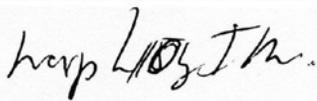
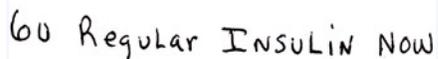


Eliminate Use of Dangerous Abbreviations, Symbols, and Dose Designations

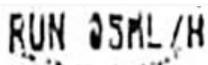
The use of some abbreviations, symbols, and dose designations has been identified as an underlying cause of serious, even fatal medication errors. The following three examples illustrate abbreviations in common use that were involved in medication errors reported to ISMP Canada.



The use of drug name abbreviations increases the likelihood of confusion between drugs with look-alike or sound-alike names. In this example, although the order was also communicated verbally, as “morphine”, the widespread practice of abbreviating drug names (e.g., “morph” for “morphine”) was found to be one of the contributing factors in a fatal event where hydromorphone was given instead of morphine. This example also emphasizes the need for legible handwriting.



The “u”, representing the whole word “units” has often been misinterpreted as a “0” (zero), leading to a 10-fold dose error. Here, the intended “6u” was misinterpreted as “60” and the patient received 60 units of regular (short-acting) insulin. Of note, insulin is the most commonly reported medication identified as causing harm in the ISMP Canada database of voluntarily reported medication errors.¹



In this third example, an octreotide infusion was administered at 25 mL/h instead of 5 mL/h as intended. Whether handwritten or computer-generated, the “@” symbol can be misread as the number “2” or “5”, leading to substantial overdoses of medication.

ISMP Canada, the Canadian Council on Health Services Accreditation, and the Canadian Patient Safety Institute will be undertaking joint initiatives to eliminate the use of dangerous abbreviations, symbols and dose designations in health care to enhance the safety of Canadian patients.

Critical first steps toward eliminating dangerous abbreviations, symbols and dose designations are (i) identifying those known to be prone to errors and (ii) widely disseminating this information. The Hospital Medication Safety Self-Assessment[®] (MSSA), adapted

for use in Canada in 2001, identifies the need for hospitals to establish a list of prohibited, error-prone abbreviations and unacceptable methods of expressing doses.² The ISMP Canada MSSA database with responses from 268 hospitals suggests that many hospitals still need to develop a list of prohibited terms. To date, no definitive Canadian list has been proposed. Several lists have been developed by various organizations in the United States (e.g., the Institute for Safe Medication Practices [ISMP],³ the Joint Commission on Accreditation of Healthcare Organizations [JCAHO],⁴ the National Coordinating Council for Medication Error Reporting and Prevention,⁵ and the United States Pharmacopeia⁶). Of interest, ISMP (US) has recently embarked on a joint campaign with the US Food and Drug Administration (FDA) to eliminate the use of potentially confusing abbreviations by health care professionals, medical students, medical writers, the pharmaceutical industry, and FDA staff.⁷ The campaign references the ISMP “List of Error-Prone Abbreviations, Symbols and Dose Designations”³ and the JCAHO official “Do Not Use” list.⁴

Recognizing the need for a Canadian reference list, ISMP Canada proposes the following minimum list of dangerous abbreviations, symbols, and dose designations as a starting point and proposes that they be eliminated from use by Canadian health care providers. Although other abbreviations are known to have caused errors, those selected for inclusion in this list have been implicated in medication errors causing harm. This list has been adapted from the ISMP (US) list, with consideration of medication errors reported to ISMP Canada.

Most errors related to the use of dangerous abbreviations and unclear dose designations have involved handwritten orders or medication administration records; however, misinterpretation is not limited to handwritten information. These problematic abbreviations and dose designations should be eliminated from *all* documentation involved in the medication use process, including labelling and packaging, preprinted orders and clinical pathways, computer order entry screens, electronic medication administration records, automated dispensing cabinets, and infusion pump screens, as well as pharmaceutical advertising and medication-related articles in health care journals.

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	ℵ.0 mg	Decimal point is overlooked resulting in 10-fold dose error.	Never use a zero by itself after a decimal point. Use "ℵ mg".
Lack of leading zero	.ℵ mg	Decimal point is overlooked resulting in 10-fold dose error.	Always use a zero before a decimal point. Use "0.ℵ 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.



The following recommendations are directed toward specific groups for the elimination of dangerous abbreviations in all clinical documentation associated with medication use and include recommendations from the FDA/ISMP campaign in the US.^{7,8}

Regulatory Agencies and Standards-Setting Organizations

- Endorse the ISMP Canada “Do Not Use Dangerous Abbreviations, Symbols, and Dose Designations” list.

Health Care Professionals

- Avoid the use of abbreviations, particularly those known to be problematic, in all handwritten communications. Write instructions in full, e.g., “daily” instead of “qd”, “units” instead of “u”. Ensure legibility.
- Review and revise all preprinted orders and clinical pathways to ensure that no dangerous abbreviations are present.
- Eliminate the use of dangerous abbreviations from all pharmacy-generated labels and forms.
- Work with computer software vendors to eliminate the use of dangerous abbreviations in health care software applications.
- Provide examples of errors that have resulted from the use of dangerous abbreviations during orientation for all new staff, including physicians.
- Provide education for health care students about abbreviations that should be avoided in practice.
- Complete periodic audits of clinical documentation, and share the results with practitioners to maintain focus on this safety strategy.

Pharmaceutical Industry, Medical Device and Software Manufacturers

- Review labelling and packaging of existing products to check for the use of dangerous abbreviations.
- Ensure that new drug and device applications are free of dangerous abbreviations before submission.
- Eliminate the use of dangerous abbreviations in all product advertising and educational and promotional materials.
- Eliminate dangerous abbreviations from software programming for medical devices.
- Design all automated prescription programs so that unsafe abbreviations are eliminated and safe abbreviations/terms are used by default.

