AUSTRALIAN COMMISSION ON SAFETY AND QUALITY IN HEALTHCARE

Electronic Discharge Summary Systems Literature Scan

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1 eDischarge Literature Scan

1.1 Purpose

This literature scan was undertaken by KPMG, as part of the e-Discharge Evaluation Project, on behalf of the Australian Commission on Safety and Quality in Health Care (ACSQHC).

The purpose of this document is to inform the development of the project evaluation framework and specific 'areas of enquiry' for investigation during the evaluation. These, in turn, will guide the development of the surveys and data analysis undertaken during the project.

This document synthesises relevant material sourced during a scan of publicly-available literature (see Search Strategy below). However, it should be noted that this document is not intended to be an exhaustive review of all available literature.

1.2 Search strategy

This literature scan was informed by a review of publicly available literature. Searches were conducted via two main search engines.

1. Using the Google search engine, searches were conducted using combinations of the following keywords:

   - Structured document templates
   - Discharge
   - Patient discharge
   - Document templates
   - Structured forms
   - Reporting templates
   - Electronic discharge
   - eDischarge.

From the Google search, a range of documents were identified, including policy documents, presentations and scholarly articles. Where relevant, references from these documents were identified and original source documents retrieved.

2. A search of the Medline database was also conducted. MeSH headings used to direct the search were combined in a number of permutations and included:

   - Patient discharge
   - Documentation
   - Forms and records control
   - Medical records systems, computerised
   - Hospital information systems.

Limits were applied and included in all circumstances: English language, humans and abstracts. Articles outside the date range 1997 to current were not considered.

2 Discharge summaries

2.1 Clinical handover

Clinical handover is the term used to refer to the "transfer of professional responsibility and accountability for some or all aspects of care for a patient, or group of patients, to another person or professional group on a temporary or permanent basis"[1]. Clinical handovers occur frequently along a patient's journey through the health system, such as between like workers at shift change in a single facility, between clinicians upon transfer to a different unit within a hospital, or when a patient enters or leaves a particular health care facility.

The frequency at which clinical handovers occur has increased in recent years, partly due to the reduction in doctors' work hours which has increased the number of shift turnovers and, as a consequence, the number of handovers. The complexity of handovers is also increasing, due to the increasing complexity of care, the use of more technology, and the involvement of more health care professionals and support services for each patient[2].

It is well established that complex systems provide more opportunity for error[3]. As such, the point of clinical handover is one where errors may occur. Efforts to improve the quality and safety of health care have not only recognised that clinical handover is a point of potential risk for the patient but that, for handovers to be effective, targeted strategies including organisational support are integral to improved processes and subsequent reduction of risk [4].

2.2 Handover at patient discharge

Clinical handover at the point of patient discharge is of critical importance. In a literature review of clinical handover conducted in 2008, a group of Tasmanian researchers identified a number of high risk scenarios in clinical handover. Identified as one of these high risk scenarios was the hospital to community handover (that is, discharge from the hospital to the community). These identified risks related to poor discharge processes due to shift to shift handover, and poor communication and difference in information quantity/quality depending on a patient's community destination[5]. Stemming from these risks was the increased incidence of medical errors and re-hospitalisations[6].

Unlike handover at many other points in patient care where information may (partly or wholly) be transferred verbally, clinical handover at the point of discharge generally occurs via a written document, usually in the form of a discharge summary.

Key learnings:

Clinical handover is a point of potential risk for the patient.

The hospital to community handover (i.e. discharge from the hospital to the community) is a high-risk scenario in clinical handover.

2.3 The discharge summary

A discharge summary is a "collection of information about events during care by a provider or organisation"[7]. Its purpose is to provide both clinical and administrative information about the patient's hospital stay such that health care providers in the community can maintain continuity of care[8]. These providers may include general practitioners, specialist doctors, residential aged care facilities or other health care providers involved in the patient's care (e.g. allied health, community nursing).

