Original research article

Is handover in facilitating care, a neglected domain? A case from a multi-specialty Hospital of India

Dr. Vibhisha Khatri, Dr. Neetu Purohit

1Student, IIHMR University, Jaipur, India
2Assistant Professor, IIHMR University, Jaipur, India
Corresponding author: Dr. Neetu Purohit

Abstract:

Objectives: Primary objective: To assess the compliance with the handover protocols for intra and inter departments and highlight the role of handover in continuity of patient care in terms of actual and estimated medical errors
Secondary objective: To identify the areas with maximum negligence and its likely implications on patient care.

Study design and setting: A cross sectional observational study was carried out in a 300 bedded multispecialty hospital in one of the metropolitan cities of India. Nine months IPD records of patients constituted the sample framework, of which 100 cases were selected using systematic random sampling.

Study sample: Overall, 700 movements were captured through the analysis of 100 IPD cases in 11 critical and non-critical departments of the hospital and 1800 cases were reviewed to calculate the incidence of medical errors.

Results: More than 35% of the medical errors cases were due to poor handover. Considering all cases, the proportion of estimated medical errors due to handover reaches as high as 3000 cases per one lakh cases. The compliance of doctors in critical areas-Emergency, ICU, Recovery Room and Heart command centre was found to be 90%, 79%, 79% and 80% respectively which is more than that of non-critical areas (42% in both Wards and Cath recovery)

Conclusion: It is critical to appreciate the importance of handover communication in avoiding preventable medical errors. Handover process and practices need to be made uniform using standard operating procedures in all hospitals to ensure quality in patient care at all levels.

Key words: Handover, patient safety, medical errors, compliance, critical areas

Introduction

Communication is the foundation of partnerships between the patient, family, and clinicians and affects the safety and quality of care received during the hospital stay [1]. Communication between health care workers accounts for the major part of the information flow in health care. It is truism to mention that effectiveness of all hospital-based interaction between patient-provider or provider-provider is based on effectiveness of communication. There is growing evidence which indicates that errors in communication give rise to substantial clinical morbidity and mortality [2].

Health care is complex and unpredictable, with professionals from a variety of disciplines involved in providing care at various times throughout the day, often dispersed over several locations, creating spatial gaps with limited opportunities for regular synchronous interaction [3]. Break downs in communication could lead to more than 70% of adverse events in a hospital [4].
Communication failures lead to increases in patient harm, length of stay, and resource use, as well as more intense caregiver dissatisfaction and more rapid turnover [5,6,7,8,9,10]. In multisite studies of intensive care units (ICUs), poor collaborative communication among nurses and physicians, among other specific factors, contributed to as much as a 1.8-fold increase in patient risk-adjusted mortality and length of stay [11,12,13]. A proactive streamlined mechanism to ensure clear and unambiguous communication has been recognized as of utmost importance.

Communication between Primary Care Physicians (PCPs), specialists and other practitioners is the hallmark of effective follow-up care and improved patient safety. Research conducted during the 10-year period of 1995-2005 demonstrated that ineffective team communication was the root cause for nearly 66 percent of all medical errors during that period. It illustrates that loss of communication among health care team members almost surely lead to loss of patient care [14].

A recent study in 2015 in Mulago Hospital, Uganda revealed that even patients perceived duty handovers (shift change, duty transfers and health worker sign-offs) as triggers for several problems that affected quality of care, created gaps in continuity of care, and increased patient morbidity or mortality [15].

Both verbal and non-verbal communication is practiced in hospitals. Verbal handovers are often incomplete, with the omission of pertinent information, coupled with poor retention of information by the incoming care provider [16].

While, evidences have been presented which shows that communication between healthcare providers is a fundamental component of patient care and communication over handover is critical for ensuring continuity of care [17], it is becoming increasingly apparent that a breakdown in communication system occurs in hospitals and this compromise the patient safety [18].

A study in a general hospital in UK identified handover incidents over a period of three 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 [19]. Absent or inaccurate information can have deleterious effects on patient care. The objectives of the present study were to assess the compliance with the handover protocols for intra and inter departments and to highlight the role of handover in continuity of patient care in terms of actual and estimated medical errors. The study also identified the areas with maximum negligence and its likely implications for patient care.

