Recommendations for safe use of **medicines terminology**

November 2024

AUSTRALIAN COMMISSION ON SAFETY AND QUALITY IN HEALTH CARE

Published by the Australian Commission on Safety and Quality in Health Care

Level 5, 255 Elizabeth Street, Sydney NSW 2000
Phone: (02) 9126 3600
Email: mail@safetyandquality.gov.au
Website: www.safetyandquality.gov.au

ISBN: 978-1-922880-96-3

The Commission's preference is that you attribute this publication (and any material sourced from it) using the following citation:

Australian Commission on Safety and Quality in Health Care. Recommendations for safe use of medicines terminology. Sydney: ACSQHC; 2024.

Disclaimer

The content of this document is published in good faith by the Commission for information purposes. The document is not intended to provide guidance on particular healthcare choices. You should contact your health care provider for information or advice on particular healthcare choices.

The Commission does not accept any legal liability for any injury, loss or damage incurred by the use of, or reliance on, this document.

Acknowledgement

The Commission gratefully acknowledges all those who have provided feedback and contributed to the ongoing review and maintenance of this document.

Contents

Executive summary 1

Figure 1: Best Practice Principles for safe, clear and consistent terminology for medicines 2

Introduction and application 3

Introduction 3

Application of the recommendations and best practice principles 3

Limitations, implementation and risk management 4

Limitations, implementation and risk management 4

Best Practice Principles for safe, clear and consistent terminology for medicines 6

Best Practice Principle 1 1

Best Practice Principle 2 6

Best Practice Principle 3 6

Table A: Unacceptable, 'error-prone' abbreviations relating to instructions and routes of administration 6

Best Practice Principle 4 10

Best Practice Principle 5 10

Best Practice Principle 6 10

Table B: Common 'error-prone' or unacceptable abbreviations for medicine names and chemical names that should be written in full 11

Best Practice Principle 7 13

Best Practice Principle 8 13

Best Practice Principle 9 13

Best Practice Principle 10 13

Best Practice Principle 11 13

Best Practice Principle 12 14

Best Practice Principle 13 14

Figure 2: Fractions in dosing instructions 14

Best Practice Principle 14 14

Best Practice Principle 15 15

Best Practice Principle 16 15

Best Practice Principle 17 15

Figure 3: Acceptable codes: Reasons for withholding or not administering 15

Table C: Examples of symbols that are unacceptable or should be avoided 16

List of acceptable terms, abbreviations and dose designations 17

Table D: Dose frequency or timing 17

Table E: Routes of administration 19

Table F: Dose designations: Units of measure, concentration and rates of administration 20

Table G: Dose forms 21

References 22

Executive summary

This document is an update and renaming of the *Recommendations for Terminology, Abbreviations and Symbols used in the Medicines Documentation*.[1] The document has been modified by the Australian Commission on Safety and Quality in Health Care (the Commission)* based on reported adverse events and international trends in 'error-prone' medicines terminology and informed by a literature review and environmental scan.[3]

Medication errors are one of the most reported clinical incidents in acute health care settings and, while rates of serious harm are low, their prevalence is of concern particularly as many are preventable. A recognised major cause of medication errors is the use of potentially dangerous abbreviations and dose expressions, with 'error-prone' abbreviations being used in 8.4% of in-hospital handwritten medication orders.[4]

An abbreviation, term or symbol used by a prescriber may mean something quite different to the person interpreting the medicine order, for instance, for dispensing or administration; or for patients (their family and/or carers) or other prescribers. Abbreviations that are unclear, ambiguous or incomplete may be misunderstood, and have been identified as 'error-prone'. In addition, when combined with words or numerals, the information may appear as something altogether unintended.

> **'Error-prone' terminologies are a critical patient safety issue due to the potential for misinterpretation and should never be used in any communications about medicines (verbal, digital or handwritten), including policies, guidelines, posters or presentations.**

All medicines information is recommended to be presented in full within digital displays, without abbreviation.[5] However, there are some situations, such as small screen devices where abbreviations are required. In addition, abbreviations and acronyms may be helpful in accelerating the entry of clinical data, such as 'sig codes'. Any keystroke combinations or shortened forms to enable rapid data entry should be unambiguous and displayed using the full name or terminology to achieve correct digital presentation.

To eliminate the use of ambiguous 'error-prone' medicines terminology and promote patient safety, this document sets out:

- To identify and explain the problem with the use of unacceptable or 'error prone' medicines terminology
- Best Practice Principles for safe, clear and consistent terminology for medicines (summarised in Figure 1)
- Acceptable terms and dose designations for medicines
- Standardised abbreviations for circumstances where full expression is not possible.

This document promotes and underpins the use of safe, clear and consistent abbreviations and terminology for the *National Guidelines for On-screen Display of Medicines Information*[5] and the National standard for labelling dispensed medicines.[6] All three documents are applicable in all health settings.

A Fact sheet: Recommendations for safe use of medicines terminology[7] is available to support health service organisations and clinicians apply the recommendations and best practice principles. It includes the full list of acceptable terms, abbreviations and dose designations.

---

* In December 2008 Australian Health Ministers endorsed the original version of the *Recommendations for Terminology, Abbreviations and Symbols used in the Prescribing and Administration of Medicines*[2] for use in all Australian hospitals. The 2011 version was prepared by the NSW Therapeutic Advisory Group's Safer Medicines Group for the Australian Commission on Safety and Quality in Health Care.

