

Dangerous and Unapproved Abbreviations at A Joint Commission International Accredited Hospital in Saudi Arabia

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ABSTRACT Background: Abbreviations which resulted in harmful patient errors or death are termed dangerous abbreviations. These abbreviations were included in The Joint Commission "Do Not Use" list of abbreviations launched in May 2005. **Objectives:** The aim of the present study is to assess physicians' and nurses' use of unapproved and dangerous abbreviations and to explore physicians' and nurses' opinion regarding the use of these abbreviations. **Methods:** The study was conducted in a Joint Commission International (JCI) accredited hospital in Eastern Saudi Arabia. Two study designs were used: retrospective descriptive and cross-sectional descriptive. Data were collected through reviewing 384 paper records and distributing a questionnaire to a random sample of 58 physicians and nurses. **Results:** The study revealed that the average number of dangerous abbreviations per record was 2.2 while the average number of unapproved abbreviations per record was 1.96. The most frequent dangerous abbreviation reported in the present study was Discharge/Discontinue D/C accounting for 73% of the total identified dangerous abbreviations for both physicians and nurses. The ability of physicians and nurses to correctly identify the meaning of the most commonly used dangerous abbreviation and unapproved abbreviation ranged between 37.9% and 69.0%. **Conclusions:** The study revealed high use of dangerous and unapproved abbreviations at the study hospital. Few dangerous abbreviations constitute the majority of identified abbreviations. A quality improvement intervention needs to be instituted to reduce abbreviation use at the study hospital.

INTRODUCTION

"Abbreviations" are shortening a word or phrase to a form representing an entire word or phrase while acronyms are derived by grouping letters from several terms. Symbol is something such as an object, picture, written word, a sound, or particular mark that represents something else by association, resemblance, or convention.⁽¹⁾ In medicine, abbreviations are a convenience, a time saver, a space saver, and a way of avoiding the possibility of misspelling words. Abbreviations are so ingrained that health care professionals use them in notes to themselves, casual

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correspondence, and personal to-do lists. Despite their benefits, abbreviations are sometimes not understood or misread or are interpreted incorrectly. Moreover, 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.⁽²⁻⁴⁾

The Joint Commission (TJC) standards require hospitals to standardize abbreviations, acronyms, and symbols that will be used to guide documentation. Organizations create their own standard abbreviations list by performing a careful review of the literature, their own experiences and develop standard abbreviations list with the involvement of physicians. Creating lists of standardized abbreviations, acronyms, and symbols is only the first step. The next step is to ensure that staff complies with the list.⁽⁵⁾ Dangerous abbreviations are also known

as "error-prone abbreviations" or "unsafe abbreviations". They are referred to as "dangerous" because they can be misinterpreted and involved in harmful patient errors or death. Dangerous abbreviations use can lead to errors in medication administration including incorrect dose, incorrect frequency, incorrect route, or even the incorrect drug being given.⁽⁶⁻⁷⁾ In an effort to avoid potential errors of these abbreviations, TJC affirmed its "Do Not Use" list of abbreviations in May 2005 as part of the requirements for meeting National Patient Safety Goal (NPSG) 2B which states that "organizations standardize a list of abbreviations, acronyms, and symbols not to be used throughout the organization". The goal requires organizations to achieve 90% compliance for handwritten documentation.^(5,8-10) Surveys conducted during the first six months of 2005 show that this goal has the highest level of noncompliance among all the National

Patient Safety Goal NPSG requirements.⁽⁵⁾

The Joint Commission "Do Not Use" list represents a minimum requirement and additional items are presented by TJC⁽¹⁰⁾ and other organizations such as The Institute for Safe Medication Practices (ISMP)⁽¹¹⁾ to be considered in expanding beyond TJC minimum list. The present study aimed at assessing physicians' and nurses' use of unapproved and dangerous abbreviations in handwritten notes. Also, physicians' and nurses' opinion regarding the hospital's approved list and dangerous abbreviation list was explored.

