General practitioner understanding of abbreviations used in hospital discharge letters

Study question

We hypothesised that there is poor understanding by general practitioners of abbreviations used in hospitals, and particularly in electronic hospital discharge letters (eDLs). We thus aimed to determine how frequently abbreviations were used in eDLs and the extent of GPs' understanding of these abbreviations.

Methods

We conducted a retrospective audit of abbreviation use in 200 sequential eDLs at Nepean Hospital, Sydney, a tertiary referral centre. The 15 most commonly used abbreviations plus five abbreviations that we judged to be clinically important were identified from this audit. We then developed a survey questionnaire that used these abbreviations in context and mailed it to 240 GPs in the area covered by the Nepean Blue Mountains Local Health District to determine GPs' understanding of these abbreviations.

The main outcome measures of our study were the number of abbreviations and the frequency of their use in eDLs, and the extent of GP understanding of these abbreviations.

Findings

We found 321 abbreviations in the 200 eDLs audited; 11.3% of these were used in more than 10 separate eDLs. The remainder were less common, with 78.8% being used fewer than four times. Most abbreviations were for investigations, examination findings or management. Six abbreviations were misinterpreted by more than a quarter of surveyed GPs. These included SNT (soft non-tender), TTE (transthoracic echocardiogram), EST (exercise stress test), NKDA (no known drug allergies), CTPA (computed tomography pulmonary angiography), and ORIF (open reduction and internal fixation). These were interpreted incorrectly by 47.0% (62), 33.3% (44), 33.3% (44) 32.6% (43), 31.1% (41) and 28.0% (37) of GPs, respectively. The range and frequency of individual GP scores are shown in the Box.

Limitations

We did not ascertain the demographic characteristics of GPs. The durations of GPs' careers outside the hospital setting may have had an impact on their understanding of abbreviations. Also, we were unable to determine if GPs who did not respond were different, demographically, from those who did. We could not include all the abbreviations found in eDLs in our survey, but as those not included were less common, it is likely that they would be less well understood. Lastly, this was a single-centre study and so our results may not be generalisable to other centres.

What this study adds to current knowledge

Our findings show that there is a deficit in GPs' understanding of abbreviations used in hospitals. Previous studies have looked at the frequency of the medical abbreviations, but none have investigated the understanding of these abbreviations by GPs in the community.

Implications for practice

Our findings highlight an area that may contribute to patient morbidity or mortality because of miscommunication between health care practitioners. It would be imprudent to ignore the magnitude of these findings and not act to minimise the potential for problems. One solution would be to ban the use of abbreviations in eDLs, but this is impractical. Other solutions include creating a list of approved medical abbreviations for use in eDLs that could be distributed to GPs or using computer software to auto-complete mutually exclusive abbreviations (ie, allowing only one possible meaning for each). The last two suggestions are likely to have financial implications.

Competing interests: No relevant disclosures. ■

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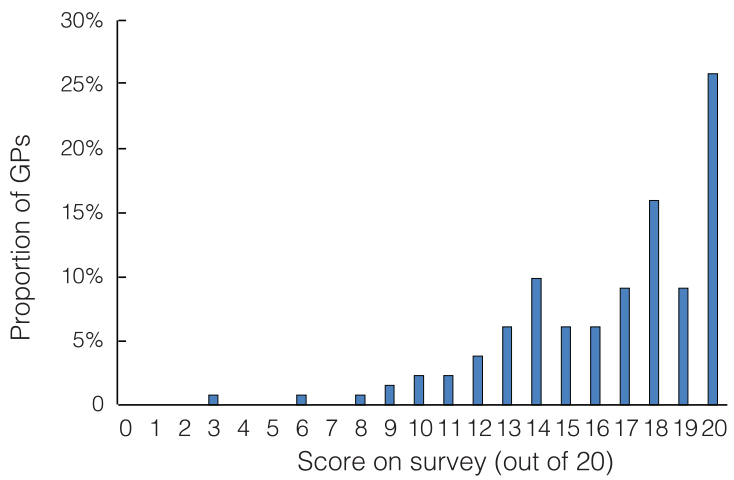
Proportion of general practitioners receiving particular survey scores for correct interpretation of abbreviations



