



Safety Briefs

•Orders for **COLAZAL** (balsalazide), a drug used to treat mild to moderate ulcerative colitis, could easily be confused with the antipsychotic **CLOZARIL** (clozapine). Colazal is available as a 750 mg tablet to be taken three times daily. It is metabolized in the gut to mesalamine (5-aminosalicylic acid) and is contraindicated in patients who are hypersensitive to salicylates. Clozaril is available in 25 mg and 100 mg tablet strengths, but dosing can range as high as 900 mg a day, which can overlap the tablet strength of Colazal. Also, orders for Clozaril 75 mg, written improperly with a terminal zero (75.0 mg) increase the chance of a mix-up. Clozaril is associated with numerous contraindications and significant risks, including agranulocytosis. A mix-up between these drugs could be dangerous, making it critical to communicate the medication's purpose on all prescriptions for either drug. We also recommend installing alerts in your computer and applying auxiliary labels to the drug containers.

•The World Health Organization, the International Union Against Tuberculosis and Lung Disease, and the Centers for Disease Control recommend the use of **RIFAMATE** (300 mg rifampin and 150 mg isoniazid) for the treatment of tuberculosis. The reason for this recommendation is to prevent patients from taking a single drug that leads to drug resistance. Unfortunately, the name Rifamate is very similar to the name rifampin. Consequently, mistakes have been made and patients have been given rifampin when Rifamate was ordered. This monotherapy leads to resistance to rifampin, one of the most valuable drugs we have for the treatment of TB. Although there are few formal reports in national error reporting program databases, one physician who recently contacted us mentioned an informal survey that he conducted among several of his medical and nursing colleagues in pulmonary medicine. These physicians and nurses recalled over 25 instances when patients have mistakenly been given rifampin when Rifamate was ordered. Although the company is aware of the problem, they have not agreed to change the brand name since only a handful of cases have been reported formally. However, since rifampin resistance might be considered a major public health problem, we believe it is very reasonable for FDA to proceed with epidemiological studies to estimate the extent of the problem and needed action. In the meantime, please alert inpatient and outpatient staff about the potential for medication errors and take other appropriate steps, previously listed in our publications, to reduce the likelihood of confusion between similarly named products.

•The US Senate Health, Education, Labor & Pensions Committee will hold hearings on May 24th to discuss new bipartisan legislation to promote voluntary reporting and quality improvement. The legislation includes the creation of a national patient safety center at the Agency for Health Research and Quality, and will offer confidentiality protection for data sent to error reporting programs.

Please don't sleep through this wake-up call

Last week, another headline-grabbing medication error in the *Washington Post* captured the attention of many as a story unfolded about an unseen decimal point that led to the tragic death of a 9-month-old baby girl just one week earlier. The baby's physician had prescribed morphine ".5 mg" IV for the management of post-operative pain. However, a unit secretary did not see the decimal point and transcribed the order by hand onto a medication administration record (MAR) as "5 mg." An experienced nurse followed the directions on the MAR without question and gave the baby 5 mg of IV morphine initially and another 5 mg dose two hours later. About four hours after the second dose, the baby stopped breathing and suffered a cardiac arrest. In our November 15, 2000 issue, we described a hauntingly similar error where an infant received a fatal dose of morphine after the prescribed dose of ".5 mg" was misread as 5 mg.

There's another painful truth to bring to light in this case as tragic and intolerable as the death of a baby. The primary cause of this error - expression of a decimal dose without a leading zero - is one of the first medication safety issues ever published by ISMP over 25 years ago! Yet today, misinterpretation of naked decimal points and other dangerous dose expressions and abbreviations continue to shatter the lives of innocent patients, their families, and unsuspecting health providers who have made tragic mistakes.

A steady stream of reported errors due to misinterpreting a handful of dangerous dose expressions and abbreviations has led ISMP to repeatedly recommend abandoning their use for almost three decades. Others have joined ISMP in advocating this important error reduction step. For example, in 1996, the first recommendations issued from the National Coordinating Council for Medication Errors Reporting and Prevention (NCCMERP) were aimed at establishing safe prescribing practices through avoidance of a short list of dangerous abbreviations and dose expressions (including naked decimal points).

ISMP has often stressed that it's equally important to avoid these dangerous abbreviations and dose expressions in other communications such as computer-generated labels, MARs, labels for drug storage bins/shelves, preprinted orders and protocols, and pharmacy and prescriber computer order entry screens. For example, it could be argued that computerized prescriber order entry (CPOE) could have prevented the tragic death described above through clear communication of the prescribed dose. However, many computer systems display drug doses using naked decimal points or trailing zeros, and use dangerous abbreviations such as QD and U. Thus, misinterpretation of an order is still a very real possibility with CPOE when these dangerous forms of communication are used.

In addition, we have consistently urged the pharmaceutical industry and FDA to avoid the use of dangerous abbreviations and dose expressions on medication labeling, packaging, and advertisements. But you've seen our many reports of both new and older products on the market with confusing labeling and packaging, and the many ads for pharmaceutical products that depict shortcuts in prescribing and dangerous ways of expressing doses that set poor examples for all health professionals, despite an FDA approval process.