Executive summary

Figure 1: Best Practice Principles for safe, clear and consistent terminology for medicines

Best Practice Principle 1: Use plain language – avoid jargon

Best Practice Principle 2: Write or display all characters clearly – especially when handwriting medicine details

Best Practice Principle 3: Write, display or speak instructions and routes of administration in full

Best Practice Principle 4: Instructions must be clear

Best Practice Principle 5: Use active ingredient medicine names

Best Practice Principle 6: Write, display or speak medicine names and/or the chemical names of medicines in full – do not abbreviate

Best Practice Principle 7: Write or display days of the week names in full – or at a minimum the first three letters

Best Practice Principle 8: Incorporate safety features within digital systems to address unavoidable use of abbreviations

Best Practice Principle 9: Do not include the salt of the chemical unless it is clinically significant

Best Practice Principle 10: Use 'mixed-case lettering' for 'look-alike, sound-alike' medicines

Best Practice Principle 11: Express the dose, preferably as whole numbers, using words or Hindu-Arabic numbers. Apply metric units and do not use trailing zeros

Best Practice Principle 12: Use 24 hour time/clock format for time of day administration

Best Practice Principle 13: Express fractions in words – see examples in Figure 2

Best Practice Principle 14: Do not use symbols

Best Practice Principle 15: Do not use acronyms or abbreviations for medical terms and procedure names on orders or prescriptions

Best Practice Principle 16: Express numbers of 1,000 or more clearly

Best Practice Principle 17: Use acceptable circled codes on paper-based medication charts – see codes in Figure 3

Introduction

To eliminate the use of ambiguous 'error-prone' terms and promote patient safety, the Commission promotes the use of safe, clear and consistent abbreviations and terminology via a set of Best Practice Principles.

Medicine name(s) should be displayed in the prescription, medication order, medicines list or selection list in full, with no abbreviation. All active ingredient names must be displayed, except for combination products with four or more active ingredients or components, which may be described by brand name. In some instances, including the brand in addition to the active ingredient should be considered. For further information on these exceptions and presentation of medicine names, refer to the materials and resources on active ingredient prescribing (AIP)[8] and the *National Guidelines for On-screen Display of Medicines Information*.[5]

The Commission also supports elimination of 'error-prone' terminology and language to improve health and medicines literacy. This enables individuals and their carers to have appropriate information about their medicines, through various sources, including My Health Record.

People taking medicines and their carers have the right to understand which medicines are being prescribed for them and that they are being administered as intended. Technical terms are not well understood and using codes, symbols, or an outmoded language is not acceptable.

People with low health literacy have difficulty reading and interpreting instructions and warnings about their medicines, and this can be compounded by the increasing digital display of medicines- or health-related information.[9] In Australia, whilst the majority (83%) of people surveyed in 2018 felt that they were able to 'appraise health information', up to 17% people 'disagreed or strongly disagreed' they could do so.[10] People with low health literacy are reported to be more likely to have worse health outcomes and adverse health behaviours, including poorer understanding of medicine instructions leading to non-adherence and/or improper usage.[11,12]

Application of the recommendations and Best Practice Principles

The Best Practice Principles and list of acceptable terms, abbreviations and dose designations apply to all medicine orders and medicines documentation and are relevant to the Australian context. This includes all handwritten, pre-printed or electronically generated or displayed medicine-related resources used in Australian hospitals or health services.

Verbal communications should also avoid use of abbreviations and outmoded or truncated language when relaying clinical information about a person's medical treatment. Effective communication, in all forms, supports safe and high-quality care.[13] This includes effective communication of critical information during clinical handover.[14]

Since 2016, many health services have moved from paper-based to digital medication management systems where efforts have focused on integrating principles from the Commission's *National Guidelines for On-screen Display of Medicines Information*.[5] Hybrid versions of these systems may also be in use, for example, where medicine orders are digitally generated and printed to paper which is used to record administration of these medicines.

In some situations, the medicines catalogue data base that supports digital medication management systems does not align with this guidance. In these circumstances risk management principles need to be applied by health service organisations (see Risk management).

Limitations, implementation and risk management

This document is not an exhaustive list of all terminologies relating to medicines. Rather, it provides standardised guidance for the most frequently used terms and abbreviations in the Australian context. The absence of a term, abbreviation or symbol does not imply that it is safe to use (*see* Risk management).

The Institute for Safe Medication Practices (ISMP) is a peak body based in the US focused solely on improving the safety of medication systems and medicines use. The ISMP maintains a comprehensive list of terminologies known to be 'error-prone'[15] and The Joint Commission have published a 'Do Not Use' List.[16]

Wherever possible, all medicines information should be presented in full, with no abbreviation.[4] Where full presentation is not possible due to limitations of space, such as small screen devices, then the standard terms and abbreviations described here may be used.

This guidance applies to all formats of medicines information presentation where space is provided for a full description. This includes prescriptions, medication charts, discharge summaries, My Health Record and dispensed medicine labels.

Smart pump technologies

Use of smart pump technologies has expanded and whilst the use of abbreviations is not supported, health services have found the character limits within these technologies have forced the use of abbreviations. In 2023, the Victorian Therapeutics Advisory Group (VicTAG) released a 'Victorian Framework for Implementation of smart infusion pumps' which provides guidance on managing the '20 character' limit for the display of medicines-related information.[17]

Medicines imported from overseas

For medicines that are imported from overseas and are not registered on the TGA's Australian Register of Therapeutic Goods, health service organisations' medicines governance groups should apply a risk management approach to determine how medicines information should be presented (*see* Risk management). This includes, but is not limited to, medicines accessed through the Special Access Scheme (SAS) or TGA-approved alternatives available during a medicine shortage. It will be important to assess safety considerations when accessing alternative products as outlined within the Principles for safe selection and storage of medicines.[18]

Limitations, implementation and risk management

Risk management

Given that this document is not exhaustive, health service organisations may need to consider whether additional terminologies (abbreviations and/or symbols), are also safe to use. If requests are made it is recommended that the organisation's medicines governance group should initially review and apply the *Recommendations for safe use of medicines terminology* before incorporating into local policy, procedures or guidelines. It is also recommended that a risk assessment be conducted before any new or additional terminologies are approved and implemented.

The organisation's medicines governance group should also continue to monitor incidents associated with the use of medicines terminology.

Monitoring the use of 'error-prone' terminology

Monitoring 'error-prone' terminologies within health service organisations should be targeted as part of a comprehensive program of continuous quality improvement. Where uncertainty exists, and clarification must be sought to avoid potential misinterpretation and medication error, then the terminology must be deemed unsafe, unclear or ambiguous.

The *National Quality Use of Medicines Indicators for Australian Hospitals Indicator 3.3: Percentage of medication orders that include error-prone abbreviations* may assist organisations to assess ongoing progress and performance.[19] Use of 'error-prone' abbreviations may also be monitored through the National Standard Medication Chart Audit.[20]

Application of the Best Practice Principles outline within the *Recommendations for safe use of medicines terminology* will assist health services being assessed against the National Safety and Quality Health Service Standards.