2.3.1 Discharge summary components

A number of authors have identified a range of items deemed as necessary for inclusion in a discharge summary. It is notable that not all items are identified by all authors as critical. Some of the most common items identified as necessary include[9][10][11] [12]:

- accurate primary diagnosis and relevant secondary diagnoses
- physical examination findings and laboratory results
- investigations
- procedures
- complications and drug allergies
- hospital follow up arrangements
- medical and/or including social issues requiring follow up
- discharge medications
- dates of admission and discharge.

The above items are all included in the National E-Health Transition Authority's (NEHTA's) discharge summary (version 2.1).[13] NEHTA's discharge summary requires

information to be provided in the broad categories of event; medications; health profile; and plan, with the facility for reports and additional documents to be included as necessary.

In some jurisdictions, there are standards in place which specify the required content items for inclusion in the discharge summary. Broadly, these tend to represent only a subset of the items identified above, or more general items which may or may not include the above items. For example, Joint Commission on Accreditation of Healthcare Organizations (JCAHO) standards require the following elements to be included[14]:

- reason for hospitalisation
- procedures performed
- care, treatment and services provided
- patient's condition at discharge
- information provided to the patient and family.

JCAHO also specify that the discharge summary must be completed within 30 days of discharge.

2.3.2 The need for quality in discharge summaries

A range of problems have been identified with discharge summaries. Broadly, the key problems centre around delays in communication, the inclusion of inaccurate information and the omission of important information. These issues are well supported by the literature. For example, in a literature review of communication and information transfer between hospital-based and primary care physicians, Krippalani et al identified that the availability of a discharge summary at the first post discharge visit to the patient's primary care physician was low (12 percent to 20 percent), remaining poor at four weeks (51 percent to 77 percent)[15]. Further, important information was perceived to be omitted, including that illustrated in Table 1 below.

Table 1: Type of information omitted from discharge summaries (Krippalani et al, 2007)

Type of information missing	% of records missing this information
diagnostic test results	63
treatment or hospital course	7 - 22
discharge medications	2 - 40
test results pending at discharge	65
patient or family counselling	90 -92
follow-up plans	2 -43

Given that direct communication between hospital and primary care clinicians is unusual, the major communication mode is through discharge summaries. Further, the frequency of these omissions was not ameliorated by direct communication with the GP, which Krippalani identified to only be occurring between three and 20 percent of the time.

Problems such as those identified in the review by Krippalani may be associated with negative consequences for patients. For example, in a review of adverse events affecting patients after discharge from hospital, Forster et al identified that where adverse events were preventable or ameliorable (i.e. adverse events whose severity could have been decreased), the most common root cause was poor communication between hospital clinicians and either the patient or the primary care physician[16]. McMillan et al (2006) identified a total of 222 medication errors in their review of 100 discharge summaries, finding that nearly thirteen percent were considered to be potentially serious or have the potential to cause readmission[17]. Similarly, Perren et al (2008) evaluated 622 discharge summaries finding there were drug omissions affecting 251 (40 percent) patients, 32 percent of which were considered to be potentially harmful[18]. Further, 17 percent of all medications were unjustified, and of these unjustified medications, 16 percent were considered to be potentially harmful.

Key learnings

Studies have identified a number of items deemed as necessary for inclusion in a discharge summary, however there is variation between authors.

Key problems identified with discharge summaries include delays in communication, the inclusion of inaccurate information, and the omission of important information. These problems may be associated with adverse events for patients. There is well documented evidence of such events relating to medication errors.

2.4 Improving the quality of discharge summaries

Whilst there are a number of studies which identify some of the problems associated with discharge summaries (section 2.2), in order to improve their quality, there must be some establishment of what is necessary for high quality discharge summaries. To this end, Walraven and Rokosh (1999) conducted 100 surveys of hospital-based and primary care physicians to identify the essential elements of a high quality discharge summary[19]. Both process and content factors were considered. Overall, there was significant consensus amongst physicians that summaries that were short, contained pertinent information and were delivered quickly, were of high quality. More specific findings are illustrated in Table 2 below.