METHODOLOGY

The study was conducted at a tertiary care hospital in Eastern Saudi Arabia in 2007. The hospital is over 400-beds covering all major specialties and is accredited by Joint Commission International (JCI). To achieve the objectives of the study, two designs were used: retrospective descriptive study to assess physicians' and nurses' use of

unapproved and dangerous abbreviations in handwritten notes and cross-sectional descriptive study of health care professionals' opinion regarding the hospitals' approved and dangerous abbreviations lists.

I. Assessing physicians' and nurses' use of unapproved and dangerous abbreviations

To assess physicians' and nurses' use of unapproved and dangerous abbreviations, 384 medical records were reviewed. This sample size is based on the following assumptions: A proportion of unapproved abbreviations of 50%, an absolute precision of 5%, and a confidence level of 95%. Records were sampled using random sampling of records from the hospital's Health Information Department. All included records in the study fulfilled four criteria; being inpatient, complete, active records and of 2006 discharges. An abstraction sheet was used to collect medical record number, type of

abbreviation, medical record form where abbreviation is identified, and care giver who issued the abbreviation. The hospital has an approved hospital abbreviation list developed based on a standard medical abbreviation textbook that is updated annually.⁽²⁾ The list is available online through the hospital intranet. Identified abbreviations were compared to the approved hospital abbreviation list and "Don't use list" published by the TJC and The Institute for Safe Medication Practices (ISMP).⁽¹⁰⁻¹¹⁾ Identified abbreviations not found in the approved abbreviation list were categorized into two categories as follows:

1. **Dangerous abbreviation:** included in TJC official or additional "Do Not Use" lists and error-prone abbreviations of the Institute for Safe Medication Practices (ISMP)⁽¹⁰⁻¹¹⁾
2. **Unapproved abbreviation:** abbreviation not included in the hospital abbreviation list.

A number of abbreviations were written

in the reviewed records in a format different from the approved format by hospital. These abbreviations are reported in a separate category titled "different format abbreviation".

II. Physicians' and nurses' opinion regarding approved and dangerous abbreviation lists

Health care providers' opinion regarding approved abbreviation list and dangerous abbreviation lists was sought using a self administered questionnaire. The questionnaire consisted of 12 closed ended questions that addressed 4 domains, namely, familiarity with approved and dangerous abbreviation lists, adequacy of approved list, reasons for using unapproved or dangerous abbreviations, and ability to recognize the correct meaning of frequent abbreviation examples. The questionnaire was handed by the hospital's research coordinator to 37 physicians and 33 nurses who accepted to participate in the study. The response rate

ranged from 78.4% -89.2%. Participation in the survey was anonymous and voluntary.

The research was approved by the hospital's research ethics committee and conducted under the supervision of hospital's research unit. All medical records and survey data are kept confidential and used only for the intended purpose.

RESULTS

A total of 1597 dangerous and unapproved abbreviations were found in the reviewed records (**Table 1**). The mean number of unapproved abbreviations per record was 1.96 while the mean number of dangerous abbreviations per record was 2.2. Only 29.0% of records did not have any dangerous abbreviations. Unapproved abbreviations were commonly found in the interdisciplinary progress notes (49.4%) whereas dangerous abbreviations were commonly found in the clinician's orders (45.6%). Dangerous abbreviations on the Joint commission "Do Not Use" list were 89 abbreviations, of these 76 were found in

clinician's orders and progress notes.

Table 2 shows that (D/C) discharge or discontinue was the most frequent unsafe abbreviation documented by both physicians (60.7%) and nurses (84.6%). Abbreviations belonging to the official Joint Commission "Do Not Use" list constituted 7.3% (30 abbreviations) of dangerous abbreviations documented by physicians and 13.6% (59 abbreviations) of dangerous abbreviations documented by nurses.

Table 3 shows that a total of 621 abbreviations in unapproved format were encountered in the reviewed records. The most frequent unapproved format was v/s accounting for 82.6% followed by BP accounting for 12.1%. Both abbreviations constituted 94.7% of unapproved format.