This document is valid as at November 2024 and may be modified based on issues arising from 'error-prone' terminology. Requests for additions or changes to the *Recommendations for safe use of medicines terminology* will be considered by the Commission. Evidence or information regarding the potential safety risks should be emailed to medsafety@safetyandquality.gov.au.

Best Practice Principle 1: Use plain language – avoid jargon*,†

Plain language, when words are written, displayed or spoken in full, is easier to understand and less likely to cause confusion, be misunderstood or be misread.

Best Practice Principle 2: Write or display all characters clearly – especially when handwriting medicine details

Avoid cursive handwriting. To avoid misreading instructions and doses, clearly separate different elements of the medicine order so that letters do not appear to flow into the numbers that follow, and vice versa. Leave space between numbers and units of measure (for instance, a single blank space when displayed digitally), to ensure numbers do not appear to flow into the units of measure that follow. For example, 25 mg or 32 units in digital displays.

Exception when expressing percentages, for example, 5% or 0.45%.

Best Practice Principle 3: Write, display or speak instructions and routes of administration in full

Avoid using abbreviations. In circumstances where abbreviations are required, avoid Latin abbreviations that are not universally understood. Do not use plural abbreviations except for units and description of time, for example, hours, days or weeks. Table A includes unacceptable, 'error-prone' abbreviations relating to instructions and routes of administration.[1,3,15,16]

Whilst abbreviations or acronyms may be helpful in accelerating the entry of clinical data, such as 'sig codes', they should display in full. For example on a medicine label.[5] **See** Best Practice Principle 8.

Table A: Unacceptable, 'error-prone' abbreviations relating to instructions and routes of administration

Unacceptable abbreviations	Recommended alternative	Issue
2º, 2h, 2 hrly	'every 2 hrs' or 'every 2 hours'	Can be confused with other unsafe abbreviations, noting that '2 hrly' is an exception to other similarly expressed dose frequency or timings
4/24, 6/24, 8/24, etc.	'every 4 hrs', 'every 4 hours', etc.	Can be confused with other unsafe abbreviations if not displayed/written clearly *See* Table D for acceptable abbreviations for dose frequency and timing
ac and pc	before food and after food	Latin term that is not always understood by all people Should be written in full

* *Collins dictionary* definition language that is clear and easy to understand with no ambiguity or unnecessarily difficult words.

† *Australian Government Style Manual*: use words that people are familiar with. For example, avoid occupation-specific language.

Table A: Unacceptable, 'error-prone' abbreviations relating to instructions and routes of administration (continued)

Unacceptable abbreviations	Recommended alternative	Issue
cc	mL	Use of 'cc' is poorly understood and use of this abbreviation risks lack of consistency with accepted and standard abbreviation
D	daily	Can be interpreted as day or dose, or mistaken for a number
D/C	'discharge' or 'discontinue', whichever is intended	Uses of term risks causing premature discontinuation of medicines if discharge is the intended meaning Can be mistaken for 'discharge' or 'discontinue'
E, e	eye or ear	Can be mistaken for 'ear' when 'eye' is intended or for 'ear' when 'eye' is intended
gm	gram, g	*See* Best Practice Principle 5 and Table F for acceptable abbreviations for dose designations
gutte, gtt	drops	Latin term that is not always understood by all people
HS, hs	Half-strength or bedtime	Latin term that is not always understood by all people Can be mistaken for 'half-strength' or 'bedtime', whichever is intended
IN	intranasal	Can be mistaken as 'IM' (intramuscular) or 'IV' (intravenous)
INH, inh	inhale, inhalation	Can be mistaken for other routes of administration
IO	intraosseous	Can be mistaken as '10' (ten) or 'oral'
IP	intraperitoneal	Can be confused with 'IV'
IR	N/A	IR or 'immediate release' can be confused for other unsafe abbreviations **Exception:** 'IR' may be included if it is a part of a medicines' brand name only (i.e. not a part of the active ingredient medicine name).
IVI	IV	Can be mistaken as 'IV 1'
LE, RE	left ear or eye, right ear or eye	Can be mistaken for 'ear' when 'eye' is intended or for 'ear' when 'eye' is intended
M	morning, mane	Can be mistaken for million or thousand
mcg, ug, µg	microgram, MICROg, microg	Can be mistaken as milligram (mg)
midi	midday	Latin term that is not always understood by all people Should be written in full
N, ON	night, nocte	Should be written in full

Table A: Unacceptable, 'error-prone' abbreviations relating to instructions and routes of administration (continued)

Unacceptable abbreviations	Recommended alternative	Issue
NIA, NIM	nurse-initiated analgesia, nurse-initiated medicine	Can be mistaken for each other Should be written in full
OAT, OST, OSTP	opioid agonist therapy or 'treatment program'	Should be written in full When prescribing, include the specific medicine's active ingredient name and details
OD, od, O.D.	'once a day' or 'daily'	Can be mistaken as 'right eye' (OD-oculus dexter), leading to oral liquid medicines being administered in the eye Can also be mistaken as 'BD twice daily' or 'QID four times a day', for instance, instead of once a day the intended dose could be given twice or four times a day in error *See* Table D for acceptable abbreviations for dose frequency and timing
OJ	orange juice	Can be mistaken as 'OD' or 'OS' (ocular sinister), right or left eye, respectively, and the risk that medicines meant to be diluted in orange juice may be given in the eye
OS, OD	left eye, right eye	Latin terms that are not always understood by all people (OS – oculus sinister and OD – oculus dexter) Can be mistaken for 'once a day' or 'daily' *See* Table E for acceptable abbreviations for routes of administration
Q1H, Q4H, Q6H, Q8H, etc.	'hourly', 'every 4 hrs', 'every 4 hours', etc.	Latin term that is not always understood by all people Can be confused with other unsafe abbreviations *See* Table D for acceptable abbreviations for dose frequency and timing
QD, qd, Q.D.	'daily'	Latin term that is not always understood by all people Can be mistaken for 'QID', for instance, instead of once a day the intended dose could be given four times a day in error *See* Table D for acceptable abbreviations for dose frequency and timing
QDS, qds	'four times a day'	Latin term that is not always understood by all people Can be confused with other unsafe abbreviations *See* Table D for acceptable abbreviations for dose frequency and timing
Qhs	'at night', 'daily at bedtime'	Latin term that is not always understood by all people Can be mistaken for 'every hour' *See* Table D for acceptable abbreviations for dose frequency and timing

