoactive agents (e.g. dopamine, dobutamine adrenaline), hypertonic or hypotonic solutions or hyperosmolar solutions via UAC[24-26] • Where specified in the monograph, UAC administration is based on the consensus opinion of the working party and or clinical leads • Discuss with neonatologist/paediatrician prior to use
Routine IV care	• Flush the IV access before and after administration of medicines o Do not flush the active medication through by changing the maintenance infusion rate o When determining volume of flush consider fluid requirements of baby, length of infusion line needing to be cleared and individual circumstances • Give IV medications separately • Do not administer or connect into a line containing blood or blood products • Monitor all IV sites for extravasation and local site reactions • Change IV administration sets and fluids in accordance with: o Local protocols o Medicine stability requirements specified in individual monographs • If no local protocols for frequency of changing IV administration sets and fluids o Change at least every 96 hours (4 days)
Filters	• Use IV filters in accordance with o Local protocols o Specific medicine requirements • If no local protocol, use a 0.2 micron (µm) Pall filter on all IV infusions if o Less than or equal to 1500 g or o Baby (any weight) has CVL in situ
Co-infusion with parental nutrition	• Avoid co-infusion (same IV access line or port) with PN o Limited evidence about safety • If unavoidable o Seek expert pharmacological advice to inform decision-making o Turn off PN and flush the line prior to infusion and prior to recommencing PN (i.e. before and after medication administration) o Infuse the medicine via a filter o Consider the impact of temporarily ceasing PN on total daily fluid and nutrition requirements

4.5 Evidence base

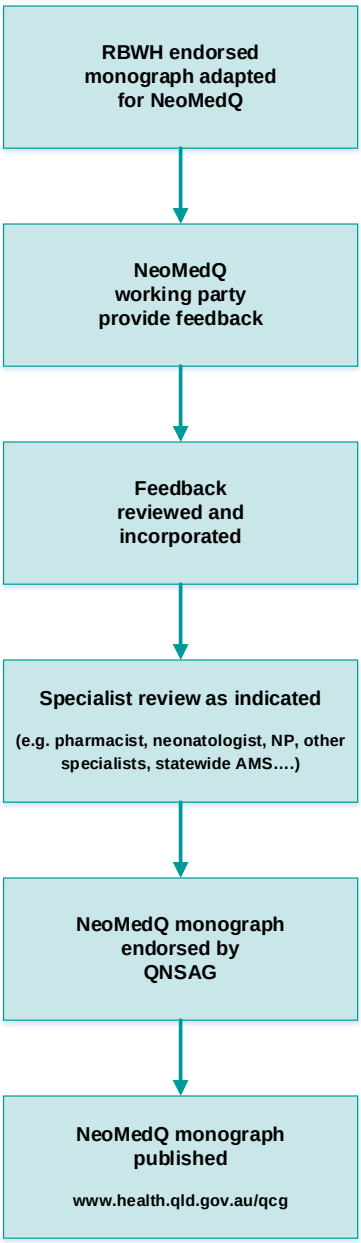
There is limited high level evidence about the use of neonatal medicines. Refer to Table 2. Factors contributing . It is common to find variations between reputable reference sources for dosages, administration techniques compatibilities/incompatibilities and side effects. It is also common to find widely varying practices and opinions among neonatal clinicians.

4.5.1 Overarching principles

Information in the NeoMedQ monographs:

- Preferentially references:
  - Primary sources of recognised reliability/accuracy
  - Neonatal specific content
  - Current information (date of development/most recent review can be identified)
  - Practices consistent with expert Queensland clinician opinion
- Is presented in a manner that enables identification of areas of uncertainty or those requiring clinical judgement on an individual basis

4.5.2 Development process



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Appendix A: Standard medication terms and abbreviations

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	mL
millimole	mmol
percentage	%
units	unit (s)
Dose frequency (intended meaning)	**Safe term/abbreviation**
< or >	less than, greater than
after food	after food
at midday	midday
at night	night, nocte
before food	before food
every second day, on alternate days	every 2 days
every two weeks, per fortnight	every two weeks
every x hours	every x hours, x hourly x hrly
for one day only	for 1 day
for three days	for 3 days
four times a day	qid
hourly, every hour	hourly, every hour
immediately	stat
in the morning	mane, morning
once a week	once a week and specify day of the week
once daily, once a day, daily, every day	once a day, daily
single dose	once
three times a day	tds
twice a day	bd
when required	prn
with food	with food

Source: Australian Commission on Safety and Quality in Health Care. Re commendations for terminology, abbreviations and symbols used in medicines documentation. 2016.

Appendix B: Routes of administration and dose forms

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
intradermal	intradermal
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
per vagina	PV
percutaneous enteral gastrostomy	PEG
peripherally inserted central catheter	PICC
right	right
subcutaneous	subcut
sublingual	subling, under the tongue
topical	topical
Dose form (intended meaning)	**Safe term/abbreviation**
capsule	capsule, cap
cream	cream
ear drops	ear drops
ear ointment	ear ointment, ear oint
eye drops	eye drops
eye ointment	eye ointment, eye oint
injection	injection, inj
metered dose inhaler	metered dose inhaler, inhaler, mdi
mixture	mixture
nebule	NEB
ointment	ointment, oint
patient controlled analgesia	PCA
pessary	pess
powder	powder
suppository	supp
tablet	tablet, tab

Source: Australian Commission on Safety and Quality in Health Care. Re commendations for terminology, abbreviations and symbols used in medicines documentation.

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