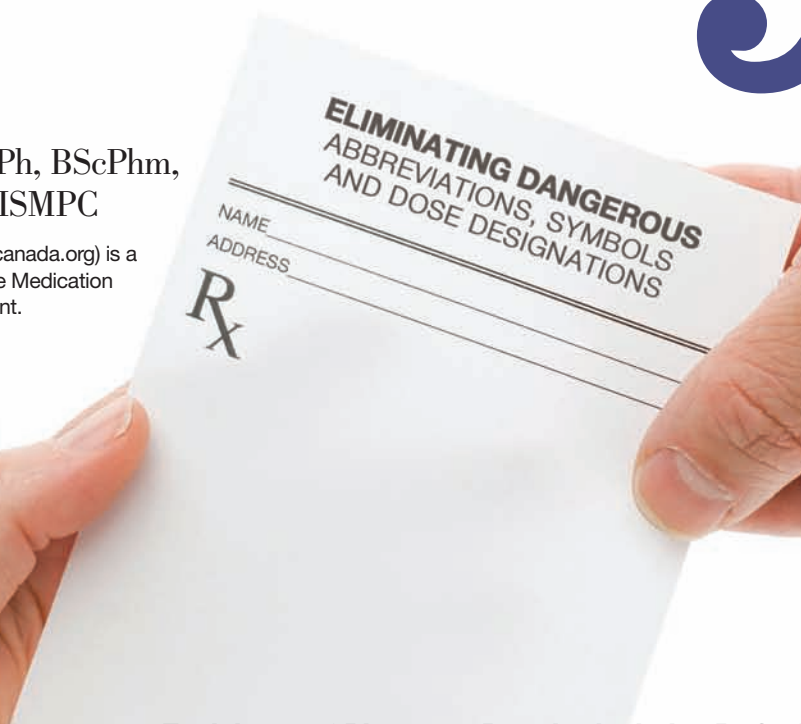


Prescription for safety

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Each issue of *Pharmacy Practice* includes *Rx for Error*, which provides an example of a “difficult-to-read” prescription. It’s a reminder that pharmacists and other healthcare practitioners are often faced with situations where it is difficult to ensure correct interpretation of the prescriber’s intent. Legibility of prescriptions is a recurring theme when medication incidents are analyzed and often involves the use of abbreviations, symbols and dose designations that are misinterpreted.

A book by Neil Davis, published in 2007, identifies 28,000 medical abbreviations in common use.¹ This is more than a tenfold increase since publication of the first edition of the book (in 1985), which included 2,300 abbreviations. Davis comments that “Abbreviations are a convenience, a time saver and a way of avoiding the possibility of misspelling words. However, a price can be paid for their use: their use lengthens the time needed to train individuals in the health fields, wastes the time of healthcare

workers in tracking down their meaning, at times delays the patient's care and occasionally results in patient harm."¹

Early physicians were taught Latin and Greek, and use of written instructions in these languages became part of the mystery of early medical practice. Furthermore, physicians were among the privileged few who could read and write. Over many centuries, a medical shorthand of abbreviations of Latin and Greek terms developed. For example, "QD" is abbreviated from the Latin "quaque die," meaning "every day." It is used as a prescription direction for daily administration of medications. The Greek letter delta (δ), commonly symbolized by a triangle (Δ), is used to indicate "change" and the "@" symbol is thought to be derived from the Greek "ana," meaning "at the rate of."²

Misinterpreted abbreviations

The Institute for Safe Medication Practices Canada (ISMP Canada) and the Institute for Safe Medication Practices (ISMP) in the U.S. have received numerous reports of medication incidents resulting from misinterpretation of abbreviations, symbols and dose designations. Misinterpretation of abbreviations occurs through a phenomenon called "confirmation bias," in which we look for information that confirms our expectations, rather than information that contradicts what we might expect.

The following two examples (used with permission from ISMP Canada) were included in an ISMP Canada bulletin published in 2005.³

60 Regular INSULIN

The "u," intended to indicate "units," has often been misinterpreted as a "0" (zero), leading to tenfold dosing errors. In this case, the "6u" was interpreted as "60," and the patient received 60 units of regular (short-acting) insulin, rather than the intended six units.

herp L103 Jm.