**Methods**

The study was conducted in a 300 bedded Multispecialty Hospital in summers of 2016. An audit of 100 IPD records was done to assess the compliance of handover documentation during shift change and patient transfers. IPD records of patients admitted up to nine months prior to the study constituted the sample framework and were selected using systematic random sampling. Overall, 700 movements were captured through the analysis of 100 IPD cases. Further, in the process, 100 IPD cases were analyzed for handover documentation process by 11 different departments which included three ICUs, two recovery rooms, wards, two Heart command centers, Cath Recovery room and one Emergency room. Compliance for handover documentation was checked for both inter and intra departmental transfers.
Conceptual and operational definition of clinical 
Handover and compliance

A clinical handover is defined as “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” [20]

A patient handoff serves several functions: [21]

- Transfer of Responsibility for patient care: passed from one clinician or clinical team to another.
- Transfer of Data: pertinent data about patient (age, blood type, etc.), his condition (symptoms, vital signs), test results, and procedures performed are transferred via speech, paper, or information system (often via two or three of these media).
- Transfer of Information: Information (as opposed to specific facts) regarding caregiver plans for tests and/or procedures to be performed is conveyed via paper form or a clinical information system.
- Conveyance of Clinical Judgment: Assessments of patient condition, prognosis, and other aspects are conveyed, usually via speech.

To assess compliance for handover, operational definitions were decided based on below mentioned criteria:

- Complete compliance: If the patient information, transfer details, current condition of the patient, medication, lab test results, nutrition, management plan and other relevant details were completely filled in the form and were duly signed and dated by the transferring doctor and nurse and receiving doctor and nurse.
- Partial compliance: If any one or two of the above details were missing or the form was signed by only one doctor and nurse.
- No compliance: If more than three of the above details were not filled and signature of one of the doctors or nurses or both the doctors and nurses was found missing.

Results

With respect to proportion of medical errors in the hospital and the role of handover in it, a preliminary analysis revealed that more than one third of the medical errors were due to poor handover. On further investigation, the availability of standardized handover forms was found to be playing a role in determination of handover compliance. Since compliance could be assessed only against some evidence, the assessment was accordingly carried out and the results have been presented for handover errors, handovers compliance assessment during shift changes and inter department changes.

1) Proportion of Medical Errors and Handover Lapses

The hospital records of nine months prior to the study were explored. As per hospital policy, every month a total of 200 cases were selected at random and reviewed to check for possible medical errors. The table (Table 1) shows the status for the nine months and the causes which led to the errors. It details out on total medical errors during the period September, 2015 to May, 2016, the description of the error and errors specific to poor handover.

Table 1 shows that overall, 1800 cases were reviewed, out of which the incidence of medical errors was found in 7% of the cases. On further categorization of errors, it was revealed that more than one third of the cases (35%) were due to poor handover. Figure 1 shows the number of medical
errors due to handover. Though the number is small, the percentages have been calculated to highlight the potential risk which poor handover poses. Considering all cases, the proportion of estimated medical errors due to handover reaches as high as 3000 cases per one lakh cases. This needs to be attended to.

**Table 1:** Percent Medical errors, handover errors and description of errors in 300 bedded specialty Hospital (September, 2015 to May, 2016)

<table>
<thead>
<tr>
<th>Months</th>
<th>Total Errors (N=200 per month)</th>
<th>% of medical error</th>
<th>Errors due to Handover failure</th>
<th>% medical errors due to handover failure</th>
<th>Description of errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sept 15</td>
<td>15</td>
<td>7.5</td>
<td>9</td>
<td>60</td>
<td></td>
</tr>
</tbody>
</table>
  • In two cases drug was administered with wrong frequency.  
  • In six cases, wrong dose of drug was given  
  • In one case wrong medicine was administered. |
| Oct 15  | 10                            | 5                 | 1                             | 10                                     |  
  • Wrong documentation of drug |
| Nov 15  | 15                            | 7.5               | 9                             | 60                                     |  
  • In two cases medicine was not administered  
  • In one case extra dose of drug was administered  
  • In one case, drug was given at wrong timing  
  • In rest of the cases drug was administered with wrong frequency |
| Dec 15  | 9                             | 4.5               | 2                             | 22                                     |  
  • In both the cases, the drug was not administered. |
| Jan 16  | 10                            | 5                 | 2                             | 20                                     |  
  • In both the cases, wrong drug was administered. |
| Feb 16  | 10                            | 5                 | 5                             | 50                                     |  
  • In four cases, the drug was not administered and in one case, the drug was administered with wrong frequency. |
| Mar 16  | 9                             | 4.5               | 2                             | 22                                     |  
  • In one case the drug was not administered and in the other case, an extra dose was administered. |
Table: Medical errors due to handover failure by months

