Clinical handover incident reporting in one UK general hospital

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Abstract

Objective. To determine the prevalence and characteristics of clinical handover incidents that occurred across a medium-size UK hospital.

Design. A retrospective review of 36 consecutive months of data from the hospital electronic database of critical incidents was conducted.

Main Outcome Measures. Number of incidents reported, characterization of handover incidents according to clinical setting, severity and type of incidents.

Results. We identified 334 handover incidents. The number of reported incidents increased over the 3 years. The transfer of patient care within the same specialty accounted for 51% (170) of incidents of which 75% (143) occurred during a change of shift. The specialties reporting the highest number of adverse events were: Obstetrics and Gynaecology, 42% (140); Medicine for the Elderly, 12.2% (41) and General Medicine, 12% (40). The most common types of handover incident scenario were poor or incomplete handover, 45% (151) and no handover of a patient at all, 29% (98). Reported severity was generally low (99%).

Conclusions. Current reporting rate is low if compared with prospective studies highlighting an issue of under-reporting. Many incidents appear to be of modest harm for patients because of response time; however, further research is required to assess potential severity and level of harm linked to low-quality handovers.

Keywords: clinical handover, handover incidents, incident reporting, patient safety

Introduction

Clinical handover is a critical component of health-care quality and safety. During their journey throughout the hospital, patients are exposed to several transfers across different areas of diagnosis and levels of care. At each stage of the process, information about their health needs to be communicated among hospital staff at shift changes and within shifts. When patient information is transferred, clinical handover occurs. Achieving high-quality clinical handover requires an understanding of its core elements, which go beyond the simple transfer of information and involve effective communication and clear transfer of responsibility.

Several initiatives in the last few years have underlined the increasing attention paid to this central element of inpatient care both nationally and internationally [1–4]. Only a few studies so far have examined the nature of problematic handovers focusing on the association between handovers and adverse events [5–8]. There is not established evidence on the impact of handover incidents on patient safety and little is known regarding the prevalence and types of incident that occur during handover in hospital settings. The aim of the study was therefore to provide an overview of handover incidents that occurred across a medium-size UK hospital and to describe common hazardous scenarios by type, location and severity.

Methods

Critical incident reporting system

The study setting was a medium-size general hospital (600 beds) in an urban area in the South-East of England. The Trust-wide clinical incidents reporting system (Datix database) was introduced in January 2001 aiming to identify both
clinical and non-clinical incidents and allow departments to learn from the incidents reported. In 2008 the Risk Management Department undertook a further development of the system, allowing incidents to be reported on-line as well as using paper forms; furthermore all staff received training on reporting by using the new Datix.

Entries in the system are voluntary and anonymous. Incident forms can be filled in by any staff member by paper incident form or submitted on-line to the Risk Management Department. Specifically, incident forms contain the following information: details of the person involved; exact location of where the incident occurred; date and time of incident; type of incident—clinical or non-clinical; factual description of what happened; the impact of any injury on the individuals and the signature of the professional completing the form. Staff members can classify the incident according to the categories supplied by the Datix. Rating of severity is based on the adverse consequence(s) that might arise from incidents and the system assigns scores according to three levels: low, medium, high. Low severity means that the impact on a patient is a minor injury requiring minor intervention; medium severity indicates a moderate injury requiring professional intervention; high severity refers to an incident leading to death or to multiple permanent injuries with irreversible health effects.

**Search strategy**

A retrospective evaluation of critical events occurring over a 3-year period (1 October 2006 to 31 September 2008) was conducted by our research team through the examination of the hospital electronic record of clinical incidents. In order to identify adverse events related to handover, we used the database search codes for doctors’ and nurses’ handover as well as searching for incidents related to patient transfer using a set of keywords.

Search terms were as follows: handover, shift, information, communication, on call, service delay, referral, responsibility and accountability. For reasons of confidentiality, the principal investigator (C.P.) abstracted all reports. To affirm inter-rater reliability a second reviewer, a senior consultant (F.S.) with patient-safety research experience, re-abstracted 10% of reports. The search strategy is summarized in Fig. 1.

We obtained ethical approval for this research from both the Regional NHS Research Ethics Committee and the Research and Development department at the hospital.

**Selection criteria of reports**

All incident reports were selected according to the widely accepted definition of clinical handover provided by the Australian Medical Association [9]. A handover incident was therefore recognized as any event in which the reporting person clearly described or mentioned:

(i) Verbal communication failures during the transfer of patient care, including information not shared about medical history or planned intervention.

(ii) Poor transfer of historical information or related to planned intervention in both paper-based and electronic handover forms, including incidents where staff taking over did not receive a level of information adequate to the patient’s needs.