Table 2: Elements contributing the most to high quality discharge summaries[20]

Characteristic of summary associated with quality	Detail
Short length	High quality summaries are less than two pages.
Quick delivery time	Highest quality is received in less than one week, if not, summary must be received within two weeks of discharge
Pertinent information included	Items perceived to contribute the most to quality (in order of importance): • Discharge diagnosis • Admission diagnosis • Discharge medications • Active medical problems at discharge • Important pending lab test • Procedures in hospital • Complications in hospital • History of presenting illness if diagnosis is uncertain • Pertinent normal and abnormal lab results • Outstanding issues at discharge • Pertinent normal and abnormal findings on physical examination • Follow-up

Further, clinicians demonstrated a distinct preference for discharge data to be presented in a structured format, as opposed to a narrative form.

Key learnings

Characteristics of high quality discharge summaries include:

- short (<2 pages)
- contain pertinent information (e.g. discharge meds, follow up)
- are delivered quickly (best within one week).

3 Initiatives to improve discharge summary quality

A number of initiatives have been trialled to address deficits in discharge summaries and subsequently improve patient outcomes. The most commonly implemented interventions have been the implementation of computer-generated discharge summaries, changing the mode of delivery of discharge summaries, and changing the format of discharge summaries[21]. This section outlines interventions relating to changing the format (using structured document templates) as well as implementing an electronic discharge summary system (which may or may not involve changing the mode of delivery).

3.1 Structured document templates

Structured document templates, or standardised types of reporting forms, have been used to improve the quality of clinical communication in a number of settings, including that of discharge. The underlying principle of using a template to improve quality relates to minimising the effect of human factors through reducing and simplifying the steps in the reporting process as well as providing strong prompts to users to include certain types of information[22].

In addition to these potential safety and quality benefits, there is evidence to demonstrate that clinicians have a strong preference to provide and receive structured discharge summaries, under a series of subheadings, rather than an unstructured narrative[23].

3.1.1 Safety and quality effects of structured document templates

There are a limited number of studies relating to the use of structured document templates for discharge summaries. One study, undertaken by Rao et al (2005), assessed the effect on discharge summary quality following the establishment of a discharge summary template[24]. In this study, the 'template' consisted of a checklist of all items to be included in the discharge summary, as the summaries were dictated, rather than written by the discharging physician. To assess quality, the authors developed a quality score that measured four components: inclusion of specific content items, exclusion of extraneous material, clarity of style and consistency of material presented with the principle diagnosis. Discharge summaries were sampled both before and after the introduction of the standardised template. Following the introduction of the template, the average of the three raters' scores relating to quality improved 21 percent, with dictation length decreasing 67 percent.

Another study, undertaken by Helleso (2006) examined the effect of the implementation of a standardised nursing discharge template[25]. The author concluded that the use of the template contributed to an improvement in the completeness, structure and content of the information in the nursing discharge notes.

Naidu et al (2008) audited the practice of providing a discharge summary in a standardised pre-formatted form to patients visiting an Indian emergency department[26].

Auditing of the notes of 200 patients who visited the ED during a two month period demonstrated that 100 percent of patients received a discharge summary, more than 80 percent had accurate information regarding their name, sex, date of visit, diagnosis, and prescription dosage and duration. Documentation of the indication for the prescription was documented in only 27 percent. Investigation results were only documented in 15 percent of discharge summaries and follow up advice was only documented in 7 percent. It should be noted however that in this study the 'discharge summaries' were only provided to the patients for the purpose of taking it to their own doctor, rather than being sent to another clinician directly.

Outside the discharge setting, there has been some recent work undertaken in evaluating tools to support clinical handover more generally. Whilst there are a range of interventions to support more effective clinical handover, one common element has been the use of a clinical handover template, which specifies the minimum data which must be populated to support the handover process. There may be some relevance of the findings of this evaluation to the discharge setting. Quin et al (2009) undertook an evaluation of the acceptability of standardised clinical handover tools at four Victorian health services[27]. The authors reported that participants in the project considered that the clinical handover template containing the minimum dataset was a useful foundation which could be customised for individual organisations. Further, it was perceived that the template served to highlight ongoing management issues to the staff on the next shift. Compliance in completing the template was identified as an issue by an analysis undertaken of the templates at one site, with certain fields (e.g. results pending, examination findings and ongoing management plan) not being completed by medical staff. The authors did not report on factors which may have underpinned these compliance issues.