Let this baby's death be the last wake up call we need. It's time for the healthcare workforce, medical product vendors, the pharmaceutical industry, regulatory and accrediting bodies, and professional training programs to adopt and enforce the prohibition of knowingly dangerous ways of communicating information about medications. A table of dangerous abbreviations and dose expressions most often associated with misinterpretation and patient harm (as reported to the USP-ISMP Medication Errors Reporting Program) appears on the following two pages. Please everyone, use it wisely.

SPECIAL ISSSUE - do not use these dangerous abbreviations or dose designations

Abbreviation/ Dose Expression	Intended Meaning	Misinterpretation	Correction
Apothecary symbols	dram minim	Misunderstood or misread (symbol for dram misread for “3” and minim misread as “mL”).	Use the metric system.
AU	aurio uterque (each ear)	Mistaken for OU (oculo uterque—each eye).	Don’t use this abbreviation.
D/C	discharge discontinue	Premature discontinuation of medications when D/C (intended to mean “discharge”) has been misinterpreted as “discontinued” when followed by a list of drugs.	Use “discharge” and “discontinue.”
Drug names ARA-A AZT CPZ DPT HCl HCT HCTZ MgSO ₄ MSO ₄ MTX TAC ZnSO ₄	vidarabine zidovudine (RETROVIR) COMPAZINE (prochlorperazine) DEMEROL- PHENERGAN- THORAZINE hydrochloric acid hydrocortisone hydrochlorothiazide magnesium sulfate morphine sulfate morphine sulfate methotrexate triamcinolone zinc sulfate	cytarabine (ARA-C) azathioprine chlorpromazine diphtheria-pertussis-tetanus (vaccine) potassium chloride (The “H” is misinterpreted as “K.”) hydrochlorothiazide hydrocortisone (seen as HCT250 mg) morphine sulfate magnesium sulfate mitoxantrone tetracaine, ADRENALIN , cocaine morphine sulfate	Use the complete spelling for drug names.
Stemmed names “Nitro” drip “Norflox”	nitroglycerin infusion norfloxacin	sodium nitroprusside infusion NORFLEX (orphenadrine)	
µg	microgram	Mistaken for “mg” when handwritten.	Use “mcg.”
o.d. or OD	once daily	Misinterpreted as “right eye” (OD—oculus dexter) and administration of oral medications in the eye.	Use “daily.”
TIW or tiw	three times a week.	Mistaken as “three times a day.”	Don’t use this abbreviation.
per os	orally	The “os” can be mistaken for “left eye.”	Use “PO,” “by mouth,” or “orally.”
q.d. or QD	every day	Mistaken as q.i.d., especially if the period after the “q” or the tail of the “q” is misunderstood as an “i.”	Use “daily” or “every day.”
qn	nightly or at bedtime	Misinterpreted as “qh” (every hour).	Use “nightly.”
qhs	nightly at bedtime	Misread as every hour.	Use “nightly.”

SPECIAL ISSUE - do not use these dangerous abbreviations or dose designations (cont'd)

Abbreviation/ Dose Expression	Intended Meaning	Misinterpretation	Correction
q6PM, etc.	every evening at 6 PM	Misread as every six hours.	Use 6 PM "nightly."
q.o.d. or QOD	every other day	Misinterpreted as "q.d." (daily) or "q.i.d." (four times daily) if the "o" is poorly written.	Use "every other day."
sub q	subcutaneous	The "q" has been mistaken for "every" (e.g., one heparin dose ordered "sub q 2 hours before surgery" misunderstood as every 2 hours before surgery).	Use "subcut." or write "subcutaneous."
SC	subcutaneous	Mistaken for SL (sublingual).	Use "subcut." or write "subcutaneous."
U or u	unit	Read as a zero (0) or a four (4), causing a 10-fold overdose or greater (4U seen as "40" or 4u seen as 44").	"Unit" has no acceptable abbreviation. Use "unit."
IU	international unit	Misread as IV (intravenous).	Use "units."
cc	cubic centimeters	Misread as "U" (units).	Use "mL."
x3d	for three days	Mistaken for "three doses."	Use "for three days."
BT	bedtime	Mistaken as "BID" (twice daily).	Use "hs."
ss	sliding scale (insulin) or ½ (apothecary)	Mistaken for "55."	Spell out "sliding scale." Use "one-half" or use "½."
> and <	greater than and less than	Mistakenly used opposite of intended.	Use "greater than" or "less than."
/ (slash mark)	separates two doses or indicates "per"	Misunderstood as the number 1 ("25 unit/10 units" read as "110" units).	Do not use a slash mark to separate doses. Use "per."
Name letters and dose numbers run together (e.g., Inderal40 mg)	Inderal 40 mg	Misread as Inderal 140 mg.	Always use space between drug name, dose and unit of measure.
Zero after decimal point (1.0)	1 mg	Misread as 10 mg if the decimal point is not seen.	Do not use terminal zeros for doses expressed in whole numbers.
No zero before decimal dose (.5 mg)	0.5 mg	Misread as 5 mg.	Always use zero before a decimal when the dose is less than a whole unit.