ISMP List of Error-Prone Abbreviations, Symbols, and Dose Designations

ISMP
Institute for Safe Medication Practices

The abbreviations, symbols, and dose designations in the **Table** below were reported to ISMP through the ISMP National Medication Errors Reporting Program (ISMP MERP) and have been misinterpreted and involved in harmful or potentially harmful medication errors. These abbreviations, symbols, and dose designations should **NEVER** be used when communicating medical information verbally, electronically, and/or in handwritten applications. This includes internal communications; verbal, handwritten, or electronic prescriptions; handwritten and computer-generated medication labels; drug storage bin labels; medication administration records; and screens associated with pharmacy and prescriber computer order entry systems, automated dispensing cabinets, smart infusion pumps, and other medication-related technologies.

In the **Table**, error-prone abbreviations, symbols, and dose designations that are included on The Joint Commission's "**Do Not Use**" list (Information Management standard IM.02.02.01) are identified with a double asterisk (******) and must be included on an organization's "**Do Not Use**" list. Error-prone abbreviations, symbols, and dose designations that are relevant mostly in handwritten communications of medication information are highlighted with a dagger (**†**).

Table. Error-Prone Abbreviations, Symbols, and Dose Designations

Error-Prone Abbreviations, Symbols, and Dose Designations	Intended Meaning	Misinterpretation	Best Practice
Abbreviations for Doses/Measurement Units			
cc	Cubic centimeters	Mistaken as u (units)	Use mL
IU**	International unit(s)	Mistaken as IV (intravenous) or the number 10	Use unit(s) (International units can be expressed as units alone)
l ml	Liter Milliliter	Lowercase letter l mistaken as the number 1	Use L (UPPERCASE) for liter Use mL (lowercase m, UPPERCASE L) for milliliter
MM or M **M or K**	Million Thousand	Mistaken as thousand Mistaken as million M has been used to abbreviate both million and thousand (M is the Roman numeral for thousand)	Use million Use thousand
Ng or ng	Nanogram	Mistaken as mg Mistaken as nasogastric	Use nanogram or nanog
U or u**	Unit(s)	Mistaken as zero or the number 4, causing a 10-fold overdose or greater (e.g., 4U seen as 40 or 4u seen as 44) Mistaken as cc, leading to administering volume instead of units (e.g., 4u seen as 4cc)	Use unit(s)
μg	Microgram	Mistaken as mg	Use mcg
Abbreviations for Route of Administration			
AD, AS, AU	Right ear, left ear, each ear	Mistaken as OD, OS, OU (right eye, left eye, each eye)	Use right ear, left ear, or each ear
IN	Intranasal	Mistaken as IM or IV	Use NAS (all UPPERCASE letters) or intranasal

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IT	Intrathecal	Mistaken as intratracheal, intratumor, intratympanic, or inhalation therapy	Use intrathecal
OD, OS, OU	Right eye, left eye, each eye	Mistaken as AD, AS, AU (right ear, left ear, each ear)	Use right eye, left eye, or each eye
Per os	By mouth, orally	The os was mistaken as left eye (OS, oculus sinister)	Use PO, by mouth, or orally
SC, SQ, sq, or sub q	Subcutaneous(ly)	SC and sc mistaken as SL or sl (sublingual) SQ mistaken as "5 every" The q in sub q has been mistaken as "every"	Use SUBQ (all UPPERCASE letters, without spaces or periods between letters) or subcutaneous(ly)
Abbreviations for Frequency/Instructions for Use			
HS hs	Half-strength At bedtime, hours of sleep	Mistaken as bedtime Mistaken as half-strength	Use half-strength Use HS (all UPPERCASE letters) for bedtime
o.d. or OD	Once daily	Mistaken as right eye (OD, oculus dexter), leading to oral liquid medications administered in the eye	Use daily
Q.D., QD, q.d., or qd**	Every day	Mistaken as q.i.d., especially if the period after the q or the tail of a handwritten q is misunderstood as the letter i	Use daily
Qhs	Nightly at bedtime	Mistaken as qhr (every hour)	Use nightly or HS for bedtime
Qn	Nightly or at bedtime	Mistaken as qh (every hour)	Use nightly or HS for bedtime
Q.O.D., QOD, q.o.d., or qod**	Every other day	Mistaken as qd (daily) or qid (four times daily), especially if the "o" is poorly written	Use every other day
q1d	Daily	Mistaken as qid (four times daily)	Use daily
q6PM, etc.	Every evening at 6 PM	Mistaken as every 6 hours	Use daily at 6 PM or 6 PM daily
SSRI SSI	Sliding scale regular insulin Sliding scale insulin	Mistaken as selective-serotonin reuptake inhibitor Mistaken as Strong Solution of Iodine (Lugol's)	Use sliding scale (insulin)
TIW or tiw BIW or biw	3 times a week 2 times a week	Mistaken as 3 times a day or twice in a week Mistaken as 2 times a day	Use 3 times weekly Use 2 times weekly
UD	As directed (ut dictum)	Mistaken as unit dose (e.g., an order for "dilTIAZem infusion UD" was mistakenly administered as a unit [bolus] dose)	Use as directed