(iii) Lack of clear transfer of professional responsibility and accountability from one professional to another. This criterion includes referral as it involves the handover of a patient from one health-care provider to another to ensure that the appropriate patient care can continue following that transfer of responsibility.

**Characterization of clinical handover**

We carried out a content analysis [10] to determine the prevalence and characteristics of handover incidents. Classification of handover types was drawn by our multidisciplinary team composed of two physicians (F.S., J.P.), a pharmacist (S.D.) and a human factor expert (H.M.). We then compared these categories and agreed upon a final set as shown in Table 1.

In order to test the accuracy and appropriateness of the categories identified we initially reviewed 10% of reports and no amendments were necessary. All reports were then independently analysed by C.P. and a second reviewer (F.S.). The prevalence of incidents was determined by the number of incident which fell under each category.

**Data analysis**

We recorded data in the spreadsheet Microsoft Excel and subsequently analysed with the statistic package SPSS 14 for Windows to report descriptive statistics. Furthermore, we
used one way chi-square to compare the number of incidents reported across the 3 years of study period and Cohen’s kappa of agreement to compare the degree of consensus between the two raters (C.P. and F.S.).

Results

Occurrence of handover incidents

Through the keyword search we retrieved a total number of 2729 incident reports. After further screening we identified 334 handover incidents accounting for 2% of all clinical incidents reported in the same period (19,339). The number of handover incidents increased over the 3 years \( (P, 0.01) \).

Characterization of incidents: types and clinical setting

The transfer of patient care within the same speciality (intra-speciality) accounted for 51% (170) of incidents; inter-speciality, 29% (98); hospital to community, 15% (50); inter-hospital, 4% (13); and ambulance to specialty, 1% (3) of incidents. Within the category intra-speciality, 75% (143) of incidents occurred during the change of the shift (shift to shift handover) and 25% (42) during patient transfer between wards of the same speciality. Inter-rater reliability was \( k = 0.991 \) (95% CI, \( \sim 0.97, 1.000 \)).

Over the years the speciality that reported the highest number of incidents was Obstetrics and Gynaecology, 42% (38), followed by Medicine for the Elderly, 12.2% (8) and General Medicine, 12% (6). Table 2 summarizes the prevalence of handover incidents across all specialities.

Severity of incidents

For most handover incidents (99%), the reported severity was low; the extract from the only incident that was rated as having medium severity is reported in Box 1.

**Box 1** Handover incident rated as having medium severity (extract from handover incident reporting form)

06/07/06. Patient taken off ward. Had CT scan. Team not alerted to urgent nature of scan result or made aware that scan had even been done. Hard copy of scans found today 10/07/06 in radiology department. Scan showed moderate-to-large sub-dural haematoma with midline shift.

Table 2  Prevalence of handover incidents across specialities

<table>
<thead>
<tr>
<th>Speciality</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Assessment Unit</td>
<td>4</td>
<td>6</td>
<td>0</td>
<td>10</td>
<td>3.0</td>
</tr>
<tr>
<td>Coronary Care Unit</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>1.2</td>
</tr>
<tr>
<td>Orthopaedics</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>4</td>
<td>1.2</td>
</tr>
<tr>
<td>Accident and Emergency</td>
<td>4</td>
<td>9</td>
<td>13</td>
<td>26</td>
<td>7.8</td>
</tr>
<tr>
<td>Intensive Therapy Unit</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>1.5</td>
</tr>
<tr>
<td>Surgery/Operating Theatre</td>
<td>8</td>
<td>7</td>
<td>0</td>
<td>20</td>
<td>6.0</td>
</tr>
<tr>
<td>General Medicine</td>
<td>6</td>
<td>12</td>
<td>22</td>
<td>40</td>
<td>12.0</td>
</tr>
<tr>
<td>Neonatal Care</td>
<td>1</td>
<td>3</td>
<td>11</td>
<td>15</td>
<td>4.5</td>
</tr>
<tr>
<td>Obstetrics and Gynaecology</td>
<td>38</td>
<td>36</td>
<td>66</td>
<td>140</td>
<td>41.9</td>
</tr>
<tr>
<td>Medicine for the Elderly</td>
<td>8</td>
<td>16</td>
<td>17</td>
<td>41</td>
<td>12.2</td>
</tr>
<tr>
<td>Paediatrics</td>
<td>6</td>
<td>4</td>
<td>9</td>
<td>19</td>
<td>5.7</td>
</tr>
<tr>
<td>Others(^a)</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>10</td>
<td>3.0</td>
</tr>
<tr>
<td>Total</td>
<td>82</td>
<td>104</td>
<td>148</td>
<td>334</td>
<td>100</td>
</tr>
</tbody>
</table>

\(^a\)Others include specialities that reported no more than two incidents each from 2006 to 2008: high dependency unit, speech unit, image, anaesthetic unit, ambulance, oncology unit, ophthalmic unit, COBHAM unit (private NHS).

