Published in final edited form as:

J Surg Res. 2017 June 15; 214: 86–92. doi:10.1016/j.jss.2017.02.069.

Assessing written communication during interhospital transfers of emergency general surgery patients

Felicity N.R. Harl, BSN, Megan C. Saucke, BA, MA, Caprice C. Greenberg, MD, MPH, and Angela M. Ingraham, MD, MS*

Department of Surgery, University of Wisconsin School of Medicine and Public Health, Madison, Wisconsin

Abstract

Background—Poor communication causes fragmented care. Studies of transitions of care within a hospital and on discharge suggest significant communication deficits. Communication during transfers between hospitals has not been well studied. We assessed the written communication provided during interhospital transfers of emergency general surgery patients. We hypothesized that patients are transferred with incomplete documentation from referring facilities.

Methods—We performed a retrospective review of written communication provided during interhospital transfers to our emergency department (ED) from referring EDs for emergency general surgical evaluation between January 1, 2014 and January 1, 2016. Elements of written communication were abstracted from referring facility documents scanned into the medical record using a standardized abstraction protocol. Descriptive statistics summarized the information communicated.

Results—A total of 129 patients met inclusion criteria. 87.6% ($n = 113$) of charts contained referring hospital documents. 42.5% ($n = 48$) were missing history and physicals. Diagnoses were missing in 9.7% ($n = 11$). Ninety-one computed tomography scans were performed; among 70 with reads, final reads were absent for 70.0% ($n = 49$). 45 ultrasounds and x-rays were performed; among 27 with reads, final reads were missing for 80.0% ($n = 36$). Reasons for transfer were missing in 18.6% ($n = 21$). Referring hospital physicians outside the ED were consulted in 32.7% ($n = 37$); consultants' notes were absent in 89.2% ($n = 33$). In 12.4% ($n = 14$), referring documents arrived after the patient's ED arrival and were not part of the original documentation provided.

Conclusions—This study documents that information important to patient care is often missing in the written communication provided during interhospital transfers. This gap affords a foundation for standardizing provider communication during interhospital transfers.

*Corresponding author: Department of Surgery, University of Wisconsin-Trauma and Acute Care Surgery, G5/342 CSC, 600 Highland Ave., Madison, WI 53792-3236. Tel.: +1608 262-6246; fax: +1608 252-0923. ingraham@surgery.wisc.edu (A.M. Ingraham).

Authors' contributions: A.M.I., F.N.R.H., and M.C.S. contributed to the conception and design of the study. F.N.R.H. and M.C.S. acquired the data. A.M.I., C.C.G., F.N.R.H., and M.C.S. analyzed and interpreted the data. A.M.I., F.N.R.H., and M.C.S. drafted the manuscript. A.M.I., C.C.G., F.N.R.H., and M.C.S. critically revised the manuscript and provided final approval of the manuscript.

Disclosure

The authors reported no proprietary or commercial interest in any product mentioned or concept discussed in this article.

Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.jss.2017.02.069>.

Keywords

Interhospital transfers; Communication; Emergency general surgery

Introduction

Communication among medical professionals is critical to providing high quality care. Poor communication leads to fragmentation of care and places patients at risk for adverse outcomes.¹ Fragmented communication can lead to delays in medical diagnosis and treatment.^{2–4} Failures in communication are the number one cause of adverse hospital events and are largely preventable.^{5,6} Up to 54% of process failures—“medical care (being) omitted, performed incorrectly, or incomplete”—in the clinical setting are due to communication failures and delays.⁵ In one study, as many as 75% of patients experienced adverse clinical incidents related to communication failures in the perioperative setting, such as forgotten equipment checks, medication errors, or not receiving deep vein thrombosis prophylaxis.⁶

Communication is particularly important during transitions of care. Transitions are a vulnerable point at which information vital to patient care may be omitted or misunderstood.^{7,8} Previous studies have documented that communication during transitions of care within a single institution as well as between acute care facilities and skilled nursing/rehabilitation facilities is generally poor.^{3,4,9} Important information can be forgotten and/or reported inaccurately or incompletely.^{6,10} Important information being “buried” within an abundance of extraneous information has also been identified as a reason for communication failure.¹¹ One study found that the volume of information on patients being transferred to a skilled nursing facility often exceeded 80 pages and was associated with significant delays in care and difficulty achieving safe, successful transitions.⁴

Few studies have assessed the communication that occurs during transfers between acute care facilities (interhospital transfers), which are likely at highest risk for communication failure due to changes in the medical setting as well providers.¹² The purpose of this study was to critically assess the written communication provided during interhospital transfers of emergency general surgery (EGS) patients. We defined written communication as the documents from the medical record that are compiled by the transferring facility and physically accompany the patient to the accepting hospital or are faxed to the accepting hospital after patient arrival. We hypothesized that the written communication is often incomplete regarding the workup performed, diagnosis reached, and treatment provided at the referring facility and that the documentation that is provided frequently contains duplicative or extraneous information.

