

Electronic discharge summaries: the current state of play

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Abstract

The exchange of health information between acute care providers (e.g. hospitals) and primary care providers (e.g. general practitioners) has traditionally been via hard copy discharge summaries. In recent years the advent of sophisticated information and communication technology has fuelled developments in electronic discharge referral systems (eDRS), which are credited with enabling more timely and accurate information exchange, enhancing patient care, and ultimately improving patient outcomes. The aim of this paper is to highlight key issues regarding the development and implementation of electronic discharge referral systems. A detailed literature review of information related to electronic discharge summaries was undertaken for publications between 1992 and 2006. While eDRS appear to be beneficial, further improvements are needed before systems are dependable. Through prospective enhancements and increased availability of eDRS internationally, electronic discharge referral systems have the potential to facilitate effective communication exchange across the primary-secondary care interface.

Keywords (MeSH):

Patient Discharge; Discharge Planning; Medical Records; Medical Record Linkage; Referral; Health Personnel; Computerized Medical Records

Supplementary Keyword: *Electronic Discharge Summary*

Introduction

Discharge summaries are important, 'multi-purpose' documents. They serve to provide summary data which clinical coders rely upon in the process of clinical classification; they are vital documents for medico-legal purposes, financial and administrative functions; and they have long been the mainstay in the communication process between hospitals and local medical officers or general practitioners (GPs). They contain administrative information, such as patient demographics and follow-up appointments, as well as clinical information, including problems on admission, principal and additional diagnosis, procedures performed, a summary of key events and medications on discharge, all of which are necessary for continuity of care. Traditionally, discharge summaries have been completed manually by junior medical staff (on behalf of the senior clinician responsible for the care of the

patient) at the completion of an inpatient episode of care and are then mailed to the GP.

When written well and in a timely manner, a discharge summary is a useful communication tool. However, criticism relating to the adequacy and efficiency of manual discharge summaries is well documented. In one of the early articles on handwritten discharge summaries, Loke (1996) reports on a Norwegian study which found that the average time for discharge summaries to reach GPs was 28 days, 38% of GPs had not received written communication on the patient's first visit after discharge, and 22% of patients suffered a negative influence on their health because of the delay. In addition to the issue of timeliness, problems with legibility, accuracy and adequacy of content and mode of delivery also remain.

As paper-based health data progressively moves to electronic storage, the opportunity

emerges to move from manually prepared, paper discharge summaries to electronic discharge referral systems (eDRS) capable of electronically generating and transmitting discharge information. Electronic discharge referral systems (eDRS) have the potential to address many of the deficiencies related to manual discharge processes and as such, are the most effective communication means across the primary-secondary care interface. Furthermore, eDRS are an integral part of the electronic medical records (EMR) which have the potential to improve quality of care and the quality of patient outcomes. It is therefore important to review the current situation in relation to eDRS to facilitate their implementation.

Aim and Methods

The aim of this study is to present key issues regarding the development and implementation of electronic discharge referral systems. Peer reviewed journal articles ($n = 67$) and non-peer reviewed literature ($n = 32$) published internationally between 1992 and 2006 were reviewed. The literature included 67 peer reviewed journal articles and conference proceedings from the United Kingdom, United States of America, Europe and Australia. The non-peer reviewed literature (32 sources) consisted of health facility documentation and guidelines, and government websites relevant to electronic discharge summaries.

Findings

A number of issues relating to the development and introduction of eDRS were evident from the literature. Five key issues emerged from the review: benefits of eDRS; GP satisfaction and preferences; standardisation; privacy and security; and barriers to implementation. These issues are discussed below.

Benefits of eDRS

Many studies highlight the important role of electronic discharge referral systems and discharge summaries in bridging the communication gap between primary and secondary care. Advances in technology have resulted in improving continuity of care and ultimately, patient outcomes. Benefits that the electronic system could provide were

emphasised, especially when comparing systems to traditional, paper-based methods. eDRS was found to provide cost effective, timely, and more legible discharge summaries that simplified work practices, decreased error rates, while increasing patient safety and ultimately improving quality of care.