Table 1  Handover categories identified by a multidisciplinary team

Inter-speciality refers to the transfer of patient care between two or more different specialities, i.e. Obstetrics to Medicine.

Intra-speciality refers to the transfer of patient care within the same speciality, i.e. Obstetrics to Delivery Suite. Subcategories:

Intra-units (transfer of patient care between wards that are part of the same speciality, i.e. different wards of the Department of Medicine for the Elderly).

Shift to shift (transfer of patient care between two different teams of professionals during the change of shift; i.e. the outgoing personnel and incoming personnel).

Ambulance to specialty refers to the transfer of patient’s care between the ambulance crew and the Accident and Emergency staff or, occasionally, between the ambulance crew and wards.

Community to hospital/hospital to community refers to the transfer of patient care between hospitals and primary care or all cases that require continuity of care after the patient has been discharged, i.e. home visits of community midwives to a new born baby and mother.

Inter-hospital refers to the transfer of patient care between two hospitals.
Table 3 Type of handover incident scenarios

<table>
<thead>
<tr>
<th>Type of incident</th>
<th>Description</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>No handover of the patient</td>
<td>Incidents where patients were admitted to wards without the staff being</td>
<td>98</td>
<td>29.3</td>
</tr>
<tr>
<td></td>
<td>informed or were not handed over during the change of the shift or at the</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>weekend.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor/incomplete handover</td>
<td>Incidents where essential elements of patient’s care, such as the presence</td>
<td>151</td>
<td>45.2</td>
</tr>
<tr>
<td></td>
<td>of viral diseases or of diabetes were not handed over. Also includes absence</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>of a clear diagnosis and care plan for the patient; drug charts not updated,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>not signed or missing.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Handover issues at discharge</td>
<td>Incidents where patients who needed home visits have been discharged</td>
<td>39</td>
<td>11.7</td>
</tr>
<tr>
<td></td>
<td>without the relevant staff having been informed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No action taken</td>
<td>Incidents where the action appropriate to patient’s need did not take place</td>
<td>21</td>
<td>6.3</td>
</tr>
<tr>
<td></td>
<td>despite the handover of outstanding jobs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wrong action taken following handover</td>
<td>Incidents where an action not appropriate to the patient’s needs was taken</td>
<td>4</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>despite clear instructions at handover.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorrect information transferred at</td>
<td>Incidents where the information transferred at handover was not correct or</td>
<td>12</td>
<td>3.6</td>
</tr>
<tr>
<td>handover</td>
<td>did not reflect the current situation of the patient.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No referral/poor referral</td>
<td>Incidents where patients were poorly or not referred to other health</td>
<td>6</td>
<td>1.8</td>
</tr>
<tr>
<td></td>
<td>professionals when needed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missing patient</td>
<td>Incidents where patients got lost during the transfer within the hospital</td>
<td>3</td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td>and were not physically found in the admitting department or ward.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>334</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4 Extracts from incident reports illustrating the most common handover incidents scenarios

No handover

Patient admitted from X on 15/07/08—not seen by any doctor until 21/07/08—team not informed of this patient.

Poor/incomplete handover

Patient received from X into ward bay y who is MRSA positive. The staff were not informed of MRSA status. X staff had this information and did not hand over to the ward staff.

Handover issues at discharge

Patient with severe depression—not seen for 3 weeks, postnatally. Midwife was not aware of discharge. No communication of previous depression. Postnatal depression with this child, she feels like running away.

No action taken following handover

Seen by senior doctor on ward round—am. Care taken over on late shift. Midwife noted that none of senior doctor’s instructions undertaken by doctors on duty in the morning.

Wrong action following handover

Patient commenced on emergency central feeding regime on 21st. Informed by nurse to assess. Patient has been given incorrect feed despite clear instructions at handover on regime.

Incorrect information transferred at handover

Care taken over on night shift, told at handover that no perineal suturing require as small tear no bleeding. On examination 4th degree tear diagnosed.

No referral

Patient attended anticoagulant clinic today when looking at his yellow warfarin book. It was identified that patient had been in hospital 09/10/05 with a paracetamol overdose but that the patient had not been referred back to the care of the anticoagulant clinic. So attended his original appointment which was 5 weeks later.