Methods

Study population

We performed a retrospective review of the written communication provided by referring hospitals during interhospital transfers of EGS patients. The study population was comprised

of adult patients transferred to the Emergency Department (ED) of our 505-bed regional referral, tertiary care center from outside EDs for evaluation by an emergency general surgeon between April 1, 2014, and March 1, 2016. Patients with one of six EGS diagnoses (appendicitis, cholecystitis, diverticulitis, bowel obstruction, perforated viscus, and mesenteric ischemia) according to accepting physician documentation were included. These diagnoses were selected because they commonly precede one of the seven operations recently identified to account for the majority of morbidity, mortality, and cost associated with EGS diagnoses.¹³ This study was approved by the University of Wisconsin Institutional Review Board. A waiver of informed consent was obtained for all components of the study. Study data were collected and managed using Research Electronic Data Capture (REDCap) electronic data capture tools hosted at the University of Wisconsin.¹⁴ REDCap is a secure, web-based application designed to support data capture for research studies.

Data abstraction

At the University of Wisconsin (UW) Hospitals and Clinics, referring facility documents are scanned and uploaded into the patient's electronic medical record (EMR). It is hospital protocol that this information is scanned on arrival into the UW ED. If the information is not scanned in the ED, it is scanned either when the patient reaches the health care unit that he or she is admitted to or by the medical record department on discharge.

Standardized abstraction criteria were developed specifically for this study with guidance from the literature and input from physicians with clinical and research efforts focused on transitions of care. The full list of elements abstracted can be found in the On-line Appendix. Elements examined in the final analysis included the presence of outside records, the total number of scanned pages, and the role (i.e., physician, nurse) of the author of the documentation. Documentation of the patient's medical care including the ED provider's history and physical (H&P), provider notes, the referring physician/physician extender's diagnosis, involvement of and documentation by consulting physicians, and the reason for transfer were abstracted. Provider notes were defined as notes related to the patient's medical course written by physicians, physician extenders, and nurses. The presence of H&Ps and provider notes was recorded separately because there were times when only an ED physician/physician extender's H&P was present and other times when the physician/physician extender's notes in the chart did not include the H&P. Laboratory results (complete blood count, lactate, basic metabolic panel, hepatic panel, prothrombin time, international normalized ratio, and urinalysis) were also recorded. Imaging performed at referring hospital was also examined including computed tomography (CT) scans (chest/abdomen/pelvis with and/or without intravenous and/or oral contrast), ultrasounds (US; complete, limited, or unspecified), and x-rays (2 views, kidney-ureter-bladder or unspecified).

We assessed the inclusion of extraneous and duplicated information in the referring facility documents. Extraneous information was defined as information not related to the referring facility encounter that prompted the transfer. Duplicated information was content that was included in more than one location in the referring facility documentation. Information was considered duplicated only if the content (e.g., laboratory values or physician's notes) was

identical to that which was present in another portion of the documentation. If the radiology and laboratory findings were included in H&P or consultation notes but were not repeated verbatim (e.g., copied and pasted into the document), they were not counted as duplicates. Any element of our standardized abstraction criteria could be considered duplicated information. The number of pages of extraneous and duplicated information was counted, rounding to half and whole pages.

To determine the timeliness of the information transferred, we recorded if information reached UW after the patient's arrival to the UW ED. We determined if the information arrived at UW after the patient through the date and time stamps on faxed documents. If a fax date and time was after the patient's recorded date and time of arrival to the UW ED, it was concluded that the information arrived after the patient.