Discharge summaries sent electronically were seen to be timelier than those sent by mail or other paper-based methods like facsimile. In some cases the discharge summary was received before the patient had even left the hospital to return home (Ribbons, Gardner & Craig 2003). However Dougherty (1999) suggested that although electronic discharge summaries can be more timely they are not necessarily more complete. This may be due to logistics and access to technology but needs to be addressed in order to reap the rewards of eDRS and deliver concise, quality discharge summaries. Some noted discharge summary completion times were reduced (Sdrinis, Gardner & Siemienowicz 2004) while other studies suggested that time of completion did not change but the discharge summary changed from a last minute afterthought to a work in progress throughout admission (McAllister 2004).

Cannaby et al. (2004) noted that the implementation of an electronic system resulted in savings in handling, operations, equipment and societal costs suggesting that the benefits of eDRS can also withstand financial scrutiny.

The electronic discharge summary enables improved legibility, thus eliminating the need to decipher illegible handwriting from carbon copy paper (Turner & Birrell 2000; Bolton 2001)

Easier preparation of discharge summaries by hospital clinicians improved work practices of both doctors and nurses in primary and secondary care situations due to the implementation of electronic systems (Laerum, Karlsen & Faxvaag 2004). The degree of improvement was dependent on training and implementation practices by individual institutes.

Electronic discharge referral systems ultimately provide the clinical and administrative information necessary for improved continuity of care and optimal patient outcomes (Mann 2005). They facilitate clinical audit and by doing so provide a means to better identify adverse events, thereby

reducing error rates and improving patient safety (Cao, Stretson & Hripcsak 2003; Ribbons, Gardner & Craig 2003; McMillan, Allan & Black 2006). Although this is useful for research it is too costly for routine screening (Bolton 2001; Selvidge et al. 2003).

GP satisfaction and preferences

The eDRS provide a means by which GP satisfaction and preferences can be monitored and met. It is important to recognise general practitioner preferences for the inclusion or exclusion of specific information in the discharge summary so that the discharge summary can become a quality tool that is succinct and contains relevant information for the continuity of care across primary-secondary interfaces.

The literature highlighted that GPs considered timeliness, follow-up information, discharge medications and information about treatment received in hospital to be important inclusions of the discharge summary (Bolton et al. 1998). It was also noted that those electronic systems that incorporated laboratory results and pharmaceutical information were highly valued (Thomas & Craig 2003). The incorporation of electronic prescribing has led to a significant reduction in medication errors while access to imaging and laboratory databases has helped to avoid repeat examinations and assist in timeliness (Thomas & Craig 2003; Ribbons, Gardner & Craig 2003). Most GPs are satisfied with electronic discharge systems but suggest further improvements are needed before systems can be regarded as infallible. A minority of GPs deem them to be deficient and incomplete (Castleden et al. 1992; Jansen & Grant 2003). Convincingly, the electronic discharge summary provides a number of benefits to both doctor and patient by facilitating improvements in continuity of care and the quality of patient outcomes by reducing any fragmentation existent between sectors.

Standardisation

There are a number of terms which can be used to refer to the communication between the hospital and the GP on discharge of the patient; for example, 'discharge summaries', 'discharge letters', 'discharge notes', and 'discharge referral letters'. This brief example serves to highlight one

of the key issues surrounding the debate about eDRS, namely, standardisation, or more correctly, the lack thereof.

It is evident from the literature that technical and organisational issues still remain to be solved in order to facilitate data exchange between hospital and primary care. As such, there is a need to overcome the barriers of software heterogeneity and a lack of standardisation in data exchange protocols (Muller, Butta & Prokosch 2003). Similarly, clinical language needs to be standardised so as to enhance communication between sectors of the health service, organisations and healthcare professionals (O'Hagan 2004; National E-Health Transition Authority 2006a).

Variations also exist in the design of eDRS and in the content of electronic discharge summaries. A number of researcher studies (Pagliari, Gilmour & Sullivan 2004; Cheah et al. 2005; General Practice Divisions, Victoria 1999) have advocated the need to develop minimum data sets for the collection and transmission of information between hospitals and GPs. In addition, there is resounding support in the literature for the use of templates in the completion of electronic discharge summaries; in essence templates promote standardisation and consistency.