Key learnings

There is limited evidence demonstrating the benefits of structured document templates in the discharge setting.

- There is some evidence that when appropriately used, structured document templates have the potential to improve the completeness, structure and content of information in discharge summaries.
- Clinicians prefer to receive structured discharge summaries under a series of subheadings, rather than an unstructured narrative.

3.2 Electronic discharge

The eHealth environment is being embraced at many points in the health system, with work being conducted at a jurisdictional and national level by health departments and related bodies. While the end goal is an integrated electronic health record (EHR), capturing information throughout the continuum of care, only some elements (e.g. ePrescribing, electronic medications management (EMM), e-Discharge and electronic medical records (eMR)) are currently available in Australia, and these elements have not been uniformly implemented in any Australian jurisdiction.

Review of the literature demonstrates that the term 'electronic discharge' is applied to a range of different configurations. Some examples of electronic discharge systems include those where:

- discharge software is added to an existing eHealth system (e.g. EMM, PAS, ePrescribing systems) and information is electronically transferred between the existing system/s and the eDischarge system

- the discharge summaries are generated electronically but then manually (e.g. faxed or mailed after being printed) transmitted to the GP

- some data is automatically populated into the electronic discharge summary, whilst other items must be entered by manual transcription from the paper medical record.

Given the lack of uniformity, it is difficult to make systematic conclusions as to the effect of eDischarge systems on safety and quality, as each study presents a differing system configuration, making comparison between studies more challenging. Some of the research is presented in section 3.2.1 below.

3.2.1 Safety and quality effects of eDischarge

With respect to safety and quality, the literature provides evidence of a range of effects of eDischarge systems. That is, studies demonstrate both safety and quality benefits, cases of little or no effect, as well as instances where eDischarge systems have been associated with lower quality. The most common assessment of quality has been assessment of the discharge document itself by either hospital or primary care physicians. Overall there are few studies which examine the effect of eDischarge on patient outcomes.

eDischarge has a positive effect

There is limited evidence to demonstrate the safety and quality benefits of eDischarge systems. There are however, some promising indications of possible benefits, particularly in relation to some of the issues identified by the literature to be associated with poor quality summaries, such as timeliness, legibility and accuracy.

In the Australian context, Ribbons (2007), reported on the effects of the implementation of e-Discharge summaries on the continuity of care at Frankston Hospital in Victoria[28]. In this setting, the e-Discharge system was part of a broader eHealth initiative at the hospital, which also included ePrescribing and eResults. Discharge summaries were transmitted to GPs using a third-party provider (HealthLink) which interfaced with the GPs' own medical director software. There was also the capability for auto-fax. Overall, a number of benefits were realised through the implementation of the eDischarge system. These are illustrated in Table 3 below:

Table 3: Benefits resulting from implementation of an eDischarge system at Frankston Hospital (Ribbons, 2007)

Indicator measured	Pre eDischarge system	After eDischarge implementation
Timeliness (i.e. how long it took to be sent to GP)	16 percent within 3 days	88 percent within 24 hours
Legibility	27 percent legible	100 percent legible
Completeness / Content	40 percent useful	87 percent useful
Delivery method	67 percent fax	Approx 60 percent through electronic transmittal

Also in the Australian context, Alderton and Callen (2007) undertook a study to assess general practitioners' satisfaction with the quality of information in electronic discharge summaries and the timeliness of their receipt of the summaries[29]. In this study, eighty-five GPs were surveyed in relation to their satisfaction with the content of the electronic discharge summary and the timeliness of receipt for patients discharged from a hospital which used an electronic discharge summary. The majority of GPs agreed that the electronic summary was an improvement on the manual discharge summary. Further, 83 percent had received the discharge summary within two weeks of patient discharge. The majority of GPs were either satisfied or very satisfied with the quality of the electronic discharge summary in relation to eight different elements including: amount of information, accuracy of information, summary of progress, treatment, follow-up and ongoing management, results, medication and summary layout. There were also suggestions from surveyed GPs that the summary should include more information on follow-up or recommendations for the ongoing management plan, and that the discharge summary should be transmitted electronically as well.

