



Expanded Review of the Literature

Abbreviations are part of the culture of communication in healthcare

Many healthcare providers try to be efficient in their communication by using abbreviations or acronyms, inserting symbols, or shortening the names of medications or procedures.⁵ In a fast-paced therapeutic environment the benefits of abbreviations seem obvious – they are convenient, easy and quick to use, space-saving, and hard to misspell.⁵ This is a long-standing practice that is part of the culture of communication between healthcare providers. Historically, physicians, nurses, and pharmacists were taught to use Latin medical terms and their abbreviated forms when writing orders. Today, healthcare providers continue to be taught abbreviations that are relevant to their role. Abbreviation use is reinforced daily in all aspects of patient care, including writing orders, documenting care plans and patient progress, and in communications with the patient.

Abbreviations and acronyms are not universally understood

Some commonly understood abbreviations and acronyms are a useful part of practice (e.g., 'a.m.' for morning or 'AIDS' for acquired immunodeficiency syndrome). Other abbreviations can create a patient safety risk if they are not understood by all healthcare providers or lead to misinterpretation of instructions. Abbreviations may have multiple meanings. Sometimes a special acronym which is understood in only one unit of a hospital or within a speciality is created to represent a process or a medication regimen.⁵ In one study, different healthcare professionals were able to identify an average of 43 per cent of abbreviations and acronyms commonly found in the medical records of surgical patients.⁶ The number of abbreviations identified correctly varied between healthcare professionals depending on the type of abbreviations they typically encountered in their practice.

When medications are involved, misinterpretation of abbreviations can result in use of the wrong drug; missed, extra or incorrect doses; or giving a medication in the incorrect manner.⁵ A study of home care aides providing medication assistance found that only 53 per cent could correctly interpret six abbreviations related to the timing and amount of medication to administer.⁷

Use of abbreviations is widespread

Concerns about abbreviation use initially focused on medication ordering practices of physicians. However the use of abbreviations is widespread and can result in unclear communication when used in other types of documentation.⁷ For example, a nurse may introduce an unapproved abbreviation when transcribing a verbal order or updating a medication administration record. Abbreviations are commonly found in patient progress notes, care plans, and instructions to patients.

- **Clinical or progress notes** – The patient health record is for communicating patient assessments, care decisions, and recommendations to the healthcare team. Clinical notes

need to be comprehensive, accurate, and free of unapproved abbreviations for clarity of communication between those who use the patient health record.^{6,8,9} Health record audits are finding an increasing use of texting abbreviations or acronyms.¹⁰ The use of abbreviations or fragmented language is not prevented by the implementation of an electronic health record; free text entry fields are especially vulnerable to short forms of communication.⁸

Healthcare providers learn about the principles of recording the care of a patient during their course work but typically develop their skills in practice. Education programs, healthcare delivery organizations, and those who mentor students in the clinical setting need to be aware of how abbreviation use is being modeled. Discourage students from using texting and other communication shortcuts in all forms of professional communication, including documentation in the patient health record. If unsafe documentation practices are not corrected, the poor practice will be passed on to trainees and new staff and become a standard, accepted practice.⁸

- **Care plans and patient instructions** – Abbreviations used in the care plan or in instructions provided to the patient or caregiver can put the patient at risk when they return home. Prescription labels and written instructions for patients need to be free of abbreviations. If abbreviations must be used, provide a definition to minimize miscommunication.⁵

Poor handwriting compounds the problem

Poor handwriting increases the risk associated with abbreviation use. In one study, 20 per cent of orders with error-prone abbreviations were deemed illegible.¹¹ When illegible handwriting was a contributing factor to a medication error, the order often included an abbreviation.^{12,13} A study of prescribing errors among community-based providers found that errors related to illegible handwriting were very high (175 errors per 100 prescriptions), followed by errors related to inappropriate abbreviations (13 per 100 prescriptions). The authors concluded that most errors could be prevented by the use of electronic prescribing with clinical decision support.¹⁴ Error-prone abbreviations can also be introduced when an order is transcribed, such as when a verbal order is recorded or orders are copied onto a medication administration record. One study found that fourteen per cent of the errors related to abbreviation use occurred during transcription.¹²

Poor handwriting can also impact communication of information in the progress notes, care plans, or patient assessments when an electronic health record is not used or is incompletely implemented.

Some abbreviations are more likely to result in errors

Nearly five per cent of medication errors reported to a national reporting system (MedMarx) in the United States between 2004 and 2006 were attributed to abbreviation use.¹² A small number of abbreviations were implicated in the majority of abbreviation-related errors (Table 1). The abbreviations implicated in medication errors differed between healthcare professionals (Table 2).