Table 4 shows that physicians and nurses were almost equal regarding their familiarity with approved abbreviation lists whereas, physicians (72.4%) were less familiar with dangerous abbreviation list than nurses 96.6%. Having insufficient time

for documentation was the most frequent cited reason for using unapproved abbreviations for both physicians (34.5%) and nurses (38.0%). The highest frequency of physicians (14 physicians) and nurses (9 nurses) denied the use of dangerous abbreviations. Being acquainted with the meaning of dangerous abbreviations was the most common reason given by physicians (31.1%) and nurses (24.2%) for using dangerous abbreviations. Nurses had higher proportions than physicians in correctly identifying the meaning of two commonly used abbreviations.

DISCUSSION

The present study examined physicians' and nurses' use of abbreviations in medical records at a Joint Commission accredited hospital in Eastern Saudi Arabia. The study revealed that the average number of dangerous abbreviations per record was 2.2 while the average number of unapproved

abbreviations per record was 1.96. The majority of dangerous and unapproved abbreviations were found in clinician's orders, interdisciplinary progress notes and newborn documentation (Table 1) which increase patients' risks as these notes are directly related to medications.^(5,12) Identified abbreviations belonging to the Joint Commission "Do Not Use list" amounted to 89 abbreviations (Table 2), of these 76 were found in clinician's orders and progress notes. The Joint Commission (TJC) standard of 90% compliance with "Do Not Use list" for all orders and all medication-related documents⁽⁵⁾ was not met at the study hospital (only 29% of records).

The most frequent dangerous abbreviation reported in the present study was D/C accounting for 73% of the total identified dangerous abbreviations for both physicians and nurses (Table 2). D/C is considered dangerous abbreviations because patient's medications have been

prematurely discontinued when “D/C” was intended to mean “discharge” versus “discontinue”.⁽¹¹⁾ Although D/C is not included in the minimum Joint Commission “Do Not Use list”, it has been included in the Institute of Safe Medication Practices list⁽¹¹⁾ and was recommended as an additional dangerous abbreviation in literature.^(13,14) Moreover, D/C has been identified as one of the “Top Ten” most problematic drug or dose abbreviations in a survey conducted at Naval Hospital Naples.⁽¹⁵⁾ The correct interpretation of the intended meaning of D/C was known by approximately 38% of physicians and 50% of nurses at the study hospital. This indicates that the correct meaning of the most frequent dangerous abbreviation is unknown to large percentage of physicians and nurses which aggravates patients’ risks. D/C and four other dangerous abbreviations (Cc, Trailing zero, Drug name and dose run together, Qhs) accounted for approximately 85% (716 out

of a total of 845) of identified dangerous abbreviations written by both nurses and physicians. These five dangerous abbreviations can be the focus of future quality improvement effort to reduce dangerous abbreviations use at the study hospital.

The present study highlighted another problem that is under-reported in the literature which is the use of unapproved formats of abbreviations. The average number of unapproved format amounted to 1.62 abbreviations per reviewed record (Table 3). The use of unapproved format can also be associated with unclear communications and could lead to medication errors. Quality interventions to improve abbreviations use should take this problem into consideration.

At the study hospital, the approved abbreviations and “Do Not Use” lists are distributed to physicians and nurses by email and handed to them during pre-employment orientation course and on the

first day of joining departments. This results in familiarity of physicians and nurses with both approved abbreviation and "Do Not Use" lists (Table 4). However, familiarity was not associated with high compliance, which points to the importance of motivational and controlling mechanisms to enhance compliance with abbreviation standards. Several studies reported the need for creative methods, in addition to education, to reduce dangerous abbreviation use.^(4,16-19) Of these, a study reported significant reduction in the use of dangerous abbreviations following a two step intervention which were education followed by a protocol not to dispense drugs in orders containing dangerous abbreviations.⁽¹⁹⁾

Limitations of the study include small sample size of interviewed physicians and nurses which may have affected the ability to generalize the obtained responses. Based on the results of the present study, it

can be recommended to initiate a quality improvement project that utilizes the Joint Commission suggested methods and innovative methods to reduce the high use of abbreviations at the study hospital. The identified five most common dangerous abbreviations should be the focus of the intervention.