Table A: Unacceptable, 'error-prone' abbreviations relating to instructions and routes of administration (continued)

Unacceptable abbreviations	Recommended alternative	Issue
QOD, qod	'every second day', 'on alternate days'	Latin term that is not always understood by all people Can be confused with other unsafe abbreviations *See* Table D for acceptable abbreviations for dose frequency and timing
SCI, SC, sc	subcutaneous, subcut	Can be confused with other unsafe abbreviations, for instance, mistaken for 'SL' (sublingual)
SL	sublingual, subling	Can be confused with other unsafe abbreviations, for instance, mistaken for 'SC' (subcutaneous)
SS	single strength	Can be confused with other unsafe abbreviations, for instance, 'SSI' (sliding scale insulin)
SSRI, SSI	sliding scale (regular) insulin	Can be mistaken as 'Selective Serotonin Reuptake Inhibitor' or 'Strong Solution of Iodine'
tid	tds	Can be confused with other unsafe abbreviations or acceptable latin abbreviations, for instance, mistaken for 'bd' (twice daily), especially in handwritten documentation
TIW, tiw	three times a week	Latin term that is not always understood by all people Can be confused with other unsafe abbreviations, for instance, mistaken for 'tid' (three times daily) or 'twice a week', especially in handwritten documentation
TOP, top	'topical'	Can be mistaken for other routes of administration or 'TAB' (tablet), especially in handwritten documentation *See* Table E for acceptable abbreviations for routes of administration
TPT	'transpyloric tube'	Can be mistaken for other routes of administration and/or confused with 'TPLT' which is often abbreviated for 'transplant' and is not an acceptable abbreviation *See* Best Practice Principle 16 and Table E for acceptable abbreviations for routes of administration
U or u	unit(s)	Can be mistaken as the number '0' or '4', causing a 10-fold overdose or greater, for example, '8U' seen as '80' or '4u' seen as '44' Can be mistaken as 'cc' so dose given as a volume instead of units, for example, '4u' seen as '4 cc'
IU	unit(s), [international unit(s)]	Use plural form where appropriate Can be mistaken as 'IV' (intravenous) or the number '10' **Exception:** As an example, the amount of bleomycin can be referred to in 'international units'. Other exceptions such as ELISA units and D antigen units, should be explicitly stated.

Best Practice Principle 4: Instructions must be clear

Avoid vague terminology such as 'take as directed' (MDU).[21] Clear directions are necessary to check the medicine dose for dispensing and administration and to support effective counselling. In addition, the maximum dosage in 24 hours must accompany a 'when required' (PRN) medicine order.[5]

Best Practice Principle 5: Use active ingredient medicine names

The full medicine name(s) should be displayed in the prescription, medication order/order set, medicines list or selection list, with no abbreviation.

All active ingredient names must be displayed together with the relevant strength for combination products, **except those with four or more active ingredients and those listed on the List of Excluded Medicinal Items[22], which may be described by brand name**.

For example:

- A medicine with three active ingredients, such as Trizivir® tablets, should be expressed as abacavir 300 mg + lamivudine 150 mg + zidovudine 300 mg.

Prescribing a medicine by brand name in addition to the active ingredient name is preferrable in some circumstances, for clinical reasons and/or patient safety.[7] These medicines are listed in the List of Medicines for Brand Consideration.[23]

For some medicines, it may be preferable to include the brand name, to avoid miscommunication of the medicine between clinicians, to prevent selection error, and to ensure accuracy when interpreting and dispensing the prescription.

For example:

- lithium carbonate (Lithicarb®), lithium carbonate modified release (Quilonum®)
- insulin aspart (Novorapid®) [*See* Fact Sheet: Safer insulin prescribing][24]
- morphine [as sustained release pellets in a capsule] (Kapanol®) and morphine [controlled release tablets] (MS Contin®).

For some medicines, formulations are not interchangeable as different brands of the same active ingredient are not therapeutically equivalent.

For example:

- warfarin, use Coumadin® or Marevan®
- insulin aspart, use Fiasp® or Novorapid®.

Refer to the List of Medicines for Brand Consideration for other examples **where preparations of certain medicines are not interchangeable**.[23]

Best Practice Principle 6: Write, display or speak medicine names and/or the chemical names of medicines in full – do not abbreviate

To prevent error and confusion, and align with the requirements for active ingredient prescribing (AIP)[8], avoid abbreviating medicine names entirely. Also refer to Table B for a list of common 'error-prone' or unacceptable abbreviations for medicine and chemical names.

Abbreviating medicine names or the chemical names of medicines can lead to error. For example, 'HCT' for 'hydrocortisone' has been mistaken for 'hydrOCHLOROTHIAZIDe'. This also includes antiretrovirals which must ALWAYS be expressed in full by using the complete active ingredient name(s) **except those on the List of Excluded Medicinal Items[22] with four or more active ingredients which may be described by brand name** in accordance with Best Practice Principle 5.

Whilst exceptions may exist, it is also preferable to write, display or speak the medicine class in full. For example, PPI = proton pump inhibitor.

For protocols with multiple individual medicines, prescribe each medicine separately and in full.

Avoid use of acronyms or abbreviations, for example, 'CHOP' for chemotherapy.[25] Noting that each protocol must be distinguishable and prescribing needs to include the full details of all the medicines, including active ingredient names.

Exceptions may be made for modified-release (MR) products.

For handwritten medicine orders in particular, the description used in the brand name to denote the release characteristics should also be included with the active ingredient name when prescribing a medicine. For example, 'tramadol **SR**', 'carbamazepine **CR**'.