Some benefits with respect to summary completion were identified by Walraven et al (1999) who undertook a randomized clinical trial comparing discharge summaries created by voice dictation with those generated automatically from a electronic clinical database[30]. The database used information which had been populated into the system during the patient's hospital stay. If certain fields had not been completed however, the discharge summary would not be generated – instead, a reminder was manually placed on the patient's file for the physician to take action. The primary outcomes included the proportion of admissions for which a discharge summary was created by

four weeks post discharge and overall summary quality. Summaries were rated by community physicians against some broad criteria (a zero to 100 scale, perceptions of completeness, organisation and timeliness). The study demonstrated that a summary was much more likely to be generated within four weeks of discharge for patients in the database group. Summary quality, completeness, organisation and timeliness were not perceived to be significantly different.

One particular component of an eDischarge system relates to the electronic transmittal of the discharge summary to the patient's general practitioner. Chen et al (2010) undertook a blinded, randomised controlled trial to examine the effectiveness of delivering computer generated discharge summaries to GPs by email, fax, post and patient hand delivery[31]. The authors found that the receipt rates (receipt of summary by GP within 7 days of discharge) of emailed and faxed discharge summaries were similar (74 percent for email and 69 percent for fax), and significantly higher than post (44 percent) and patient hand delivery (24 percent). Despite the success of the email system however, GPs identified that fax was still the preferred method of communication. This preference may have been related to the fact that practice staff were more familiar with receiving faxes (which were usually then scanned into the GP's own electronic system) than email, with few practices in the study sample (39 percent) having a practice email.

Key learnings

Benefits of eDischarge systems may include the improvement of the timeliness, legibility and content (completeness) of discharge summaries

eDischarge systems have been shown to be acceptable for GPs, and an effective way to transmit information to the general practice setting. The receipt of discharge information electronically however, is new, and GPs may require some adjustment to become accustomed to the new system.

eDischarge makes no difference to quality

Despite the benefits realised at some sites (as described in section 3.2.1 above), not all evaluations have demonstrated benefits, with some literature showing no difference between handwritten and electronic discharge summaries with respect to aspects of safety and quality.

Graumlich et al (2009) undertook a cluster randomised trial to measure the effects on patient outcomes of a discharge software application of computerised physician order entry[32]. In this study, a proportion of hospital physicians were randomly assigned to discharge software, with a control group continuing their usual practice of handwritten discharge summaries. The study population included 631 inpatients discharged to home who were considered 'high risk' to readmission. Data was available for 94 percent of patients. When comparing patients assigned to discharge software

versus usual care, there was no difference in hospital readmission within six months, emergency department visit within six months or adverse events within one month.

Callen et al (2009) undertook a study to quantify and compare the medication transcription error rate from hand written medications on manual discharge summaries to typed medications on electronic discharge summaries[33]. In this analysis, 966 handwritten and 842 electronically generated discharge summaries were retrospectively reviewed in an Australian metropolitan hospital. The electronically generated discharge summaries at this hospital were populated via a number of methods: patient administrative details were automatically populated, results of investigations could be copied and pasted in to the electronic discharge summary from the electronic test management information system and discharge medications were automatically transferred into the electronic discharge summary after being manually typed by the doctor into the electronic discharge prescription system. Any other discharge information was typed in free text format into relevant fields. Review of the patients' files demonstrated that there was no difference between computer generated and handwritten discharge summaries, with medication error presenting in 12 percent of handwritten summaries and 13 percent of electronic summaries. By far the most common error in both types of summaries was medication omission (at 7.6 percent of handwritten summaries and 8 percent of electronic summaries). The second most common error was the listing of an additional medication without documentation of a reason (3.6 percent of handwritten summaries and 8 percent of electronic summaries).