Missing patient

Whilst checking the bed state on Ward x, unable to find the location of a patient, although the senior midwife stated that the patient has been transferred to ward y. Ward y stated that they did not have this patient.

Discussion

This study describes prevalence, type, setting and degree of severity of handover incidents identified on a large NHS database. It emerged that handover incidents accounted for 2% (334) of the total adverse events occurred during the study period. Despite the fact that the number of incidents reported increased over the 3 years, reflecting both the
general rise in the number of reporting programmes promoted by health-care organizations [11] and the growing participation of the hospital in patient safety initiatives, this figure still seems low if compared with prospective studies. In a survey of US hospital residents, 50% of respondents experienced at least one incident of handover-related patient harm over 1 month [12], yet Borowitz et al. [8] identified that 31% of doctors reported having had handover issues when they were on call, due to lack of information received. On the other hand, under-reporting has been recognized as a significant limitation of hospital reporting systems [13], and disagreement over the definition of an error represents a major cause of not reporting in medical settings [14]. This could be particularly true for clinical handover as a clear taxonomy of errors has not been developed yet.

The highest rate of incidents was related to transfer of patient care within the same specialty especially during the change of the shift. This confirms the findings of a survey conducted by the Victorian Quality Council [15] where shift to shift represented the most problematic area both for doctors and nurses. Yet, shift to shift handover has been identified in the literature as a high-risk area as linked to lack of structure, policies and procedures but also medical discretion and uncertainty over responsibility [16].

However, a mixture of contributory factors might have affected such results. It is relatively easier to access the reporting system when incidents happen within the ward compared with incidents that happen during transfer between hospital and community, at discharge or in an emergency situation. Nevertheless, is likely that both paramedics and Accident and Emergency (A&E) personnel use more structured protocols and systematic checklists compared with other doctors and nursing staff, as handing over patients represent a major aspect of their job and this handover has time restrictions. It might also be suggested that the handover within hospital involves more complex diagnostic and treatment regimens than is typically required during transfer to A&E.

Finally, changes of the shift happen invariably every day up to three times per day and therefore handovers happen more frequently in the wards than in any other setting.

In terms of clinical speciality, Obstetrics and Gynaecology reported the highest rate of incidents with the vast majority of reports coming from the delivery suite. This can be explained by the fact that treatment and diagnosis of mother and child during pregnancy require health-care providers with the ability to manage two patients simultaneously, therefore doubling the chance of errors. General Medicine and Medicine for the Elderly reported a high rate of incidents as well; this could be due to the relevant presence of comorbidities that require to be treated by several specialists. In such context, multidisciplinary staff need to exchange information more frequently and rapidly with each other about multiple issues necessitating the ability to communicate outside one’s professional discipline [17]. Moreover, a proactive approach and a well-established patient safety culture could have determined the observed rate of reports.

The most frequent types of incident were incomplete handover or no handover at all. These events led to a variety of health-care hazards including overlooking crucial elements of a patient’s condition such as the presence of a viral disease or of diabetes. Also, the lack of handover resulted in admitting patients without the staff being informed or in failing to review critical patients. That said, the reported severity of incidents was generally rated as low. It is likely that more serious outcomes have been prevented by competent and timely interventions so minimizing the harm to patients. Broadening the targets of incident reporting by including the analysis of near-misses would offer several advantages to the understanding of handover pitfalls. In fact, these events occur up to 300 times more frequently than adverse events [18, 19], they are less likely to activate the psychological barriers to reporting and involve little medical–legal risk [20].

Limitations

The findings of our study should be considered in light of its limitations. First, data were abstracted from one medium-size hospital where the performance of the reporting system might be different from other hospitals. Nevertheless, many patient safety studies address one hospital only [21–24]. Secondly, data collected by the system might have been biased due to lack of feedback, time constraint and unsatisfactory reporting processes [22]. Finally, we used incident reports as a source of information to identify the prevalence of handover incidents. Not all incidents that occur are reported [25] and reporting might not provide a clear picture of handover performances [26]. Even so, in medicine, there is a long tradition of examining past practice to understand how things might have been done differently [27] and incident reporting systems remain an important and relatively inexpensive means of capturing data on errors and adverse events in medicine [13].

Conclusions

This study provides a classification of handover incidents and describes common hazard scenarios resulting from low-quality handover. It offers a snapshot of potential scenarios that might compromise a patient plan of care and staff optimal performance in hospitals also providing information on the impact of handover incidents on patient safety. Prospective studies should be carried out in support of retrospective data in order to provide an accurate picture of current handover practice in the NHS.

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