General practitioner understanding of abbreviations used in hospital discharge letters

there is poor understanding among GPs of abbreviations used in hospital discharge letters

Abstract

Objectives: To determine the incidence of abbreviation use in electronic hospital discharge letters (eDLs) and general practitioner understanding of abbreviations used in eDLs

Design, setting and participants: Retrospective audit of abbreviation use in 200 sequential eDLs was conducted at Nepean Hospital, Sydney, a tertiary referral centre, from 18 December to 31 December 2012. The 15 most commonly used abbreviations and five clinically important abbreviations were identified from the audit. A survey questionnaire using these abbreviations in context was then mailed to 240 GPs in the area covered by the Nepean Blue Mountains Local Health District to determine their understanding of these abbreviations.

Main outcome measures: Number of abbreviations and frequency of their use in eDLs, and GPs' understanding of abbreviations used in the survey.

Results: 321 abbreviations were identified in the eDL audit; 48.6% were used only once. Fifty five per cent of GPs (132) responded to the survey. No individual abbreviation was correctly interpreted by all GPs. Six abbreviations were misinterpreted by more than a quarter of GPs. These were SNT (soft non-tender), TTE (transthoracic echocardiogram), EST (exercise stress test), NKDA (no known drug allergies), CTPA (computed tomography pulmonary angiogram), ORIF (open reduction and internal fixation). These abbreviations were interpreted incorrectly by 47.0% (62), 33.3% (44), 33.3% (44) 32.6% (43), 31.1% (41) and 28.0% (37) of GPs, respectively.

Conclusion: Abbreviations used in hospital eDLs are not well understood by the GPs who receive them. This has potential to adversely affect patient care in the transition from hospital to community care.

The transition from hospital to the community is a potentially dangerous time for patients.[1] It often involves a change in medical management, with potential for error. Hospital discharge letters aim to facilitate safe transition of patients into the community. To be effective, discharge letters must reach the general practitioner in a timely manner and contain easily understandable information. These are essential ingredients in effective continuity of care.

Deficits in discharge letters can contribute to a failure of information transfer. Studies have found high rates of omissions and errors in such letters.[2-4] This contributes to errors in care after discharge. One study found that 49.5% of patients discharged from a large academic medical centre experienced at least one medical error relating to change of care on discharge.[2]

In this article, we focus on the potential danger of using abbreviations (shortened forms of words or phrases[5]) in medical communication. Abbreviations used in medical communications are either acronyms or initialisms. Acronyms use the initial letters of words and are pronounced as words (eg, ASCII, NASA); initialisms use initial letters pronounced separately (eg, BBC).[5] Abbreviations are commonly used in medical specialties, but may not be understood by the broader profession. Doctors are under pressure to complete discharge letters in a timely fashion, and abbreviations may be used to facilitate this process.

We identified few published studies of the frequency of abbreviations in discharge letters.[6,7,8] Some reported that abbreviation use is increasing and identified this as a concern. A recent audit at Royal Melbourne Hospital reported that 20.1% of all words in discharge letters were abbreviations.[8] Another study audited abbreviation use in inpatient medical records and surveyed members of an inpatient multidisciplinary team for their understanding of abbreviations.[9] The mean correct response rate was

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1 Categorisation of the 321 abbreviations used in 200 sequential electronic hospital discharge letters

Type of abbreviation	Number	% of total	Representation of the types of abbreviation in the survey
Investigations	102	31.8%	30%
Physical examination finding	56	17.5%	30%
Management	56	17.5%	5%
Service*	22	6.9%	5%
Patient history	20	6.2%	30%
Other	65	20.1%	0
Total	**321**	**100.0%**	**100%**

* A hospital outpatient service such as outreach or outpatient clinics. ◆

2 Frequency with which the 321 abbreviations were used in 200 sequential electronic hospital discharge letters

Frequency	Number (%)
> 20 times	17 (5.3%)
15–19 times	5 (1.6%)
10–14 times	14 (4.4%)
5–9 times	32 (10.0%)
0–4 times	253 (78.8%)

43%, with Postgraduate Year 1 doctors posting the best scores (57%) and dietitians posting the worst (20%).

