

# Electronic discharge summary and prescription: improving communication between hospital and primary care

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## Abstract

**Background** The discharge letter is a key component of the communication pathway between the hospital and primary care. Accuracy and timeliness of delivery are crucial to ensure continuity of patient care. Electronic discharge summaries (EDS) and prescriptions have been shown to improve quality of discharge information for general practitioners (GPs). The aim of this study was to evaluate the effect of a new EDS on GP satisfaction levels and accuracy of discharge diagnosis.

**Methods** A GP survey was carried out whereby semi-structured interviews were conducted with 13 GPs from three primary care centres who receive a high volume of discharge letters from the hospital. A chart review was carried out on 90 charts to compare accuracy of ICD-10 coding of Non-Consultant Hospital Doctors (NCHDs) with that of trained Hospital In-Patient Enquiry (HIPE) coders.

**Results** GP satisfaction levels were over 90 % with most aspects of the EDS, including amount of information (97 %), accuracy (95 %), GP information and follow-up (97 %) and medications (91 %). 70 % of GPs received the EDS within 2 weeks. ICD-10 coding of discharge

diagnosis by NCHDs had an accuracy of 33 %, compared with 95.6 % when done by trained coders ( $p < 0.00001$ ).

**Conclusion** The introduction of the EDS and prescription has led to improved quality of timeliness of communication with primary care. It has led to a very high satisfaction rating with GPs. ICD-10 coding was found to be grossly inaccurate when carried out by NCHDs and it is more appropriate for this task to be carried out by trained coders.

**Keywords** Discharge letter · GP satisfaction · Patient safety · Continuity of care

## Introduction

A crucial element of a patient's care pathway is accurate and timely communication between the hospital team and the general practitioner (GP) [1, 2]. Poor quality, delayed communication may lead to lack of continuity of care and suboptimal outcomes and satisfaction levels for both the patient and the GP [3, 4]. In Irish hospitals, the main communication pathway is via the hospital discharge letter and prescription. It has been shown that up to 11 % of discharge letters are not received within 4 weeks and that up to 9 % never arrive at all [5, 6]. It has been shown that electronic discharge summaries lead to improvements in quality and timeliness of delivery [7]. An Australian study looked at the GP satisfaction levels for electronic discharge letters and found that they were satisfied with the data elements and timeliness of delivery, which was less than 2 weeks in the majority of cases [8].

The paper-based system in our institution involved a one-page handwritten discharge summary. This had a number of drawbacks including poor legibility, missing information and often delayed delivery to primary care.

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There was a need for a more accurate, clear and concise means of communication that was consistent and satisfactory to GPs.

When discharge letters are sent, consultants and non-consultant hospital doctors (NCHDs) generally receive little feedback and have a poorly developed concept of what the GP is looking for. We aimed to address this by piloting the new electronic system in September 2012 and then evaluating the satisfaction levels of GPs with the new electronic discharge summary (EDS) in terms of quality and accuracy of information, the level of detail required and which details were most important. We also aimed to find out how soon they wanted to receive the letter. This information would then allow us to make further improvements to fulfill expectations of the GPs.

Another issue with the EDS was the requirement for ICD-10 coding of the discharge diagnosis. Previously the primary and secondary diagnoses were handwritten in the paper-based letter and then coded at a later date by ICD-10 coding personnel. The new system placed this responsibility in the hands of NCHDs, something they may not previously have done and for which they had received no training. Henderson et al. [9] showed a coding accuracy of 85 % when the primary diagnosis was coded by trained coders. Studies by Davie et al. [10] and Farandzipour et al. [11] showed primary diagnosis accuracy of 86 and 71.3 %, respectively. To our knowledge, there have been no previous studies in the literature where NCHDs have performed this task. As such, the accuracy with which this task was carried out by both coders and NCHDs was assessed.

The purpose of this study was to develop a new format and to assess improvement of the above areas, strengthening the level of communication between the hospital and GPs and assessing the satisfaction levels among the GPs.

## Methods

Three large primary care centres, with a total of 18 GPs who received the greatest number of electronic discharge summaries from Portiuncula Hospital over a 6-month period from July 2012 to January 2013, were selected to ascertain satisfaction levels with the new system. These were chosen due to the volume of discharge letters they receive and, as such, were felt to be in a good position to critique the new EDS.

Semi-structured interviews were carried out with 13 of the GPs where they were asked about levels of satisfaction with the electronic discharge summaries and prescriptions in terms of level of detail, accuracy and timeliness of delivery (see Figs. 1, 2). All 13 GPs were asked to rank from 1 to 5 their level of satisfaction (1 = very unsatisfied, 5 = very satisfied) with various different headings

including amount of information provided, accuracy of information provided, GP information and follow-up and layout (see Fig. 1). The scores were added together to generate a percentage for each variable.

A retrospective cohort study of 90 charts randomly selected from the pilot period was also undertaken to assess the accuracy of coding by NCHDs. 45 charts had the primary diagnosis chosen by a HIPE coder and 45 charts had the primary diagnosis chosen by an NCHD. The hospital HIPE manager and consultant surgeon then independently assessed the accuracy of the ICD-10 diagnoses to the confirmed diagnoses. SPSS V.22 was used for statistical analysis and statistical significance was defined as a  $p$  value  $<0.05$ .