Abbreviation of drug names increases the likelihood of confusion between look-alike

and sound-alike names. In the example shown above, although the order was verbally communicated as "morphine 10 mg," the common practice of abbreviating drug names was found to be a contributing factor in a fatal incident where hydromorphone was administered instead of morphine.

In addition, the ISMP Canada medication incident database contains reports of levofloxacin, digoxin and ramipril administered four times daily instead of once daily due to misinterpretation of "QD" as "QID."

Initiatives to eliminate use of dangerous abbreviations

To eliminate the use of dangerous abbreviations, symbols and dose designations, those known to be problematic must be

identified, and information regarding their potential to cause medication incidents must be widely disseminated. In 2006, ISMP Canada recognized the need for a Canadian reference list and proposed 13 dangerous terms and symbols (Figure 1). This list was intended to provide a starting point for elimination of these terms from communications about medications. The abbreviations included in this list have been implicated in medication incidents causing harm to patients, although others are also known to have been misinterpreted. ISMP Canada, the Canadian Patient Safety Institute and the Canadian Council on Health Services Accreditation are collaborating to raise awareness about the need to eliminate use of these abbreviations, symbols and dose designations to enhance patient safety. Seven-

figure 1

Do Not Use

Dangerous Abbreviations, Symbols and Dose Designations

The abbreviations, symbols, and dose designations found in this table have been reported as being frequently misinterpreted and involved in harmful medication errors. They should NEVER be used when communicating medication information.


Abbreviation	Intended Meaning	Problem	Correction
U	unit	Mistaken for "0" (zero), "4" (four), or cc.	Use "unit".
IU	international unit	Mistaken for "IV" (intravenous) or "10" (ten).	Use "unit".
Abbreviations for drug names		Misinterpreted because of similar abbreviations for multiple drugs; e.g., MS, MSO ₄ (morphine sulphate), MgSO ₄ (magnesium sulphate) may be confused for one another.	Do not abbreviate drug names.
QD QOD	Every day Every other day	QD and QOD have been mistaken for each other, or as 'qid'. The Q has also been misinterpreted as "2" (two).	Use "daily" and "every other day".
OD	Every day	Mistaken for "right eye" (OD = oculus dexter).	Use "daily".
OS, OD, OU	Left eye, right eye, both eyes	May be confused with one another.	Use "left eye", "right eye" or "both eyes".
D/C	Discharge	Interpreted as "discontinue whatever medications follow" (typically discharge medications).	Use "discharge".
cc	cubic centimetre	Mistaken for "u" (units).	Use "mL" or "millilitre".
µg	microgram	Mistaken for "mg" (milligram) resulting in one thousand-fold overdose.	Use "mcg".
Symbol	Intended Meaning	Potential Problem	Correction
@	at	Mistaken for "2" (two) or "5" (five).	Use "at".
> <	Greater than Less than	Mistaken for "7" (seven) or the letter "L". Confused with each other.	Use "greater than"/"more than" or "less than"/"lower than".
Dose Designation	Intended Meaning	Potential Problem	Correction
Trailing zero	.X mg	Decimal point is overlooked resulting in 10-fold dose error.	Never use a zero by itself after a decimal point. Use "X mg".
Lack of leading zero	.X mg	Decimal point is overlooked resulting in 10-fold dose error.	Always use a zero before a decimal point. Use "0.X mg".

Adapted from ISMP's List of Error-Prone Abbreviations, Symbols, and Dose Designations 2006

Report actual and potential medication errors to ISMP Canada via the web at https://www.ismp-canada.org/err_report.htm or by calling 1-866-54-ISMPC. ISMP Canada guarantees confidentiality of information received and respects the reporter's wishes as to the level of detail included in publications.