Statistical analysis

Comprehensive descriptive statistics were utilized to summarize the information communicated in the transfer. Completeness and efficiency scores were calculated for each chart to further characterize the documentation provided from the referring facility. The completeness score, on a scale from 0 to 4, was determined by giving one point for the presence of each of the following elements: ED physician/physician extender's H&P, provider's notes, referring diagnosis, and reason for transfer. These elements were selected for the completeness score with equal weighting because they were deemed by clinical and research advisors to be the most basic or essential elements of written interhospital communication. The ED physician/physician extender's H&P and provider's notes were both included in the completeness score due to the following logic. Although an H&P was not always included in the physician/physician extender's documentation, provider's notes did contain information that detailed elements of the patient's medical course and care. To only record the presence of the H&P would sacrifice noting the documentation that was provided within these other provider's notes. At the same time, not distinguishing the presence of the H&P separately from the provider's notes that were sent with the patient would cause an underestimation of its frequency of inclusion.

The efficiency score was calculated by dividing the number of nonduplicative, nonextraneous pages by the total number of pages in the scanned documents ([total pages – duplicated pages – extraneous pages]/total pages). Efficiency scores ranged from 0%–100%. Completeness and efficiency scores were then plotted against each other in a scatter plot, and a Spearman rank correlation coefficient was calculated to assess the relationship between completeness and efficiency. The significance level was set at $P < 0.05$.

Results

Over the study period, 129 patients met the inclusion criteria. Of the 129 patients, 87.6% ($n = 113$) had documents from the referring hospital scanned into the EMR. The average number of scanned pages was 20.7 (range: 1–69). The ED physician/physician extender's H&P was absent in 42.5% ($n = 48$) of the charts. The EGS diagnosis established by the referring provider was not documented in 9.7% ($n = 11$) of charts.

There was documentation that 91 CT scans were performed. Radiology reads were missing for 23.1% ($n = 21$) of the scans. Of the 70 CT scans for which radiology reads were present, final radiology reads were absent for 70.0% ($n = 49$) of the scans. Ultrasounds were performed six times, and x-rays were performed 39 times. US reads of any status (final, preliminary, and not indicated) were missing for 33.3% ($n = 2$). None of the four US reads that were present were final reads. X-ray reads were missing for 41.0% ($n = 16$) of charts. Of the 23 x-rays for which reads were present, final x-ray reads were missing for 69.6% ($n = 16$). There were 446 resulted laboratory results within the scanned records. Of these, identical results were reported at least twice in 37.9% ($n = 169$) of the written documents sent by the referring hospital, with some complete blood count, basic metabolic panel, and hepatic panel results being duplicated upward of five or more times.

The reason for transfer was missing in 18.6% ($n = 21$) of charts. Furthermore, of the 92 charts that included a reason for transfer (e.g., insurance, continuity of care, higher level of care, need for specialized service, patient complexity, patient request, or other), 37% ($n = 34$) contained at least two different reasons for transfer with three of the 34 charts containing three different reasons for transfer. Of those 34 charts, 25 (73.5%) contained at least two different reasons for transfer in two separate areas of the chart (e.g., the provider's notes indicated the reason being patient request while the transfer form indicated the reason being need for specialized services).

The position of the author documenting the information (i.e., physician, nurse, medical assistant) was not clear in 22.1% ($n = 25$) of charts. Documentation that a physician outside of the ED was consulted at the referring hospital was present in 32.7% ($n = 37$) of the charts; however, notes from consultants were absent in 89.2% ($n = 33$) of these charts. 38.1% ($n = 43$) of charts included extraneous information with an average of 5.8 extraneous pages (range: 1–47). Examples of extraneous information are provided in Table. In 68.1% ($n = 77$) of charts, information was duplicated, most often laboratory values and H&Ps. Of these charts, the average number of pages with repeated information was 8 (range: 1–30). In 12.4% ($n = 14$) of charts, documents from the referring facility had a fax date/time after the patient's ED arrival time, indicating that the information was not originally part of the written communication that accompanied the patient. Within those 14 charts, the content included laboratory results in 50% ($n = 7$) of charts and imaging studies in 43% ($n = 6$).