This applies to slow-release (SR), controlled-delivery (CD), controlled-release (CR), extended-release (XR), long acting (LA), osmotic controlled-release, continuous-release or other modified or time-release formulations, for instance, hydrodynamically balanced system with controlled release (HBS).

Table B: Common 'error-prone' or unacceptable abbreviations for medicine names and chemical names that should be written in full

Unacceptable abbreviations	Recommended alternative
5-FU	fluorouracil
6-MP	mercaptopurine
ADF	Augmentin Duo Forte®
APAP	paracetamol
ASA	acetylsalicylic acid
AZA	azATHIOPRINE
AZT	zidovudine
CBD	cannabidiol
CBN	cannabinol
DEX	dexAMETHasone or dexmedeTOMIDine or dexamfetamine
EPO	epoetin
G-CSF	granulocyte colony stimulating factor, or active ingredient name of the medicine: filgrastim, lenograstim, lipegfilgrastim or pegfilgrastim
G5W, D5W	5% glucose in water
GTN	glyceryl trinitrate
HCl	hydrochloric acid
HCT	hydrocortisone or hydrOCHLOROTHIAZIDe

Table B: Common 'error-prone' or unacceptable abbreviations for medicine names and chemical names that should be written in full (continued)

Unacceptable abbreviations	Recommended alternative
HCTZ	hydrOCHLOROTHIAZIDe
ISMN	isosorbide mononitrate
KCl	potassium chloride*
LMWH	low molecular weight heparin
$MgSO_4$	magnesium sulfate
MS or MSO_4	morphine, morphine sulfate
MTX	methotrexate
NaCl, saline, NS	sodium chloride, sodium chloride 0.9%
½ NS	sodium chloride 0.45%
$NaHCO_3$	sodium bicarbonate
NOAC, DOAC	Use active ingredient name of the medicine or anticoagulant
OXY	oxycodone (oxyCONTIN) or oxytocin
rt-PA	reteplase
T3	liothyronine, triiodothyronine (can be mistaken as levothyroxine, which is sometimes referred to as T3 in error)
T4	thyroxine, levothyroxine
TAC†	TACrolimus
THC	tetrahydrocannabinol
TPA or r-TPA or t-PA	tissue plasminogen activator, or active ingredient name of the medicine: alteplase, tenecteplase, or other medicine within this class
TNK	tenecteplase
$ZnSO_4$	zinc sulfate

* Other potassium salts to be written in full, for example, potassium dihydrogen phosphate.

† Can be mistaken for tetracaine, adrenaline and cocaine.

Best Practice Principle 7: Write or display days of the week names in full – or at a minimum the first three letters

For example, 'Tuesday' or 'Tue'.

Best Practice Principle 8: Incorporate safety features within digital systems to address unavoidable use of abbreviations

For instance, when the use of an acceptable abbreviation is unavoidable, hovering the computer 'cursor' over the abbreviation displays the expansion:

- NJ = nasojejunal
- PCA = patient-controlled analgesia
- PEG = percutaneous enteral gastrostomy
- PEJ = percutaneous endoscopic jejunostomy
- PICC = peripherally inserted central catheter.

Best Practice Principle 9: Do not include the salt of the chemical unless it is clinically significant

For example, 'mycophenolate mofetil' or 'mycophenolate sodium' are examples of salts that are clinically significant. Where a salt is part of the name, it should follow the medicine name and not precede it.

Best Practice Principle 10: Use 'mixed-case lettering' for 'look-alike, sound-alike' (LASA) medicines

This should be done for LASA medicine names known to cause confusion. Refer to the *National Mixed-Case Lettering List*[26] for additional guidance, including a standard list that has been developed to help reduce the risk of LASA medicine names selection errors.[26]

Best Practice Principle 11: Express the dose, preferably as whole numbers, using words or Hindu-Arabic numbers. Apply metric units and do not use trailing zeros

- **Use words or Hindu-arabic numbers.** Use 1, 2, 3, etc., preferably followed by a space and then the unit of measure, i.e. '1 tab/tablet', '2 puffs', '3 caps/capsules'.
- **Do not use Roman (or modified Roman) numerals.** Do not use 'i' to mean one, 'ii' to mean two, 'iii' for three, 'v' for five, etc.
- **Use metric units.*** Use metric units such as 'gram' or 'mL' rather than Imperial or other measurements. Do not use household measurements such as 'tsp' or 'teaspoon'.
- **Use a leading zero in front of a decimal point for a dose less than 1.** Do not use a 'naked' decimal point without a leading zero, for example, use '0.5' not '.5'.
- **Do not use trailing zeros.** For example, use '5' not '5.0' for doses of medicines expressed in whole numbers. Trailing zeros can be mistaken as a 'zero'. For example, '5.0' can be mistaken as '50'.

  Exception: While the recording of pathology or laboratory results is out of the scope of this document, it is acknowledged that a 'trailing zero' may

* Metric units are based upon scientific notation. The main difference is that scientific notation uses the power of 10 to show the magnitude of a number.

be used to express the level of precision of the reported value, for example, where blood levels are reported on the chart.

- **Do not follow abbreviations such as 'mg' or 'mL' with a decimal point or terminal full stop ('mg.' or 'mL.').** This can be mistaken as the number 1 if written poorly. For instance, use 'mg' or 'mL', without a terminal full stop.[15]
- **Express dosage frequency unambiguously.** For example, use 'three times a week' not 'three times weekly' (nor 'thrice weekly'), as the latter could be confused as 'every three weeks'. In addition, when including the days of the week, express in accordance with Best Practice Principle 7.

Best Practice Principle 12: Use 24-hour time/clock format for time-of-day administration

Times using a 24-hour clock format should use a colon to separate hours and minutes. To remove ambiguity, for times before and after midday, consider appending with 'am' and 'pm' respectively. For example, '11:30 am' and '14:00 pm'. This may not be practical on a medication chart or necessary within digital systems.

Midnight medicines administration should be avoided where possible, as '00:00' may be mistaken for midday. Instead consider dosing at a different time, for instance at 11:30 pm.