Health Care Communications and Publishing

- Include the ISMP Canada “Do Not Use Dangerous Abbreviations, Symbols, and Dose Designations” list in the instructions for authors and internal publishing style guides for articles related to medication use.

Patients

- Review your prescription with the prescriber. The drug name, dosing information and directions should be legible, written out in full, and understandable.

The elimination of known dangerous abbreviations, symbols, and dose designations is an example of a medication safety initiative that can immediately improve comprehension of medication orders and reduce the likelihood of misinterpretation leading to error. In addition, it is a concrete action that can involve practitioners at all levels, emphasizing the importance of clear communication, and demonstrating the value of learning from reported medication errors.

References:

1. Top ten drugs reported as causing harm. *ISMP Can Saf Bull* 2006 Feb 24;6(1).
2. Hospital Medication Safety Self-Assessment®. Toronto (ON): ISMP Canada; 2001. p. 21.
3. ISMP's list of error-prone abbreviations, symbols and dose designations [Internet]. Huntingdon (PA): Institute for Safe Medication Practices; [cited 2006 May 28]. Available from: <http://www.ismp.org/Tools/abbreviationslist.pdf>
4. Official “Do Not Use” list [Internet]. Oakbrook Terrace (IL): Joint Commission on Accreditation of Healthcare Organizations; [cited 2006 May 9]. Available from: <http://www.jointcommission.org/PatientSafety/DoNotUseList>
5. Recommendations to enhance accuracy of prescription writing [Internet]. Oakbrook Terrace (IL): National Coordinating Council for Medication Error Reporting and Prevention; [cited 2006 Jun 27]. Available from: <http://www.nccmerp.org/council/council1996-09-04.html>
6. Abbreviations can lead to medication errors! *USP Qual Rev* 2004 Jul No.80.
7. FDA and ISMP launch campaign to reduce medication mistakes caused by unclear medical abbreviations. [press release]. Rockville (MD): Food and Drug Administration (US); 2006 Jun 14 [updated 2006 Jun 15; cited 2006 Jun 16]. Available from: <http://www.fda.gov/bbs/topics/NEWS/2006/NEW01390.html>
8. Use caution when “U” abbreviate medical information. Rockville (MD): Food and Drug Administration (US) and Institute for Safe Medication Practices; 2006. Brochure 06-1903. Available from: <http://www.ismp.org/tools/abbreviations/campaignBrochure.pdf>



Canadian Manufacturer Adds Warning to Vial for Neuromuscular Blocking Agent

Hospira is a member of a collaborative initiative led by ISMP Canada to enhance the labelling and packaging of neuromuscular blocking agents in Canada. Pursuant to a consensus on ideal packaging and labelling features for these drugs,¹ Hospira has quickly revised its vial ferrule and cap to include the following content: “Warning: Paralyzing Agent”. ISMP Canada will continue to provide updates on this important collaborative initiative, a first in Canada.

1. Neuromuscular blocking agent labelling and packaging initiative. *ISMP Can Saf Bull* 2006 Apr 25;6(2):2.

Need for Canadian Practitioners to Assist with Review of Proposed Drug Names

With a mission to lower the risk of medication errors, Med-E.R.R.S., (a subsidiary of ISMP [US]), works proactively with pharmaceutical companies to test trademark drug names and package labelling. As part of the process, Med-E.R.R.S. incorporates feedback from health care practitioners regarding the potential for similarity of potential drug names or packages with products currently on the market.

A new Health Canada requirement for manufacturers to test proposed drug names for safety before submission for approval has created an urgent need for Canadian health care providers in active practice (e.g., nurses, pharmacists, physicians) to assist the Med-E.R.R.S. team of professionals to review labels, packaging, and nomenclature. The time commitment for each project is usually 20–30 minutes, and an honorarium is offered to practitioners. ISMP Canada encourages Canadian practitioners to take advantage of this unique opportunity to help make a difference in medication safety. Sign up to “Become a Reviewer” at www.med-errs.com.

2006-2007 JCAHO Update: Requirements Related to Medication Use

Join the ISMP (US) teleconference on August 3 (repeated on August 10) for a 2006-2007 JCAHO Update: Requirements Related to Medication Use.

This session will discuss the revised Medication Management standards for US hospitals starting July 2006, and the 2006 and 2007 JCAHO National Patient Safety Goals (NPSGs), as well as other new standards that affect medication use. In addition, medication-related standards and NPSG requirements that have given hospitals difficulty in 2005-2006 will be discussed, along with strategies for better compliance with them. Lastly, changes in the new unannounced survey process will be presented along with tips on how to best prepare for it the visit.

Visit <http://www.ismp.org/teleconferences/default.asp?teleconferenceID=17> for further details.

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ISMP Canada is a national voluntary medication incident and ‘near miss’ reporting program founded for the purpose of sharing the learning experiences from medication errors. Implementation of preventative strategies and system safeguards to decrease the risk for error-induced injury and thereby promote medication safety in healthcare is our collaborative goal.

To report a medication error to ISMP Canada: (i) visit our website www.ismp-canada.org, or (ii) e-mail us at info@ismp-canada.org, or (iii) phone us at 416-480-4099. ISMP Canada guarantees confidentiality and security of information received. ISMP Canada respects the wishes of the reporter as to the level of detail to be included in our publications.

A Key Partner in the Canadian Medication Incident Reporting and Prevention System