## Results

### GP satisfaction

Thirteen GPs across three different practices were interviewed using the structured questionnaire. All but one of the GPs were familiar with the new electronic format from the hospital.

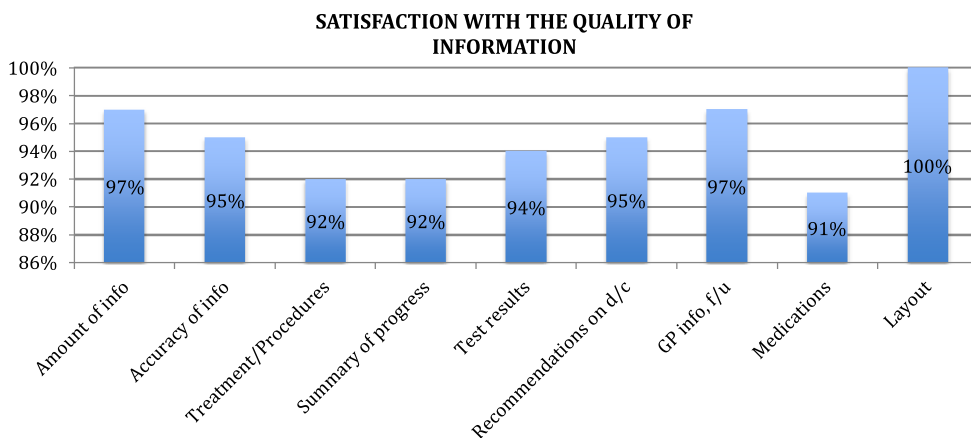
The GPs demonstrated a very high level of satisfaction overall with most aspects of the EDS and prescription (see Fig. 1). Satisfaction levels ranged from 91 to 100 %. The GPs were also given a similar list of various elements of the EDS and asked to select any element they considered important (see Fig. 2). List of diagnoses, treatment/procedures, GP information and follow-up and discharge medications were all selected by all of the GPs. Recommendations on discharge was also considered important by 92 % of those interviewed.

70 % of GPs confirmed receiving their EDS within 2 weeks of discharge, the remaining 30 % being unsure of the timeframe of delivery. When asked how soon they would ideally like to receive the letter, 77 % chose the day of discharge with the remainder favouring delivery within 1 week.

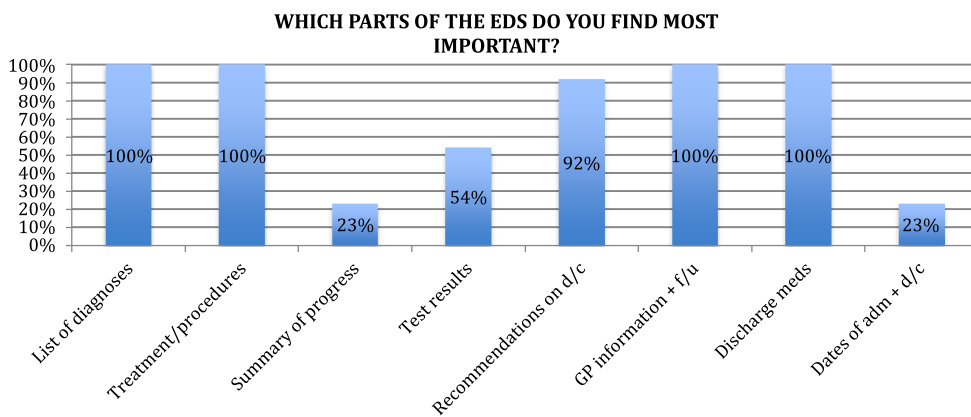
The GPs had little interest in full theatre or endoscopy notes (see Table 1) and 70 % only wished to receive abnormal blood results. All those interviewed found the electronic prescription itself and the medications stopped/held section useful (see Table 2). 30 % said they would like further information regarding the reason why certain medications were stopped and whether they were to be restarted by the GP at any stage. All GPs also expressed an interest in receiving the EDS electronically in the future.

The satisfaction levels with the EDS and prescription were very high among those surveyed. Priorities for GPs would appear to be fast delivery, a brief synopsis of the patient's hospital stay and clear and concise discharge information and instructions for further management in primary care.

**Fig. 1** GP levels of satisfaction with quality of information of EDS



**Fig. 2** Areas of EDS considered important by GPs



**Table 1** Is more detail required in discharge summaries?

	Yes (%)	No (%)
Full theatre note?	0	100
Full endoscopy note?	15	85
Full radiology report?	23	77

**ICD-10 coding**

Of the 45 discharge summaries coded by NCHDs, only 15 (30 %) were accurate. Using the information in the chart the HIPE coders had entirely different ICD-10 codes, independently verified by both the HIPE manager and consultant surgeon. In contrast, 43/45 of those coded by HIPE coders were accurate ( $p < 0.00001$ ).