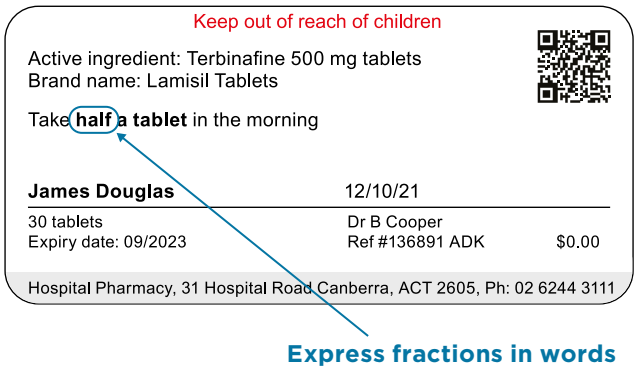
Best Practice Principle 13: Express fractions in words

Write fractions in words to prevent misreading numbers.

For example:

- '1/7' could be interpreted as 'for one day', 'once daily', 'for one week' or 'once weekly'
- 6/24 could be interpreted as 'every 6 hours'
- '1/2' (or '½') could be interpreted as 'half' or as 'one to two'. To avoid confusion, express clearly in full as 'half', not '0.5' or '½'.

Figure 2: Fractions in dosing instructions



This label has been adapted from the National standard for labelling dispensed medicines.[5]

Best Practice Principle 14: Do not use symbols

Avoid, for example, '2º' to mean 'every two hours'. This is mostly relevant for handwritten orders.

Exception: the symbol '+' may be used as a separator in digital displays to combine two or more active ingredients.[5]

Table C includes examples of symbols that are unacceptable or should be avoided, in particular for handwritten medicine orders.

Best Practice Principle 15: Do not use acronyms or abbreviations for medical terms and procedure names on orders or prescriptions

Acronyms or abbreviations can have multiple uses and be mistaken. For example, 'D/C' may mean 'discharge' or 'discontinue'; do not use 'EBM' to mean 'expressed breast milk' or 'TPLT' for 'transplant'.

Best Practice Principle 16: Express numbers of 1,000 or more clearly

Use commas for dosing units at or above 1,000 to prevent misreading numbers. In addition, consider using or writing 'one thousand' instead of '1,000', and 'one million' instead of '1,000,000'. Never abbreviate to '1 k' or '1 K', or '1 m' or '1 M', respectively.

Do not abbreviate by using K or M, noting that 'M' is the Roman numeral for 'thousand'. *See* Best Practice Principle 11.

Best Practice Principle 17: Use acceptable circled codes on paper-based medication charts

The *National Inpatient Medication Chart (NIMC) User Guide*[27] includes a list of acceptable circled codes that must be recorded on paper-based medication charts to indicate the reason for not administering a prescribed medicine. For instance, use when administration is not possible or a dose of a medicine needs to be withheld. *See* Figure 3 and refer to the NIMC User Guide[27] for more information on how to use these codes, including any additional codes that may be applicable. For instance, 'P' with a circle around it is used to record that the medicine was administered by the paediatric patient's parent or carer.

A circled R/V is included as an acceptable code to indicate that a prescribed medicine is 'For Review' as a reason for withholding or not administering a medicine.

By circling the code on the medication chart it will not accidentally be mistaken or misread as someone's initials.

Figure 3: Acceptable codes: Reasons for withholding or not administering

Reason for withholding or not administering Codes MUST be circled	
Absent	(A)
Fasting	(F)
Refused – notify prescriber	(R)
Vomiting	(V)
On leave	(L)
Not available – obtain supply or contact prescriber	(N)
Withheld – enter reason in clinical record	(W)
Self-administered	(S)
Parent/Carer administered	(P)
'For Review'	(R/V)

Table C: Examples of symbols that are unacceptable or should be avoided

Unacceptable symbols	Recommended alternative	Issue/comment
< or >	less than, greater than (alternative term 'longer than' in context of time)	Can be mistaken, or mistakenly used, as opposite of what is intended; and when handwritten '<' can be mistaken for the number '4', for example, '<10' could be misread as '40'
@	at	Can be mistaken as the number '2'. Mostly relevant when handwritten
&	and	Can be mistaken as the number '8'. Mostly relevant when handwritten
Ø	'0' or 'zero' or describe intent in full	Can be mistaken as the numbers '4', '6', '8', and '9' Mostly relevant when handwritten
o̲	hour	Can be mistaken as a zero, or for example 'q2º' mistaken for the number 'q20'. Frequency instructions must be clear *See* Best Practice Principle 3 and Best Practice Principle 11
#	DO NOT USE	Can be mistaken as a number '4' or '8'.
/ (slash mark)	'per', 'in', or other descriptors	Can be mistaken as the number '1'. Mostly relevant when handwritten *See* Best Practice Principle 5, and Best Practice Principle 14 and noted 'exception' **Exception:** retain a slash ('/') when this is consistent with presentations of medicine content information (e.g. as a separator), for instance, considered acceptable when expressing concentration and rates of administration *See* Table F for acceptable expression of dose designations
x1	'once' or 'for one dose'	Can be mistaken for an alternative instruction, for instance 'one day'. Use plain language *See* Best Practice Principle 1 and Best Practice Principle 3
½, 1/2	half	Avoid fractions, irrespective of font size. Express clearly in full *See* Best Practice Principle 13
+	and	Can be mistaken as the number '4' or a '-' (dash) *See* Best Practice Principle 5, and Best Practice Principle 14 and noted 'exception'
X3d	for three days	Can be mistaken as '3 doses'
[ ], ( ) (brackets)	DO NOT USE	Can be mistaken as the number '1'. Mostly relevant when handwritten

List of acceptable terms, abbreviations and dose designations

The following tables list the terms and abbreviations that are commonly used and understood and therefore considered acceptable for use, primarily in written presentations.

They should be written **exactly** as shown.