ISMP Canada July 2006

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Institute for Safe Medication Practices Canada
 Institut pour l'évaluation sécuritaire des médicaments du Canada

ral national initiatives related to dangerous abbreviations have been undertaken by organizations in the U.S., including ISMP,⁴ the Joint Commission on Accreditation of Healthcare Organizations [JCAHO],⁵ the National Coordinating Council for Medication Error Reporting and Prevention⁶ and the United States Pharmacopeia.⁷

Although incidents related to the use of dangerous abbreviations and unclear dose

designations have commonly involved handwritten prescriptions or medication administration documents, it is necessary to eliminate use of these terms and symbols from *all* documentation involved in the medication use process. This includes all pharmacy-generated labelling and packaging, computer-order entry screens, and electronic and computer-generated medication administration records.

table 1

How pharmacists can help eliminate dangerous abbreviations

Prominently post the ISMP Canada *Do Not Use* list in your workplace and disseminate it to other practitioners with whom you are in regular contact. (The ISMP Canada Medication Safety Bulletin *Eliminate Use of Dangerous Abbreviations, Symbols and Dose Designations* is available online at www.ismp-canada.org/download/ISMPCSB2006-04Aabbr.pdf).

- Share examples of incidents that have resulted from misinterpretation of dangerous abbreviations with pharmacy staff and other practitioners.
- Avoid the use of abbreviations in all handwritten communications in the pharmacy. Write instructions in full (e.g., “daily” instead of “QD,” “units” instead of “U”).
- Contact prescribers directly to clarify all orders where the directions are not clear.
- Review all pharmacy-generated labelling, packaging and electronic or computer-generated medication administration records for inadvertent use of dangerous abbreviations, symbols and dose designations.
- Assess use of dangerous abbreviations in computer information systems prior to purchase, and work with system vendors to make software changes to eliminate abbreviations, symbols and dose designations from order entry fields.
- Provide education for all pharmacy support staff and students about the importance of clear and legible communication and the need to avoid abbreviations to ensure patient safety.
- Educate patients about the potential for unclear prescriptions to be misinterpreted and the need for patients to review their prescriptions with the prescriber. As healthcare practitioners in all settings move towards including patients as partners in care, the continued use of prescription abbreviations, symbols and dose designations does little to assist patients in understanding the written instructions on their prescriptions and perpetuates the “mystery of medicine.”
- Report and review all medication incidents and near misses (those involving dangerous abbreviations, as well as others) within the pharmacy and with other members of the healthcare team where possible, to assess opportunities to enhance safety of the medication use system. Pharmacists are also encouraged to report medication incidents and near misses to the ISMP Canada Individual Practitioner Reporting program, a component of the Canadian Medication Incident Reporting and Prevention System (CMIRPS).

Report medication incidents and near misses to ISMP Canada:

- (i) through the secure web portal at www.ismp-canada.org/err_report.htm
- (ii) by phone: 416-733-3131 or toll free: 1-866-544-7672

ISMP Canada guarantees confidentiality and security of information received and respects the wishes of the reporter as to the level of detail included in publications. Additional information about the Canadian Medication Incident Reporting and Prevention System is available at: www.ismp-canada.org/cmirms.htm


“Education as a sole strategy for change may not be sufficient...”

The pharmacist's role

Pharmacists interact with other health-care practitioners in their daily work and thus have opportunities to collaborate on the elimination of this medication safety hazard (Table 1). Educational efforts are an important step toward elimination of dangerous abbreviations, symbols and dose designations and have been shown to substantially reduce the use of unsafe terms.^{8,9} However, education as a sole strategy for change may not be sufficient to ensure lasting effects on individual behaviour. Despite the use of creative educational strategies, organizations that have attempted to tackle the issue of dangerous abbreviations solely through dissemination of information, have identified the need for stronger actions, such as nonacceptance of medication orders containing unsafe abbreviations.¹⁰ Sustained behavioural change requires a

multipronged approach, combining educational efforts with other strategies. For example, removing dangerous abbreviations from all pharmacy-generated medication communications will help to ensure that pharmacy processes do not create communication problems related to medication orders.

Conclusion

Pharmacists often feel they are on the “receiving end” of problematic orders; however, their position in the medication-use process also provides opportunities to collaborate with practitioners in other disciplines to reduce patient-care hazards. Elimination of known dangerous abbreviations, symbols and dose designations is a medication safety strategy that will provide immediate benefit through improved understanding of communications related to medication use. 

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