CONCLUSION

The present study revealed high use of dangerous and unapproved abbreviations by physicians and nurses at the study hospital. Few dangerous abbreviations constitute the majority of identified abbreviations. High percentage of surveyed physicians and nurses were unaware about the correct meaning of the most frequent dangerous and unapproved abbreviations. A quality improvement intervention that utilizes creative methods, in addition to education, needs to be instituted to reduce abbreviation use at the study hospital.

Table 1: Distribution of dangerous and unapproved abbreviations according to medical record form

Medical record form	Dangerous		Unapproved	
	No.	%	No.	%
Clinician's orders	385	45.6	265	35.2
Interdisciplinary progress notes	191	22.6	371	49.4
Newborn assessment form	239	28.2	74	9.8
Emergency room form	8	1.0	29	3.9
Discharge summary	19	2.2	7	0.9
Other forms	3	0.4	6	0.8
Total	845	100.0	752	100
Mean abbreviations per record	2.2		1.96	

Table 2: Distribution of dangerous abbreviations according to healthcare provider

Abbreviation	Meaning	Physician		Nurses	
		No.	%	No.	%
D/C	Discharge or discontinue	249	60.7	368	84.6
Cc	Cubic centimeters	58	14.1	3	0.7
Trailing zero*	Zero after decimal point(1.0)	22	5.4	29	6.7
Drug name and dose run together	Example: Plasil10mg Meaning: Plasil 10 mg	29	7.1	0	0.0
Qhs	Nightly at bedtime	19	4.6	0	0.0
Lack of leading zero*	No zero before decimal point (.5)	0	0.0	15	3.4
Q4PM / Q6AM	Every evening at 4 pm/ Every 6 AM	16	3.9	0	0.0
U*	Unit	8	2.0	8	1.8
Q.D*	Once daily	0	0.0	7	1.6
Sc	Subcutaneous	6	1.5	0	0.0
Other		3	0.7	5	1.2
Total		410	100.0	435	100.0

* On the official Joint commission (TJC) "Do Not Use" list

Table 3: Unapproved abbreviations format identified in reviewed records

Unapproved abbreviation	Meaning	Standard format	No.	%
v/s	Vital signs	Vs	513	82.6
BP	Blood pressure	B/P	75	12.1
B/D	Bile duct	BD	9	1.5
Y.O	Year old	YO	5	0.8
Wp	Weakly positive	WP	5	0.8
P.R	Per rectal	P/R	4	0.6
p.o	period of onset	Po	3	0.5
G.A.	General anaesthesia	G/A	3	0.5
F/V	Fetal vaccinia	FV	2	0.3
D/E	Dialysis encephalopathy	DE	2	0.3

Table 4: Physicians and nurses opinion regarding unapproved and dangerous abbreviation lists

	Physician N= 29		Nurse n=29	
	No	%	No	%
Familiarity with approved abbreviation list				
Yes	26	89.7	27	93.1
No	3	10.3	2	6.9
Adequacy of approved abbreviation list				
Include all common abbreviation	12	41.4	13	44.8
Miss some common abbreviation	13	44.9	12	41.4
Miss a lot of common abbreviations	1	3.4	2	6.9
Do not know about approved list	3	10.3	2	6.9
Reasons for using unapproved abbreviations				
Insufficient time for documentation	10	34.5	11	38.0
Difficulty in accessing approved list	5	17.3	1	3.4
Habit	4	13.8	1	3.4
No enforcement on using the list	1	3.4	2	6.9
Do not know about the approved list	3	10.3	2	6.9
I stick to the approved list	6	20.7	12	41.4
Familiarity with dangerous abbreviation list				
Yes	21	72.4	28	96.6
No	8	27.6	1	3.4
Reasons for using dangerous abbreviations				
Practitioners acquainted with their meaning	9	31.1	7	24.2
QM Staff do not comment on their use	3	10.3	3	10.3
Not convinced of their seriousness	0	0.0	3	10.3
Habit	1	3.4	4	13.8
Other reasons	2	6.9	3	10.3
I do not use dangerous abbreviations	14	48.3	9	31.1
Correct interpretation of abbreviation meaning				
Most frequent dangerous abbreviation (D/C)	11	37.9	15	51.7
Most frequent unapproved format (vs)	17	58.6	20	69.0

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