Table D: Dose frequency or timing

Intended meaning	Acceptable terms or abbreviations
(in the) morning	morning, mane*
(at) midday	midday
(at) night	night, nocte*
(at) bedtime	bedtime
once daily, once a day, daily, every day	'once a day' (preferably specifying the time of day)†, 'daily'
twice a day	bd*, BD*
three times a day	tds*, TDS*
four times a day	qid*, QID*
hourly, every hour	hourly, every hour
every two hours	every 2 hrs, every 2 hours *See* Table A for an explanation of the exception where '2 hrly' is not an acceptable term or abbreviation
every 4 hours	every 4 hrs, 4 hourly, 4 hrly
every 6 hours	every 6 hrs, 6 hourly, 6 hrly
every 8 hours	every 8 hrs, 8 hourly, 8 hrly
every 12 hours	every 12 hrs, every 12 hours
once a week	'once a week' and specify the day, for example, 'once a week on Tue' (or Tuesdays)
twice a week	'twice a week' and specify the exact days, for example, 'twice a week on Mon and Thu'
three times a week	'three times a week' and specify the exact days, for example, 'three times a week on Mon, Wed and Sat'
every second day, on alternate days	every 2 days
every two weeks, per fortnight	every two weeks, every 2 weeks
days of the week	Mon, Tue, Wed, Thur, Fri, Sat, Sun
before food	before food

* Considered acceptable abbreviations only in written presentations, such as, handwritten prescriptions or medicine orders.

† Once a day in the morning at 08:00 am OR once a week on a Tuesday.

Table D: Dose frequency or timing (continued)

Intended meaning	Acceptable terms or abbreviations
after food	after food
with food	with food
when required	prn*, PRN* *See* Best Practice Principle 3 and Best Practice Principle 4
immediately	stat* *See* Best Practice Principle 3
single dose	once
for one day only	for 1 day
for three days	for 3 days

* Considered acceptable abbreviations only in written presentations, such as, handwritten prescriptions or medicine orders.

List of acceptable terms, abbreviations and dose designations

Table E: Routes of administration

Intended meaning	Acceptable terms or abbreviations
buccal	buccal
ear or eye (specify left, right or each/both)	right/left, or each/both, ear or eye
epidural	epidural
inhale, inhalation	inhale, inhalation
intraarticular	intraarticular
intradermal	intradermal
intramuscular	IM
intranasal	intranasal
intraosseous	intraosseous
intraperitoneal	intraperitoneal
intrathecal	intrathecal, IntraTHECAL*
intravenous	IV, IntraVENOUS*
irrigation	irrigation
left	left
naso-gastric	NG
nasojejunal	NJ
nebulised	NEB, ('nebulised' preferred on-screen)
oral	PO
per rectum	PR
per vagina	PV
percutaneous endoscopic jejunostomy	PEJ
percutaneous enteral gastrostomy	PEG
peripherally inserted central catheter	PICC
right	right
subcutaneous	subcut
sublingual	subling, under the tongue
topical	topical

* Mixed-case lettering applied to align with the *National Standard for User-applied Labelling of Injectable Medicines, Fluids and Lines*.[28]

List of acceptable terms, abbreviations and dose designations

Table F: Dose designations: Units of measure, concentration and rates of administration

Intended meaning	Acceptable terms or abbreviations
centimetre, millimetre	cm, mm
gram(s)	g
hour, minute	hour, minute **Exception:** Where 'hrs' and 'hrly' are acceptable abbreviations. *See* Table D for dose frequency or timing.
kilogram	kg
litre(s)	L
metre	metre
microgram(s)	microgram, MICROg, microg
microlitre, micromol, millimolar	microlitre, micromol, millimolar
milliequivalent	mEq
milligram(s)	mg
milligram per litre	mg/L
millilitre(s)	mL
millimole	mmol
millimole per litre	mmol/L
nanogram	nanogram (note: usual abbreviation 'ng' is not acceptable as it can potentially be confused with 'naso-gastric')
parts per million	ppm
percentage, percent	%
square centimetre, square metre	sq cm, sq m **Exception:** For digital display cm^2 and m^2 may also be acceptable if superscript is clearly shown
unit(s)	unit(s)
International unit(s)	unit(s) **Exception:** The amount of bleomycin can be referred to in international units. Other exceptions such as ELISA units and D antigen units, should be explicitly stated.
units per kilogram	units/kg
milligram per minute	mg/min
millilitre per hour	mL/hr
units per hour	units/hr

List of acceptable terms, abbreviations and dose designations

Table G: Dose forms

Intended meaning	Acceptable terms or abbreviations
capsule	capsule, cap*, 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, INJ
metered dose inhaler	metered dose inhaler, inhaler, MDI
mixture	mixture
nebule	NEB
ointment	ointment, oint
patient-controlled analgesia	PCA
pessary	pess
powder	powder
solution	solution
suppository	supp
suspension	suspension
tablet	tablet, tab*, TAB*

* 'TAB', 'tab', 'CAP' and 'cap' are considered acceptable abbreviations in written presentations. However, the expectation is for 'tablet' and 'capsule' to be expressed in full in digital displays, on dispensed medicine labels, and when communicated verbally.