Tran and Cohen (2003) argue template functionality helps to improve user acceptance of eDRS. They consider that template-driven systems save time in completing discharge summaries, while Tattersall et al. (2002) note that the reader of the discharge summary also benefits from a structured format as the use of headings allow them to easily identify and locate desired information. Others (Van Walraven & Rokosh 1999; Rao et al. 2005) concur and report that templates used as part of discharge planning have the potential to enhance the quality of the discharge summary and ensure it includes a minimum data set as preferred by GPs. The quality of the discharge summary is increased and its length shortened with the use of a template, thus decreasing the cost and time spent reading the summary. Templates are also seen as an effective mechanism in dealing with the needs of various medical and surgical specialities (Thompson & Olla 2006).

Privacy and security

Concerns about the confidentiality of electronic health information, access to electronic health data and security of health information systems remain prevalent in the literature reviewed.

In a study conducted in Austria by Schabetsberger et al. (2006) it is reported that some health care providers were apprehensive about the electronic transfer of documents, and four GPs refused to receive electronic documents at all. Furthermore, one hospital's psychiatric ward declined electronic transmission of their discharge summaries because of the highly sensitive nature of the data contained therein.

Electronic signatures emerge as an issue in eDRS, given that they, like many other medical documents generated in hospital, are 'signature relevant' and often require multiple signatures. Brandner et al. (2002) noted the importance of electronic signatures in electronic documents so as to ensure their integrity and authenticity, and argue that signature functionality must be integrated into the workflow surrounding document creation, ideally by using Public Key Infrastructure (PKI).

It is apparent that while discharge summaries may be completed using an eDRS system, the mode of transmission of the information may not necessarily be electronic; rather the transfer method varies from email, to automated faxing or manual faxing, to patient delivery, telephoning and to the traditional process of mail delivery. Wilson et al. (2001) suggest that encrypted email using PKI be used to send electronic summaries and recommend that such measures would help ensure the security of the communication between the hospital and GPs, as well as enhancing timeliness and effectiveness. However, some countries have privacy legislation that prohibits the electronic transfer of discharge summaries. The Australian Law Reform Commission is currently reviewing the Commonwealth *Privacy Act 1988* in light of the evolving technology, with many suggesting the development and enactment of legislation specific to e-health systems, of which eDRS is a part (National E-Health Transition Authority 2006b).

Barriers to implementation

While the benefits of eDRS are well documented, so too are the impediments to the implementation of this new technology. Information technology infrastructure and access to technology are raised as issues of concern. The need for more computers within hospitals and general practice units is identified, as is the need for GPs to have adequate broadband access to allow for electronic transmission of the eDRS.

Once the hardware is in place however, eDRS systems may still encounter obstacles due to user acceptability and uptake issues, which in turn may be influenced by previous innovation and implementation experiences and the degree of 'user friendliness' of the system. Like any new technology, the introduction of eDRS requires support in the form of training and education of health professionals to ensure their proficiency and confidence in the use and maintenance of the system. Massy-Westropp et al. (2005) express concern regarding training in eDRS systems, particularly in terms of the time involved for large scale training sessions and the impact it will have on work practice especially in the early stages of implementation.

By far the strongest and most consistent issue raised in the literature regarding implementation of eDRS is that of the process of change and the importance of carefully and strategically managing the introduction of new technology. A number of researchers (Reponen et al. 2004; Jones & Rodda, 2005; Smith et al. 2005; Scheeringa et al. 2003; Laurence et al. 2004), all suggest that to be successful, hospital-community integration initiatives, such as eDRS, require: clinical leadership for encouraging acceptance, stakeholder involvement and engagement with GPs, regular communication including meetings and reference site visits, a well developed project plan, better value of discharge summary documents, and changes in attitudes and beliefs surrounding the discharge process. A supportive environment, a coordinated approach and effective leadership and management are all critical factors for the successful implementation of eDRS.

Conclusion

It can be seen that there are a number of issues reported in the literature related to the introduction and implementation of eDRS. It is essential that these concerns be addressed to enable the full benefits of eDRS to be realised.

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