This study demonstrates that there is still room for error in eDischarge summaries where information is manually typed in at the time of discharge. It can therefore be assumed that quality in eDischarge summaries are affected by the way in which the summaries are created. It is possible that the most common errors identified in this study may have been reduced had the eDischarge system been part of a more integrated system, linking ePrescribing and eDischarge.

Key learnings

Some studies reveal no difference between handwritten and eDischarge summaries in relation to safety and quality.

The design of eDischarge systems appear to have an effect on the overall quality of summaries. For example, there is still room for error where information is manually typed in to the electronic summary at the point of discharge.

eDischarge may have negative effects

A number of studies also identified some negative effects to be associated with the implementation of eDischarge systems. For example, Callen et al (2007) undertook a

comparison between electronic and paper-based summaries from an Australian hospital in relation to documentation of information regarding the patient's ongoing care[34]. In this study, the authors reviewed 245 discharge summaries, of which 62 percent were electronic and 38 percent were handwritten. The electronic discharge system populated patient administrative details automatically, however required the doctor to cut and paste results of investigations into the discharge summary from the hospital clinical information system. Free text could be inserted against any of the pre-defined headings. Once complete, the electronic discharge summary was printed out and posted to the GP, similar to the handwritten summary. Handwritten summaries were completed on a particular form with the same, structured headings, with triplicate carbon copies. All patient files in the study sample were reviewed according to set criteria, including discharge date, documentation of secondary diagnoses, summary of the patient's treatment and progress, investigations and results, follow-up requirements and discharge medications. The analysis identified that across all items reviewed, the electronic summaries contained a higher number of errors and/or omissions than the handwritten summaries. In relation to the specific items reviewed, electronic summaries were more likely to omit the patient's discharge date and secondary (additional) diagnoses, however they were less likely to omit a summary of the patient's progress in hospital when compared to the handwritten document. The authors hypothesised that the reason for the omissions identified in the electronic discharge summaries may have related to the fact that the omitted fields were found at the beginning of the discharge document, while the majority of the other information was recorded many 'screens' further down the discharge summary, and that this may have led to clinicians forgetting to complete the information at the beginning.

Issues with the quality of content were also identified in the UK setting. Jansen and Grant (2003) undertook a study to determine the quality of computerised discharge summaries issued from an emergency department at a large district hospital in England[35]. The authors undertook a retrospective review of 300 discharge letters and case notes. Discharge letters were assessed against a predefined 'gold standard' letter, which contained the following information:

- an accurate primary diagnosis
- relevant secondary diagnoses
- a concise summary of the patient's management
- hospital follow up arrangements
- any issues including social, requiring follow up or action by the GP.

The study identified that 29 percent of all computer generated discharge information was found to be either incomplete or misleading. Twenty five percent of all correspondence was lacking or unacceptable overall, with the main reasons identified in Table 4. It is of note that additional text had been added to only 8 percent of discharge letters, but in 96 percent of those cases, this text was perceived to be helpful.

Table 4: Main issues in computer generated discharge letters (Jansen & Grant, 2003)

Main issues identified with computer generated discharge letters (Jansen & Grant, 2003)
• Inaccurately or wrongly coded diagnoses (46 percent) • Failure to mention specific issues relevant to the GP in their follow up (22 percent) • Failure to mention the date for removal of sutures (21 percent) • Failure to include important secondary diagnoses (7 percent)

Despite the evidence provided by Alderton and Callen to indicate that GPs were satisfied with electronic discharge summaries (section 3.2.1), there is also research to illustrate the ongoing concerns of some GP users. Pillai et al (2004) analysed the attitudes of GPs on the quality and efficacy of an electronic immediate discharge document (IDD)[i]. In this study, forty GPs in nine practices were recruited for an 18 month pilot project to receive the IDD. Participating GPs received both an electronically transmitted document, as well as a paper copy of the same document. The article however, does not indicate how the various fields of the IDD were populated (e.g. which sections were automatically populated via other eHealth systems, and which were manually entered by the discharging doctor). The views of GPs were elicited through a survey, with a 70 percent response rate. The survey identified that only 30 percent of GPs believed that the information currently included on the electronic IDD was sufficient, with many reporting that inadequate data was provided on discharge medications. Also of note was the fact that 48 percent of GPs were concerned with confidentiality and security of patient information on the internet.