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Miscellaneous Abbreviations Associated with Medication Use			
BBA	Baby boy A (twin)	B in BBA mistaken as twin B rather than gender (boy)	When assigning identifiers to newborns, use the mother's last name, the baby's gender (boy or girl), and a distinguishing identifier for all multiples (e.g., Smith girl A, Smith girl B)
BGB	Baby girl B (twin)	B at end of BGB mistaken as gender (boy) not twin B	
D/C	Discharge or discontinue	Premature discontinuation of medications when D/C (intended to mean discharge) on a medication list was misinterpreted as discontinued	Use discharge and discontinue or stop
IJ	Injection	Mistaken as IV or intrajugular	Use injection
OJ	Orange juice	Mistaken as OD or OS (right or left eye); drugs meant to be diluted in orange juice may be given in the eye	Use orange juice
Period following abbreviations (e.g., mg., mL.)†	mg or mL	Unnecessary period mistaken as the number 1, especially if written poorly	Use mg, mL, etc., without a terminal period
Drug Name Abbreviations			
To prevent confusion, avoid abbreviating drug names entirely. Exceptions may be made for multi-ingredient drug formulations, including vitamins, when there are electronic drug name field space constraints; however, drug name abbreviations should NEVER be used for any medications on the *ISMP List of High-Alert Medications* (in Acute Care Settings [www.ismp.org/node/103], Community/Ambulatory Settings [www.ismp.org/node/129], and Long-Term Care Settings [www.ismp.org/node/130]). Examples of drug name abbreviations involved in serious medication errors include:			
Antiretroviral medications (e.g., DOR, TAF, TDF)	DOR: doravirine TAF: tenofovir alafenamide TDF: tenofovir disoproxil fumarate	DOR: Dovato (dolutegravir and lamiVUDine) TAF: tenofovir disoproxil fumarate TDF: tenofovir alafenamide	Use complete drug names
APAP	acetaminophen	Not recognized as acetaminophen	Use complete drug name
ARA A	vidarabine	Mistaken as cytarabine ("ARA C")	Use complete drug name
AT II and AT III	AT II: angiotensin II (Giapreza) AT III: antithrombin III (Thrombate III)	AT II (angiotensin II) mistaken as AT III (antithrombin III) AT III (antithrombin III) mistaken as AT II (angiotensin II)	Use complete drug names
AZT	zidovudine (Retrovir)	Mistaken as azithromycin, azaTHIOprine, or aztreonam	Use complete drug name
CPZ	Compazine (prochlorperazine)	Mistaken as chlorpro**MAZINE**	Use complete drug name
DTO	diluted tincture of opium or deodorized tincture of opium (Paregoric)	Mistaken as tincture of opium	Use complete drug name