Table 1. Top five abbreviations associated with errors

Abbreviation	Percentage of abbreviation-related errors
QD	43%
U	13%
cc	13%
MS04 or MS	10%
Leading or trailing zeros	4%

Adapted from Brunetti et al., 2007¹²

Table 2. Abbreviation errors by health professional group

Abbreviation	Total errors reported	Percentage of errors by professional group		
		Medicine	Nursing	Pharmacy
SC or SQ	353	90.4	7.1	2
HS	483	87.8	5.2	4.8
cc	2036	83.7	13.3	2.1
QD	5493	81.4	13.7	3.1
U	1606	73.2	20.1	3.6
IU	13	53.8	46.2	0
“stem” medication name	17	58.8	29.4	11.8
TID	72	47.2	27.8	19.4
BID	165	64.2	7.3	21.2
µg	67	49.3	26.9	20.9
d/c or dc	123	56.1	19.5	20.3

Adapted from Brunetti et al., 2007¹²

Research documents the issue and impact of abbreviation use

Evidence from research on the impact of abbreviations will be useful in building a case for an abbreviation initiative. The majority of research has focused on the use of abbreviations by physician prescribers in acute care settings. Studies on the use of abbreviations and prescribing errors in primary care have focused on the potential of electronic prescribing to reduce errors. There is a general lack of research about the impact of abbreviation use in other care settings (continuing care including supportive/assisted living and homecare, and pharmacies) and by non-physician prescribers. See the summary of research describing the problems with abbreviation use.

Patient safety organizations urge limiting abbreviation use

Many patient safety organizations have identified specific abbreviations that are considered error-prone and recommend that steps be taken to limit or eliminate their use. In addition,

Accreditation Canada has a *Required Organizational Practice* related to dangerous abbreviations.⁴ Most of these resources refer to the use of abbreviations in medication orders however the potential risks are much broader.⁶ In general, the use of abbreviations, acronyms, symbols, and dangerous dose designations should be kept to a minimum for safe and effective communication in patient care. Healthcare delivery organizations should establish a list of approved abbreviations with their accepted meaning and a list of abbreviations that are not to be used.^{4,7}

- Accreditation Canada
“Dangerous Abbreviations Required Organizational Practice (ROP)”⁴
<http://www.accreditation.ca/sites/default/files/rop-handbook-2015-en.pdf>
- Institute for Safe Medication Practices Canada (ISMP Canada)
“Do Not Use Dangerous Abbreviations, Symbols and Dose Designations”¹⁵
<https://www.ismp-canada.org/download/ISMPCanadaListOfDangerousAbbreviations.pdf>
- Institute for Safe Medication Practices (ISMP)
“List of Error-Prone Abbreviations, Symbols and Dose Designations”¹⁶
<http://www.ismp.org/tools/errorproneabbreviations.pdf>
- The Joint Commission
“Facts about the Official ‘Do Not Use’ List”¹⁷
http://www.jointcommission.org/facts_about_do_not_use_list/
- National Coordinating Council for Medication Error Reporting and Prevention (NCCMERP)
“Dangerous Abbreviations”¹⁸
<http://www.nccmerp.org/dangerous-abbreviations>
- Australian Commission on Safety and Quality in Healthcare
“Recommendations for Terminology, Abbreviations and Symbols Used in the Prescribing and Administration of Medicines”¹⁹
<http://www.safetyandquality.gov.au/wp-content/uploads/2012/01/32060v2.pdf>

Summary of research describing the problems with abbreviation use

Focus	Description	Findings	Reference
Acute Care	Review of medication errors reported by hospitals to a centralized reporting service in the United States between 2004 and 2006.	Abbreviations were a contributing factor in 5 per cent of all reported errors. Problematic medication name abbreviations and dose expressions were identified.	12
	Audit of the use of error-prone abbreviations and illegibility of handwritten prescriptions.	Of handwritten prescriptions, 27 per cent contained error-prone abbreviations and 17 per cent were illegible.	29

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Focus	Description	Findings	Reference
Acute Care	Audit of abbreviation use in medication records and medication orders in three Australian hospitals.	Over 75 per cent of patients had one or more abbreviations in their medication record. 8.4 per cent of medication orders contained error-prone abbreviations and nearly 30 per cent of these abbreviations had the potential to cause significant harm.	13
Community	Effectiveness of CPOE in reducing errors in a medical clinic.	CPOE reduced the use of inappropriate abbreviations by 94 per cent and illegible orders by 97 per cent.	41
	Effectiveness of CPOE in reducing illegible orders and use of inappropriate abbreviations in medication orders.	Rate of illegible orders and orders with inappropriate abbreviations fell from 12.7 to 0.04 per 100 prescriptions.	42
	Audit of prescribing errors and use of error-prone abbreviations in handwritten prescriptions.	The error rate was 36.7 per 100 prescriptions. Error-prone abbreviations occurred at a rate of 13.1 per 100 prescriptions.	14
	Use of error-prone abbreviations in outpatient medication orders.	43 per cent of orders had at least one abbreviation and 27 per cent of these were shortened medication names. 61 per cent of handwritten prescriptions contained abbreviations compared with only 11 per cent of electronic prescriptions.	65
Health Disciplines	Home care aides' understanding of abbreviations related to medication administration.	53 per cent could correctly interpret six abbreviations related to the timing and amount of medication to administer	8
	Contribution of abbreviation use by different health professionals to medication errors.	Abbreviation use by medical staff, nurses and pharmacists contributed to medication errors. The pattern of abbreviations implicated in medication errors differed between healthcare professionals.	13
	Analysis of dental prescriptions in primary healthcare units in Brazil.	98.3 per cent of prescriptions contained abbreviations.	87

Focus	Description	Findings	Reference
Health Disciplines	Understanding of commonly used medical abbreviations by healthcare providers.	The majority of physicians, nurses and other health care professionals have limited understanding of common medical abbreviations. Recommendations included having a standard list of acceptable abbreviations and a list of ‘Do not use’ abbreviations.	6

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Note: Complete reference list for the Abbreviations Toolkit.

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