However, we identified no published studies determining whether the abbreviations used in hospital discharge letters are understood by GPs, who are usually the recipients of discharge letters.

Methods

We retrospectively analysed 200 electronic hospital discharge letters (eDLs) of patients discharged from Nepean Hospital, Sydney, a tertiary referral centre, from 31 December 2012, working backwards to 18 December 2012. We stopped at this point because few new abbreviations were being identified. To be included in the audit, an eDL had to be addressed to a GP.

We chose 31 December to begin the analysis to provide a representative sample of junior doctors who had a minimum of almost a year of hospital experience.

The meaning of each abbreviation was inferred from the surrounding text, and abbreviations were categorised as shown in Box 1.

Survey of GPs

From the audit, we developed a survey using the 15 most commonly used abbreviations plus five less frequently used but clinically important abbreviations. We determined that abbreviations of investigations, management or services were likely to be most clinically significant, based on our clinical experience and the potential consequences of misinterpretation. We defined commonly used abbreviations as those that were used at least 20 times in the audit. In the resulting survey of GPs, each abbreviation was provided in the context of a phrase in which it had been used in a discharge letter (Appendix 1).

To provide adequate precision, we aimed for 100 GP responses. The survey was mailed to all 240 GPs listed in the 2014 edition of the Medical Practitioners' Directory for the Nepean, Blue Mountains and Hawkesbury areas. This was the most extensive directory of GPs in this area available to us. Responses were returned in a coded envelope inside a postage-paid envelope. GPs who did not respond were resent surveys on up to two additional occasions.

Outcome measures

Survey responses were analysed to determine what proportion of GPs understood each abbreviation.

Ethics approval

The study was approved by the Nepean Blue Mountains Local Health District Human Research Ethics Committee.

3 Frequency of incorrect interpretation by general practitioners of 20 common or clinically significant abbreviations

	GPs misinterpreting abbreviation	
Abbreviations	Number	Percentage (95% CI)[10]
SNT	62	47.0% (38.5%–55.5%)
TTE*	44	33.3% (25.3%–41.3%)
EST*	44	33.3% (25.3%–41.3%)
NKDA	43	32.6% (24.6%–40.6%)
CTPA*	41	31.1% (23.2%–39.0%)
ORIF*	37	28.0% (20.4%–35.7%)
HSDNM	31	23.5% (16.3%–30.7%)
B/G	31	23.5% (16.3%–30.7%)
GCS*	24	18.2% (11.6%–24.8%)
ADLs	18	13.6% (7.8%–19.5%)
PMHx	4	3.0% (0.1%–6.0%)
CT	4	3.0% (0.1%–6.0%)
ECG	4	3.0% (0.1%–6.0%)
CXR	4	3.0% (0.1%–6.0%)
O/E	4	3.0% (0.1%–6.0%)
BP	3	2.3% (0–4.8%)
GORD	3	2.3% (0–4.8%)
RR	2	1.5% (0–3.6%)
ED	2	1.5% (0–3.6%)
HR	2	1.5% (0.–3.6%)

* Less common but clinically significant abbreviations.
ADLs = activities of daily living. B/G = background. BP = blood pressure. CT = computed tomography. CTPA = computed tomographic pulmonary angiography. CXR = chest x-ray. ECG = electrocardiogram. ED = emergency department. EST = exercise stress testing. GCS = Glasgow coma scale. GORD = gastro-oesophageal reflux disease. HR = heart rate. HSDNM = heart sounds dual and no murmur. NKDA = no known drug allergies. O/E = on examination. ORIF = open reduction and internal fixation. PMHx = past medical history. RR = respiratory rate. SNT = soft, non-tender. TTE = transthoracic echocardiogram. ◆

Results

Electronic discharge letter audit

We found 321 different abbreviations in the 200 eDLs audited (a rate of 1.6 new abbreviations per eDL and 7.1 total abbreviations per eDL); most were initialisms. The frequency of abbreviations in eDLs is shown in Box 2.