**Discussion**

Hospital and primary care communication is vital for the safe transition of care from the hospital service to the patient’s own GP [2]. Electronic discharge summaries are welcomed by GPs with a high satisfaction rating. The

**Table 2** Satisfaction levels with sections within EDS

	Yes (%)	No (%)
Is the electronic prescriptions section useful?	100	0
Is the medications stopped/held section useful?	100	0
Would you like more info in this regard?	30 <sup>a</sup>	70
Do you read the allergies section?	92	8
Would you like to receive the EDS electronically in the future, e.g. via health links?	100	0

<sup>a</sup> Why meds were stopped and if they were to be restarted

addition of electronic discharge prescribing is appreciated by the GP and reduces the transmission and repetition of errors of patient medication on patient handover. The availability of a discharge summary at the first post discharge visit has been described as low as 12–34 % [12]. A Canadian cohort study which looked at 6619 GP visits by patients discharged from hospital showed that 68.4 % of patients did not have a hospital discharge summary available for any visit [13]. In terms of accuracy of clinical information, approximately 13 % of letters have an inaccurate or missing main diagnosis and about 30 % of all letters have inaccuracies relating to the follow-up plans—

two of the most critical pieces of information required by the GP during the post-discharge consultation [14, 15].

The benefit of electronic discharge summary system is improved continuity of care and communication with primary care [16]. Prior to the introduction of the new system, GPs received a handwritten discharge summary and a carbon copy of a handwritten prescription. These were often poorly legible and often lacked important details regarding the patient's condition, and a copy of each was filed in the patient's notes which did not always occur leading to a lack of information regarding the patient's admission in the clinical notes.

The discharge letter contains several key pieces of information that are crucial to the delivery of care in general practice. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) has identified admission diagnosis, significant findings, treatment carried out and discharge information provided to the patient as key elements of correspondence between hospital and primary care [17].

We found that levels of satisfaction were very high overall across all aspects of the new electronic discharge summary and prescription. We found that accuracy and amount of information, treatment/procedures, summary of progress, investigations performed, medication and discharge follow-up information all received satisfaction ratings of over 90 %.

Areas of the discharge summary found to be most important by GPs included the admission diagnosis, procedures/treatment carried out and discharge medications and follow-up. Information that GPs found to be less crucial included summary of progress, dates of admission and discharge and summary of inpatient progress. Only 15 % of GPs would like a full endoscopy note and 23 % want a full radiology report in the discharge summary. Similarly, 70 % only want blood results that are abnormal on discharge and do not wish to receive normal bloods. Overall GPs want concise information regarding admission and discharge and have no interest in detailed accounts of the patients admission.

70 % of GPs received the EDS within 2 weeks, with the remaining 30 % unsure how long the EDS took to arrive to their practice. When asked the ideal timeframe for receipt of the EDS, 77 % felt that they should receive it on the day of discharge with the remainder happy to receive it within 1 week.

All GPs surveyed (100 %) found the electronic prescriptions and medications stopped or held section useful. They would all like to receive the EDS electronically if that were to become available in the future.

We interviewed 13 GPs from three large primary care centres which account for a substantial number of patients attending our institution. Although a relatively small

number, these were chosen as they dealt primarily with Portiuncula Hospital in their practices and were able to give opinions based on their experience of high volumes of discharge letters, both paper-based and electronic.

The new system required that the task of coding the diagnoses of the patient using the ICD-10 classification was undertaken by NCHDs. This had previously been done by specialized HIPE coders. Our audit of the accuracy of coding by NCHDs compared to HIPE coders showed a dramatic drop in accuracy of coding. NCHDs had an accuracy of just 30 % compared to 95.6 % when done by a trained coder. This has implications for accuracy of discharge data being received by GPs but also for hospital funding [18]. HIPE data is a crucial element of hospital funding and is the basis on which hospitals receive funding for the work that they do. This dramatic drop in accuracy has shown that this task does indeed require specialized training and is not appropriate to be done by NCHDs. This finding has since resulted in the dropping of ICD-10 coding from the discharge prescription and the replacement by free text diagnosis, with subsequent coding carried out by coders.

A fully integrated EHR would have multiple potential benefits. It has been shown that it would lead to savings of about \$1 billion per year if introduced into all hospitals in the US and eliminate up to 200,000 adverse drug events [19]. Ultimately, the ideal scenario is a situation where there is a completely paper-less, fully integrated health system with electronic health record as standard whereby the GP would be able to access the patient's discharge summary electronically immediately on discharge; however, significant progress using electronic discharge and prescriptions has been made.

#### Compliance with ethical standards

**Funding** This study received no funding.

**Conflict of interest** Stephen Murphy declares that he has no conflict of interest. Laura Lenihan declares that she has no conflict of interest. Felix Orefuwa declares that he has no conflict of interest. Geraldine Colohan declares that she has no conflict of interest. Ita Hynes declares that she has no conflict of interest. Chris Collins declares that he has no conflict of interest.

**Ethical approval** This article does not contain any studies with human participants or animals performed by any of the authors.

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