References

1. Australian Commission for Safety and Quality in Health Care. Recommendations for Terminology, Abbreviations and Symbols used in Medicines Documentation. Sydney; 2016.
2. Australian Commission on Safety and Quality in Health Care. Recommendations for Terminology, Abbreviations and Symbols used in the Prescribing and Administration of Medicines. Sydney: ACSQHC; 2011.
3. Australian Commission on Safety and Quality in Health Care. Recommendations for terminology, abbreviations and symbols used in medicines documentation: A Rapid Literature Review. Sydney: ACSQHC; 2023. Available from: www.safetyandquality.gov.au/publications-and-resources/resource-library/recommendations-terminology-abbreviations-and-symbols-used-medicines-documentation-rapid-literature-review
4. Dooley MJ, Wiseman M, Gu G. Prevalence of error-prone abbreviations used in medication prescribing for hospitalised patients: multi-hospital evaluation. Internal Medicine Journal; 2012 Mar; 42(3):e19–22. onlinelibrary.wiley.com/doi/full/10.1111/j.1445-5994.2011.02697.x
5. Australian Commission on Safety and Quality in Health Care. National Guidelines for On-screen Display of Medicines Information. Sydney: ACSQHC; 2017. Available from: www.safetyandquality.gov.au/publications-and-resources/resource-library/national-guidelines-screen-display-medicines-information
6. Australian Commission on Safety and Quality in Health Care. National standard for labelling dispensed medicines. Sydney: ACSQHC; 2021. Available from: www.safetyandquality.gov.au/publications-and-resources/resource-library/national-standard-labelling-dispensed-medicines
7. Australian Commission on Safety and Quality in Health Care. Fact sheet: Recommendations for safe use of medicines terminology. Sydney: ACSQHC; 2024. Available from: www.safetyandquality.gov.au/publications-and-resources/resource-library/fact-sheet-recommendations-safe-use-medicines-terminology
8. Australian Government. Department of Health and Aged Care. Active ingredient prescribing. [Internet] Available from: www.health.gov.au/our-work/active-ingredient-prescribing
9. Institute for Safe Medication Practices. (ISMP). Patients with Low Health Literacy Male More Errors Interpreting Instructions and Warnings. ISMP; 2023. Available from: www.ismp.org/resources/patients-low-health-literacy-make-more-errors-interpreting-instructions-and-warnings
10. Australian Government. Australian Bureau of Statistics. National Health Survey: Health literacy. [Internet] Available from: www.abs.gov.au/statistics/health/health-conditions-and-risks/national-health-survey-health-literacy/2018
11. Marvanova et al. Health literacy and medication understanding among hospitalized adults. J Hosp Med. 2011 Nov;6(9):488-93. doi: 10.1002/jhm.925. pubmed.ncbi.nlm.nih.gov/22042745
12. Miller TA. Health literacy and adherence to medical treatment in chronic and acute illness: A meta-analysis. Patient Educ Couns. 2016 Jul;99(7):1079-86. doi: 10.1016/j.pec.2016.01.020. pubmed.ncbi.nlm.nih.gov/26899632
13. Australian Commission on Safety and Quality in Health Care. Health literacy: Taking action to improve safety and quality. Sydney: ACSQHC, 2014. Available from: www.safetyandquality.gov.au/publications-and-resources/resource-library/health-literacy-taking-action-improve-safety-and-quality

References

14. Australian Commission on Safety and Quality in Health Care. Communicating with patients and colleagues. Communicating for Safety resource portal. [Internet] c4sportal.safetyandquality.gov.au/communicating-with-patients-and-colleagues
15. Institute for Safe Medication Practices. (ISMP). List of Error-Prone Abbreviations, Symbols, and Dose Designations. ISMP; 2024. Available from: www.ismp. org/recommendations/error-prone-abbreviations-list
16. The Joint Commission. Do Not Use List Fact Sheet. [Internet] Available from: www.jointcommission.org/resources/patient-safety
17. Victorian Therapeutics Advisory Group (VicTAG). Victorian Framework: Implementation of smart infusion pumps. Melbourne: VicTAG; 2023. Available from: www.victag.org.au/Victorian_Framework_for_Implementation_of_Smart_Infusion_Pumps_June_2023_formatted.pdf
18. Australian Commission on Safety and Quality in Health Care. Principles for safe selection and storage of medicines – Guidance on the principles and survey tool. Sydney: ACSQHC; 2020. Available from: www.safetyandquality.gov.au/publications-and-resources/resource-library/principles-safe-selection-and-storage-medicines-guidance-principles-and-survey-tool
19. Australian Commission on Safety and Quality in Health Care and NSW Therapeutic Advisory Group Inc. National Quality Use of Medicines Indicators for Australian Hospitals. Sydney; 2014. Available from: www.safetyandquality.gov.au/publications-and-resources/resource-library/national-qum-indicators-2014-complete-set
20. Australian Commission on Safety and Quality in Health Care. National Standard Medication Chart (NSMC) Audit. [Internet] Available from: www.safetyandquality.gov.au/our-work/medication-safety/national-standard-medication-chart-nsmc-audit
21. National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP). Recommendations to Enhance Accuracy of Prescription/Medication Order Writing. NCC MERP. USA; October 2014. Accessed April 2024. Available from: www.nccmerp.org/recommendations-enhance-accuracy-prescription-writing
22. Australian Government. Department of Health and Aged Care. List of Excluded Medicinal Items – Active ingredient prescribing. [Internet] Available from: www.health.gov.au/our-work/active-ingredient-prescribing/lemi-lmbc/lemi
23. Australian Government. Department of Health and Aged Care. List of Medicines for Brand Consideration – Active ingredient prescribing. [Internet] Available from: www.health.gov.au/our-work/active-ingredient-prescribing/lemi-lmbc/lmbc
24. Australian Commission on Safety and Quality in Health Care. Fact Sheet: Safer insulin prescribing. Guidance for Australian prescribers. Sydney: ACSQHC; 2022. Available from: www.safetyandquality.gov.au/publications-and-resources/resource-library/fact-sheet-safer-insulin-prescribing
25. Clinical Oncological Society of Australia (COSA). Guidelines for the Safe Prescribing, Supply and Administration of Cancer Chemotherapy. Sydney: COSA; 2017. Available from: cosa_guidelines_safeprescribingchemo2008.pdf

References

26. Australian Commission on Safety and Quality in Health Care. National Mixed-Case Lettering List. Sydney: ACSQHC, 2024. Available from: www.safetyandquality.gov.au/publications-and-resources/resource-library/national-mixed-case-lettering-list
27. Australian Commission on Safety and Quality in Health Care. National Inpatient Medication Chart (NIMC) User Guide. Sydney: ACSQHC; 2019. Available from: www.safetyandquality.gov.au/sites/default/files/2019-08/nimc_user_guide_2019.pdf
28. Australian Commission on Safety and Quality in Health Care. National Standard for User-applied Labelling of Injectable Medicines, Fluids and Lines. Sydney: ACSQHC; 2015. Available from: www.safetyandquality.gov.au/publications-and-resources/resource-library/national-standard-user-applied-labelling-injectable-medicines-fluids-and-lines


100 mg

Australian Commission on Safety and Quality in Health Care
Level 5, 255 Elizabeth Street SYDNEY NSW 2000
GPO Box 5480 SYDNEY NSW 2001

Telephone: (02) 9126 3600
mail@safetyandquality.gov.au
www.safetyandquality.gov.au

AUSTRALIAN COMMISSION
ON SAFETY AND QUALITY IN HEALTH CARE