<table>
<thead>
<tr>
<th>Month</th>
<th>Total Errors</th>
<th>Errors due to Handover Failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apr 16</td>
<td>119</td>
<td>42</td>
</tr>
<tr>
<td>May 16</td>
<td>29</td>
<td>14.5</td>
</tr>
<tr>
<td>Total(9 months)</td>
<td>160</td>
<td>56</td>
</tr>
</tbody>
</table>

- In two cases, drug was not administered.
- In one case there was wrong documentation.
- In two cases, wrong dose of drug was administered.
- In one case, the drug was not discontinued as instructed.
- In two cases, wrong drug was administered
- In three cases, wrong dose of drug was administered
- In one case, drug was administered with wrong frequency.

Figure 1: Medical errors due to handover failure by months
2) Status of Handover forms and compliance percent for shift changes

Though, the hospital management has to develop handover forms which could be used by the staff for handover documentation., of the 11 departments selected for the study, the forms were being used only in two departments-Gastro liver ICU(GLICU) and recovery room. The forms were not available in other departments; therefore, the researchers could not ascertain the compliance. When inquired, the staff of these departments reported that the handover was done through verbal communication. Since all accreditation boards emphasize written documentation, all these departments with verbal communication were not considered complaint and not further studied.

The two departments (GLICU and recovery room) which were further studied, even in them, the forms for doctors had not been developed and so not used. The nursing staff was found to be complying completely. As can be expected, the compliance proportion was found to be cent percent in these department for nurses but nil for doctors with respect to shift changes.

3) Status of Handover forms and compliance percent for interdepartmental transfers- Critical and non-critical areas and possible implication for non-compliance

It was found that for interdepartmental transfers, standardized forms for handover were available for all the departments studied. Compliance in interdepartmental handover communication was checked through the standard forms developed by the hospital for doctors and nurses.

The data revealed that compliance of handover in critical areas (like Emergency, Recovery room and Intensive care units) was more as compared to non-critical areas (Wards, Cath recovery). Further, analysis revealed that the documentation of handover by nurses was more compliant than the doctors both in critical and non-critical areas.

The handover documentation when patient was transferred between the departments (interdepartmental) was found to be more compliant in critical areas like Emergency, ICU, Recovery Room and Heart command centre was found to be 90%, 79%, 79% and 80% respectively than that of non-critical areas (42% in both Wards and Cath recovery) (Refer figure 2&3)

Handover compliance was more in nurses when compared to doctors (Emergency, ICU, Recovery Room and Heart command centre, Wards, Cath Recovery was found to be 95%, 83%, 94, 90%, 80% and 79% respectively). Refer figure 2& 3. Figure 2 shows that the handover compliance is maximum in emergency owing to the criticality of the area, followed by heart command centre, recovery room and ICU. However, there is a further scope of improvement which can be achieved by standardization of the process.

Figure 3 shows that in comparison to critical areas (figure 2), the compliance in non-critical areas is found to be less. Again, the compliance in documentation by nurses is more than the doctors.
Further, the researchers analysed the forms being used for handover with respect to accreditation standards. The forms were found to be complete as these had provision for documenting all the information which could ensure quality of care during patient transfers. For instance, the forms captured information on transfer details, current condition of the patients, medication, relevant lab results, management plan, nutrition, physician focus and handover details. Table 2 details out the likely adverse implications of missed or incomplete information on any of the above stated criteria.

Figure 2: Handover Compliance in Critical Areas(Inter-department)

Figure 3: Handover Compliance in Non-Critical Areas(Inter-department)
Table 2: Possible implications of non-compliant handover