Completeness and efficiency scores

In regards to completeness, 45.1% ($n = 51$) of charts were missing at least one of the four required elements (H&P, provider's notes, referring diagnosis, and reason for transfer). Completeness scores were lower for transfer requests initiated during nights and weekends. The completeness score for transfer requests that were initiated over the weekend (Friday 5 PM through Monday 7 AM; mean completeness score: 3.16) was lower than the completeness score for transfer requests initiated during the week (Monday to Friday 7 AM to 5 PM; mean completeness score: 3.37; $P = 0.36$). In addition, the completeness score for transfer requests initiated at night (Monday to Thursday 5 PM to 7 AM) and on the weekend (Friday 5 PM through Monday 7 AM) was lower compared to the completeness score for transfer requests initiated during the week (Monday to Friday 7 AM to 5 PM; mean

completeness scores: 3.13 *versus* 3.37; $P = 0.27$). 19.4% ($n = 22$) of charts had an efficiency score of less than 50%, meaning that more than half of the chart consisted of extraneous or duplicated information. Higher completeness scores were not strictly associated with either higher or lower efficiency scores (Fig. 1). The 62 charts with a completeness score of 4 (a perfect score) had efficiency scores ranging from 25.7% to 100%. Only two charts out of the 113 that included referring facility documentation had a completeness score of four and an efficiency score of 100%, indicating that these charts contained all four of the required elements and no extraneous or duplicated information. The Spearman rank correlation coefficient for the completeness and efficiency scores was -0.41 ($P < 0.01$).

Examples of variation in written communication

To provide additional insight into the wide range of documentation that was present, detailed information from select example charts is provided in the following paragraphs. The completeness and efficiency scores of these three charts compared to all 113 charts are indicated in Figure 1.

Chart one was a complete and efficient chart. ED physician/ physician extender's H&P, provider's notes, referring diagnosis, and reason for transfer were all present (perfect completeness). There was no duplicated or extraneous information (perfect efficiency score [100%]), and the entire chart was nine pages. This was an example of near ideal written communication by our criteria.

Chart two was an incomplete but efficient chart. The provider's notes and reason for transfer were included; however, the H&P and referring diagnosis were not included. There was no duplicated or extraneous information, and the chart was 11 pages. This chart had a completeness score of two, but an efficiency score of 100%.

Chart three was an incomplete and inefficient chart. Although the referring diagnosis and provider's notes were included, the H&P and reason for transfer were not. There were two pages of duplicated laboratory results and 34 pages of extraneous information, which included irrelevant documents from a rehabilitation facility and patient information stickers. There were 61 total pages in this chart, over half of which were unnecessary by our criteria. This chart had a completeness score of two and an efficiency score of 41.0%.

Discussion

In this retrospective review, we critically analyzed the written communication provided by referring facilities during interhospital transfers of EGS patients. We found that information (as identified by our local expert consultants) that facilitates successful transitions of care is often missing, whereas extraneous and duplicated information is often included. The H&P, final radiographic reports, and referring diagnosis were missing in a substantial number of charts, indicating that current written interhospital communication does not provide the accepting provider with important information at the time they acquire responsibility of the patient. Furthermore, the presence of duplicated and/or extraneous information, which also occurred in a substantial number of the charts, increases the likelihood that these written communications are associated with patient care delays.⁴ When important information is

missing or “buried” by other information, written communication becomes both ineffective and inefficient.

The limited number of previous studies investigating interhospital transfers have found that the information transfer process varies greatly between institutions. One study identified the following examples: only a minority of institutions use an EMR during the process; some hospitals designate a “quarterback” physician to operate as the main point of contact during the transfer to streamline the process; and some facilities ensure that the verbal communication information is physically recorded while others do not.¹² Although there are strengths in the ways that individual institutions operate, the lack of common processes during interhospital transfers between institutions makes it difficult to improve patient outcomes.¹²

Patients transferred between hospitals have higher rates of morbidity and mortality than their counterparts admitted directly from the ED and are more likely to have significant delays to appropriate care.¹⁵ Therefore, it is crucial that the interhospital transfer process be improved. Previous studies have demonstrated that the implementation of standardized protocols increases the effectiveness, completeness, and efficiency of patient handoffs in inpatient surgical populations as well as patients being moved from extended care facilities to the ED.^{16–18} Similar protocols may be useful for interhospital transfers and have begun to be developed for critical care and neurosurgical populations. The implementation of a standardized tool during the interhospital transfer of critically ill patients has facilitated more timely patient care.¹⁹ A standardized neurosurgical referral letter for the interhospital transfer of head injured patients demonstrated this method to be a simple and straightforward manner of transmitting information that serves as a memory aide and can be quickly completed.²⁰ The use of this standardized handoff protocol has been successful both in terms of implementation and compliance, with providers being willing to both adopt and consistently use the protocol.²⁰ Getting provider “buy in” during the design and implementation of these protocols is critical to ensuring their continued use.^{2,18,20,21} The variation in the written interhospital communication we have documented provides a justification for future research efforts to develop and implement an intervention that standardizes such documentation.