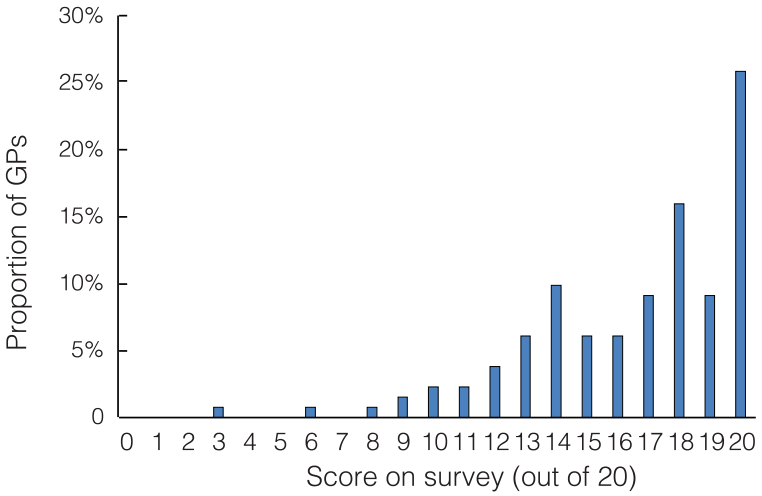
Hospital coding-approved abbreviations accounted for 62.6% of all abbreviations identified. Seven unapproved abbreviations (2.2%) were in common use (ie, found more than 20 times in the audit).

GP survey

The response rate was 55% (132 of 240 GPs). No abbreviation was correctly interpreted by all GPs, but 10 abbreviations (50%) were interpreted correctly by 97.0% of GPs (128).

The frequency of incorrect interpretation of all abbreviations in the survey is shown in Box 3. Box 4 shows the range and frequency of individual GP scores.

4 Proportion of general practitioners receiving particular survey scores for correct interpretation of abbreviations



Discussion

The results of our survey show that there is poor understanding among GPs of abbreviations used in hospital discharge letters. The response rate to our survey was fair, so our results are likely to be representative of GPs in the area.

Worryingly, more than half of the abbreviations we found related to investigations, management or services that we considered to be the most clinically significant categories. Misinterpretation of abbreviations by GPs can adversely affect patient care through duplication of investigations, failing to institute treatment based on investigation results or failing to follow up with recommended management. We could find no studies that identified which types of abbreviations confer the worst outcomes if misinterpreted. Also of concern is that almost half of the abbreviations we identified were used only once in the 200 eDLs.

The difference identified in the use of abbreviations by junior doctors and understanding of abbreviations by GPs suggests a lack of consistency between the language commonly used in hospitals and that used by GPs. It is uncertain how well understood these same abbreviations are by hospital doctors in different specialty areas. The language of abbreviations may also vary between hospitals. Common abbreviations found previously in Royal Melbourne Hospital discharge letters[8] were different from those we found. The five most common inappropriate ambiguous or unknown abbreviations in the Royal Melbourne Hospital audit were not found in any eDL in our audit. Their abbreviation rate was higher, with a mean of 10.5 new abbreviations per discharge letter compared with our rate of 1.6. Widespread use of abbreviations in paediatric medical notes with no standardisation and difficulty in interpretation by health care professionals has also been previously reported.[11]

Our study has some limitations. Non-responding GPs might have scored differently on the survey compared with those who responded. Also, we did not ascertain GP demographic characteristics such as length of career outside the hospital setting. GPs with more recent hospital practice may better understand these abbreviations. In addition, we could not assess GPs' understanding of most abbreviations we identified in the eDL audit because of the large number identified. However, we expect that understanding of these less frequently used abbreviations would be poorer than for the 20 we included in our survey. Also, this study was conducted in a single centre, so the results may not be generalisable to other centres. However, junior doctors are drawn from many universities and it is likely that discharge practices are similar in other hospitals.

Conclusion

Discharge letters are an essential means of communication between hospitals and GPs to facilitate optimal care of patients when they return to the community. All abbreviations used should be understood by all GPs. Strategies to improve communication by means of discharge letters are urgently needed. Potential solutions include banning the use of abbreviations in eDLs or using only a limited number of hospital-approved abbreviations and providing GPs with an approved abbreviation list. Another option would be use of computer software to auto-complete mutually exclusive abbreviations (ie, allowing only one possible meaning for each).

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Competing interests: No relevant disclosures. ■

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