Key learnings

A number of studies have identified negative effects associated with eDischarge systems such as errors or omissions.

Research also indicates ongoing concerns of some GPs receiving eDischarge summaries. These concerns relate to sufficiency of content in the summary, confidentiality and security of patient information, and familiarity with IT equipment.

[i] The immediate discharge document is provided to the patient's GP at the time of patient discharge and aims to detail relevant information necessary for the GP to be able to continue the patient's care. A more detailed document, the 'final discharge document' is subsequently provided. In this study, the immediate discharge document had historically been handwritten, and the final discharge document had been typewritten.

3.2.2 Implementation issues associated with eDischarge systems

There are a number of potential barriers to the implementation of eDischarge systems. Change management is a key concern in the implementation of any new electronic health system, and is particularly so in the case of e-Discharge, involving clinicians external to the discharging hospital, and in a range of settings. These barriers relate particularly to lack of training, organisational change, and user acceptance.

The importance of adequate training and cultural change in an organisation to fully realise the potential of e-Discharge is clear. Organisational support and commitment, along with full stakeholder engagement and involvement, are essential for the implementation and sustainability of changes[36 37 38 39]. Executive commitment and support during the planning and implementation stages of the project is required to promote a culture of change and accountability, and the role of medical champions can be vital[40].

A 2007 study by Callen et al[41] into a comparison between electronic and paper-based discharge summaries (also discussed in Section 3.2.1) found that of the 245 discharge summaries evaluated, the electronic summaries contained a higher number of errors or omission than the handwritten summaries. The author hypothesises that the reasons for these omissions may relate to insufficient training, insufficient education and awareness of the importance of accurate and complete discharge summaries, inadequate computer literacy, unfamiliarity with creating discharge summaries electronically, inadequate user interaction design, and insufficient integration into routine work processes.

Callen et al conclude that clinicians exercised insufficient care when completing discharge summaries, regardless of the method used. To combat the significant number of errors in both electronic and paper-based summaries, the article suggests that further education for clinicians in the importance of the discharge summary document be undertaken. Based on the author's hypothesised reasons for the omissions in the electronic discharge summary, further training in the use of the technology itself may also be required.

Training is required not only for hospital clinicians completing the electronic discharge summary, but also for practitioners receiving it. In 2002, Victoria's Peninsula Health implemented a fully-integrated multidisciplinary electronic discharge summary across its 10 sites. Some GPs' reluctance to take up the new technology involved in electronically receiving discharge summaries was noted as a barrier to implementation, with some practices initially requesting that all discharge summaries still be faxed.[42] This apprehension on the part of some health care providers was also illustrated during the replacement of paper-based transmission of medical documents with a distributed, shared medical record in a hospital in Tyrol, Austria[43]. During the changeover, it was reported that four GPs in total did not want to receive documents electronically, whilst the psychiatric ward declined electronic transmission of discharge summaries because of privacy concerns.

A 2004 study into GP attitudes and responses on the quality and efficacy of an electronic immediate discharge document (IDD) in Scotland revealed that only 30.8 percent of the respondents used the IDD document alone, with the remaining 69.2 percent using both the electronic format of the document along with the mailed copy of the same.[44] Almost half of the GPs felt that some form of formal IT training or induction program would be beneficial to make full use of the IDD.

The importance of adequate change management processes was demonstrated in the implementation of a shared electronic health record in North Brisbane. [45] During this project, approximately 80 percent of the implementation budget was dedicated to change management processes, such as training GPs, practice staff and hospital staff to use the system. This included integrating new e-Health procedures into clinical practice, supporting providers, deploying hospital and general practice liaison officers, informing and managing patient and provider expectations, and focused marketing. This focus on initial take-up was noted by the hospital as one of the key reasons for success in implementation.

Key learnings

There are a number of potential barriers to the implementation of eDischarge systems.

Change management is a key consideration in the implementation of an eDischarge system. Adequate organisational support and commitment, along with training both for the clinicians completing and receiving the discharge summary, is essential.

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