<table>
<thead>
<tr>
<th>Components of handover form used by the Hospital</th>
<th>Importance/implication of missing Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Transfer details</td>
<td>• Misidentification.</td>
</tr>
<tr>
<td></td>
<td>• Hospital patient systems must ensure that administrative data is up to date 24-hours per day. If location and responsible consultant are not accurately recorded and readily accessible this exposes the patients and the hospital to considerable risk. (wrong treatment to wrong patient)</td>
</tr>
<tr>
<td>2. Current condition of the patient</td>
<td>• May hamper continuity of care.</td>
</tr>
<tr>
<td></td>
<td>• Physicians and nurses might miss out on emergency treatment if any.</td>
</tr>
<tr>
<td>3. Medication</td>
<td>• Problems that can arise from poor communication at handover include incorrect medications being given, delays in treatment or failure to give it.</td>
</tr>
<tr>
<td>4. Relevant Lab Results (Critical Results)</td>
<td>• Although most clinical laboratory results have therapeutic implications that do not require urgent physician attention, some test results may indicate a potentially life-threatening situation. These critical results require immediate notification and action by the responsible licensed healthcare provider.</td>
</tr>
<tr>
<td></td>
<td>• Delays and inaccuracies in reporting critical values place patients at risk of harm due to treatment delays, omissions, and errors.</td>
</tr>
<tr>
<td>5. Management Plan</td>
<td>• Continuity of care is at stake if management plan is not clear.</td>
</tr>
<tr>
<td>6. Nutrition</td>
<td>• If patients with specific diseases are not given specific diets and nutrition supplement, it can lead to life threatening complications.</td>
</tr>
<tr>
<td>7. Physician Focus</td>
<td>• Every doctor attending a patient can begin where the last one left off. Patient perception of professionalism is reaffirmed and improved.</td>
</tr>
<tr>
<td>8. Handover Details</td>
<td>• Accountability for the treatment of the patient is under question if handover details are not filled.</td>
</tr>
</tbody>
</table>
Discussion

Handovers occupies an important place in the health-care system as it happens multiple times in a single day for patients under hospital care. Handover occurs at different times, namely, shift changes, when clinicians take breaks, when patients are transferred within and between departments and during admission referral or discharge. The results showed that while proper documentation was followed in critical areas to ensure maintenance of certain standards, such mechanisms were found lacking to the expected level in non-critical areas of the hospital. This probably indicates while breakdown in communication in certain critical areas like ICUs, Emergency was given due importance as lapses in such areas could become a matter of concern and could cost life. In non-critical areas, such as wards, importance of handover is somehow less appreciated as the patient is relatively in a stable condition and communication lapses usually do not become life threatening.

What needs to be realized is that the care givers keep on changing and lapses of communication can put the patient at risk, even when the patient is not moving to different departments, is confined to same premises and is also in a non-critical area. The only way the risk could be minimized is by effective handover during shift changes so that there is no breach in continuity of care.

It is important to emphasize that communication in terms of handover plays an equally crucial role in non-critical centers also. The tables and figures shown above clearly indicate that simple negligence could result into fatal episodes. In medical care, each aspect is important in achieving the cure. Unfortunately, the departments dealing with near fatal critical cases are perceived as a priority. This results in overlooking of so called un-important or time-taking recordkeeping for handover. This negligence has the potential of deteriorating a non-critical case to critical case. During the transfer of cases, the need for clarity in sharing of information is to such an extent that it is as good as care being received single handedly. The chain of communication should be as good as being taken care of by one single person.

However, the findings show that documentation is not given due importance. Involvement of the doctors as true stakeholders of communication could ensure complete and seamless handover. The steps taken to ensure quality and patient safety need to be communicated to the doctors not as mere administrative requirement for accreditation et al rather as a critical requirement for patient care.

Further, the implications of lapses need to be communicated to the medical staff, particularly doctors so that they are convinced of the various requirements and perceive them more than a mere administrative formality. It is quite reasonable to assume that no medical staff- nurses or doctors would be reluctant to follow the procedures if they are made to understand the criticality and implication of non-compliance.

The same can be understood by considering the probable reasons of non-compliance extended in terms of shortage of staff and work load. While there is no denying of the fact that shortage of staff and over load are great de-motivators, it is also true that the compliance is high in critical areas which too face the same problems.

The difference perhaps is sensitizations of the staff regarding the necessity of compliance without fail.
modern times, where Electronic Medical Records are being implemented in hospitals for ease of documentation and decreasing work load, development and incorporation of electronic handover tools in EMR can help to overcome the deficits of variable and unstructured forms of clinical handover [22,23,24,25].

Unfortunately, the approach used by the hospital management in ensuing compliance fails to consider the doctor-patient relationship and treat it as an administrative compulsion. Handover compliance can become a norm rather than an exception even in a staff constrained situations if handover is perceived not an administrative requirement alone but a prerequisite of patient safety.

Conclusion
Understanding the importance of handover communication and ensuring standardized ways to document it, is the need of the hour to avoid preventable medical errors. Hand over process and practices need to be made uniform using standard operating procedures in all hospitals so that communication breakdown is put to halt and safety and quality in patient care could be ensured at all levels.

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