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HCT	hydrocortisone	Mistaken as hydro**CHLORO**thiazide	Use complete drug name
HCTZ	hydro**CHLORO**thiazide	Mistaken as hydrocortisone (e.g., seen as HCT250 mg)	Use complete drug name
MgSO4**	magnesium sulfate	Mistaken as morphine sulfate	Use complete drug name
MS, MSO4**	morphine sulfate	Mistaken as magnesium sulfate	Use complete drug name
MTX	methotrexate	Mistaken as mito**XANTRONE**	Use complete drug name
Na at the beginning of a drug name (e.g., Na bicarbonate)	Sodium bicarbonate	Mistaken as no bicarbonate	Use complete drug name
NoAC	novel/new oral anticoagulant	Mistaken as no anticoagulant	Use complete drug name
OXY	oxytocin	Mistaken as oxy**CODONE**, Oxy**CONTIN**	Use complete drug name
PCA	procainamide	Mistaken as patient-controlled analgesia	Use complete drug name
PIT	Pitocin (oxytocin)	Mistaken as Pitressin, a discontinued brand of vasopressin still referred to as PIT	Use complete drug name
PNV	prenatal vitamins	Mistaken as penicillin VK	Use complete drug name
PTU	propylthiouracil	Mistaken as Purinethol (mercaptopurine)	Use complete drug name
T3	Tylenol with codeine No. 3	Mistaken as liothyronine, which is sometimes referred to as T3	Use complete drug name
TAC or tac	triamcinolone or tacrolimus	Mistaken as tetracaine, Adrenalin, and cocaine; or as Taxotere, Adriamycin, and cyclophosphamide	Use complete drug names Avoid drug regimen or protocol acronyms that may have a dual meaning or may be confused with other common acronyms, even if defined in an order set
TNK	TNKase	Mistaken as TPA	Use complete drug name
TPA or tPA	tissue plasminogen activator, Activase (alteplase)	Mistaken as TNK (TNKase, tenecteplase), TXA (tranexamic acid), or less often as another tissue plasminogen activator, Retavase (retaplase)	Use complete drug names
TXA	tranexamic acid	Mistaken as TPA (tissue plasminogen activator)	Use complete drug name
ZnSO4	zinc sulfate	Mistaken as morphine sulfate	Use complete drug name
Stemmed/Coined Drug Names			
Nitro drip	nitroglycerin infusion	Mistaken as nitroprusside infusion	Use complete drug name
IV vanc	Intravenous vancomycin	Mistaken as Invanz	Use complete drug name
Levo	levofloxacin	Mistaken as Levophed (norepinephrine)	Use complete drug name

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Neo	Neo-Synephrine, a well known but discontinued brand of phenylephrine	Mistaken as neostigmine	Use complete drug name
Coined names for compounded products (e.g., magic mouthwash, banana bag, GI cocktail, half and half, pink lady)	Specific ingredients compounded together	Mistaken ingredients	Use complete drug/product names for all ingredients Coined names for compounded products should only be used if the contents are standardized and readily available for reference to prescribers, pharmacists, and nurses
Number embedded in drug name (not part of the official name) (e.g., 5-fluorouracil, 6-mercaptopurine)	fluorouracil mercaptopurine	Embedded number mistaken as the dose or number of tablets/capsules to be administered	Use complete drug names, without an embedded number if the number is not part of the official drug name
Dose Designations and Other Information			
1/2 tablet	Half tablet	1 or 2 tablets	Use text (half tablet) or reduced font-size fractions (½ tablet)
Doses expressed as Roman numerals (e.g., V)	5	Mistaken as the designated letter (e.g., the letter V) or the wrong numeral (e.g., 10 instead of 5)	Use only Arabic numerals (e.g., 1, 2, 3) to express doses
Lack of a leading zero before a decimal point (e.g., .5 mg)**	0.5 mg	Mistaken as 5 mg if the decimal point is not seen	Use a leading zero before a decimal point when the dose is less than one measurement unit
Trailing zero after a decimal point (e.g., 1.0 mg)**	1 mg	Mistaken as 10 mg if the decimal point is not seen	Do not use trailing zeros for doses expressed in whole numbers
Ratio expression of a strength of a single-entity injectable drug product (e.g., EPINEPHrine 1:1,000; 1:10,000; 1:100,000)	1:1,000: contains 1 mg/mL 1:10,000: contains 0.1 mg/mL 1:100,000: contains 0.01 mg/mL	Mistaken as the wrong strength	Express the strength in terms of quantity per total volume (e.g., EPINEPHrine 1 mg per 10 mL) Exception: combination local anesthetics (e.g., lidocaine 1% and EPINEPHrine 1:100,000)
Drug name and dose run together (problematic for drug names that end in the letter l [e.g., propranolol20 mg; TEGretol300 mg])	propranolol 20 mg TEGretol 300 mg	Mistaken as propranolol 120 mg Mistaken as TEGretol 1300 mg	Place adequate space between the drug name, dose, and unit of measure
Numerical dose and unit of measure run together (e.g., 10mg, 10Units)	10 mg 10 mL	The m in mg, or U in Units, has been mistaken as one or two zeros when flush against the dose (e.g., 10mg, 10Units), risking a 10- to 100-fold overdose	Place adequate space between the dose and unit of measure

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Large doses without properly placed commas (e.g., 100000 units; 1000000 units)	100,000 units 1,000,000 units	100000 has been mistaken as 10,000 or 1,000,000 1000000 has been mistaken as 100,000	Use commas for dosing units at or above 1,000 or use words such as 100 thousand or 1 million to improve readability **Note:** Use commas to separate digits only in the US; commas are used in place of decimal points in some other countries
Symbols			
ℨ or ♏†	Dram Minim	Symbol for dram mistaken as the number 3 Symbol for minim mistaken as mL	Use the metric system
x1	Administer once	Administer for 1 day	Use explicit words (e.g., for 1 dose)
> and <	More than and less than	Mistaken as opposite of intended Mistakenly have used the incorrect symbol < mistaken as the number 4 when handwritten (e.g., <10 misread as 40)	Use more than or less than
↑ and ↓†	Increase and decrease	Mistaken as opposite of intended Mistakenly have used the incorrect symbol ↑ mistaken as the letter T, leading to misinterpretation as the start of a drug name, or mistaken as the numbers 4 or 7	Use increase and decrease
/ (slash mark)†	Separates two doses or indicates per	Mistaken as the number 1 (e.g., 25 units/10 units misread as 25 units and 110 units)	Use per rather than a slash mark to separate doses
@†	At	Mistaken as the number 2	Use at
&†	And	Mistaken as the number 2	Use and
+†	Plus or and	Mistaken as the number 4	Use plus, and, or in addition to
°	Hour	Mistaken as a zero (e.g., q2° seen as q20)	Use hr, h, or hour
Φ or ⌀†	Zero, null sign	Mistaken as the numbers 4, 6, 8, and 9	Use 0 or zero, or describe intent using whole words
#	Pound(s)	Mistaken as a number sign	Use the metric system (kg or g) rather than pounds Use lb if referring to pounds

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Apothecary or Household Abbreviations			
Explicit apothecary or household measurements may **ONLY** be safely used to express the directions for mixing dry ingredients to prepare topical products (e.g., dissolve 2 capfuls of granules per gallon of warm water to prepare a magnesium sulfate soaking aid). Otherwise, metric system measurements should be used.			
gr	Grain(s)	Mistaken as gram	Use the metric system (e.g., mcg, g)
dr	Dram(s)	Mistaken as doctor	Use the metric system (e.g., mL)
min	Minim(s)	Mistaken as minutes	Use the metric system (e.g., mL)
oz	Ounce(s)	Mistaken as zero or 0_2	Use the metric system (e.g., mL)
tsp	Teaspoon(s)	Mistaken as tablespoon(s)	Use the metric system (e.g., mL)
tbsp or Tbsp	Tablespoon(s)	Mistaken as teaspoon(s)	Use the metric system (e.g., mL)

Common Abbreviations with Contradictory Meanings	Contradictory Meanings	Correction
For additional information and tables from Neil Davis (MedAbbrev.com) containing additional examples of abbreviations with contradictory or ambiguous meanings, please visit: www.ismp.org/ext/638.		
B	Breast, brain, or bladder	Use breast, brain, or bladder
C	Cerebral, coronary, or carotid	Use cerebral, coronary, or carotid
D or d	Day or dose (e.g., parameter-based dosing formulas using D or d [mg/kg/d] could be interpreted as either day or dose [mg/kg/day or mg/kg/dose]; or x3d could be interpreted as either 3 days or 3 doses)	Use day or dose
H	Hand or hip	Use hand or hip
I	Impaired or improvement	Use impaired or improvement
L	Liver or lung	Use liver or lung
N	No or normal	Use no or normal
P	Pancreas, prostate, preeclampsia, or psychosis	Use pancreas, prostate, preeclampsia, or psychosis
S	Special or standard	Use special or standard
SS or ss	Single strength, sliding scale (insulin), signs and symptoms, or ½ (apothecary) SS has also been mistaken as the number 55	Use single strength, sliding scale, signs and symptoms, or one-half or ½

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While the abbreviations, symbols, and dose designations in the **Table** should **NEVER** be used, not allowing the use of **ANY** abbreviations is exceedingly unlikely. Therefore, the person who uses an organization-approved abbreviation must take responsibility for making sure that it is properly interpreted. If an uncommon or ambiguous abbreviation is used, and it should be defined by the writer or sender. Where uncertainty exists, clarification with the person who used the abbreviation is required.

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