Our study is subject to several limitations. First, because communication during interhospital transfers is understudied, it was necessary to create a novel abstraction and assessment protocol. As indicated laboratory and imaging studies vary significantly between patients as well as between diagnoses and because we were unable to assess whether radiology images themselves were provided, we elected to limit the completeness score to the elements recommended by our advisory panel. Although we used the guidance of the literature as well as clinicians and researchers with expertise in transitions of care for its creation, it is possible that other providers and professionals may consider different criteria important or that the importance of the criteria (i.e., weighting assigned to each element of the completeness score) that were examined was overestimated. In addition, our abstraction criteria were limited to the presence or absence of various elements of the medical record. Future studies should incorporate the quality of the information they contained, particularly for elements that are authored by providers (e.g., H&Ps or consultation notes). Second,

future studies would benefit from inferential statistics that examine our abstraction criteria in relation to markers of success, such as health care provider's satisfaction, patient outcomes, and resource utilization, to further quantify the impact of the written communication on provider's experience and patient care. Third, we performed this study under the assumption that all documents sent from the referring hospital were scanned into the EMR. However, it is possible that this was not adhered to despite being the hospital policy. If all documents were not scanned into the EMR, it is possible that the communication is more complete than what was measured. Fourth, we did not examine if providers had access to referring hospital EMRs through functions within their own EMR system (e.g., Care Everywhere). This limitation is offset by the fact that in current real-world practice, providers continue to spend time referencing the written documentation that accompanies the patient on transfer. Fifth, the study was limited to patients being transferred between EDs for one of six EGS diagnoses. For this initial study, we purposefully chose a patient population that had a limited number of EGS diagnoses and a limited stay at the referring hospital (i.e., ED visit). Future studies should include patients who have more complex EGS diagnoses (e.g., severe pancreatitis or other intra-abdominal catastrophes) and patients who are transferred between inpatient settings. These patients are likely to have lengthier and more complex hospital courses, and thus, a larger amount of documentation with a structure that differs from that of ED to ED transfers. Sixth, although we captured a variety of written communication from referring hospitals, this was a single institution study and may not be representative of other hospitals that accept transferred patients. Finally, although most referring hospitals have the ability to "push" radiology images to the UW radiology server, we were unable to assess for the presence or absence of radiology images in our study. Contracts between UW and the outside institutions allow those images to be accessed for clinical purposes only and not for research.

Written communication is a central component of communication when patients are transferred between facilities,²² particularly in the case of the acutely ill patients involved in interhospital transfers. The documentation that accompanies a patient (i.e., written communication) is the information that is most readily accessible to all members of the healthcare team. Although verbal communication is common between referring and accepting providers, the information may not be reliably or consistently shared with all individuals caring for the patient. We recognize that verbal communication is an important component of interhospital transitions of care and are pursuing an analysis of that element of communication in other ongoing studies.

Conclusions

Communication is an essential component of patient care, particularly for patients transferred between acute care facilities. The "event-driven, time-pressured, and resource-constrained" nature of the health care setting in which these communications occur adds to the level of complexity.²³ Poor communication between providers contributes to the fragmented nature of emergency care. This study has documented that information important to transitions of care is often missing in the written communication provided during these interhospital transfers and that there is often a presence of duplicated and extraneous information. By establishing the current state of written communication, this study provides

a foundation for the standardization of the communication of patient information during interhospital transfers of EGS patients.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

F.N.R.H. received support from the NIH T35DK062709 and the University of Wisconsin School of Medicine and Public Health Shapiro Program. This project was supported by the University of Wisconsin Institute for Clinical and Translational Research, which receives support from the Clinical and Translational Science Award (CTSA) program, through the NIH National Center for Advancing Translational Sciences (NCATS), grant UL1TR000427. The content is solely the responsibility of the authors and does not represent official views of the NIH.

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Fig. 1.

Completeness and efficiency scores for written communication provided during interhospital transfers of EGS patients between emergency departments. Completeness score: determined by giving one point for the presence of ED physician/physician extender's history and physical, provider's notes referring diagnosis, and reason for transfer. Efficiency score: divided the number of nonduplicative, nonextraneous pages by the total number of pages in the scanned documents ([total pages – duplicated pages – extraneous pages]/total pages).

Table

Examples of extraneous* information included in written communication provided during interhospital transfers of EGS patients between emergency departments.

Treatment consent forms	Blank pages
Orders from previous unrelated hospital visits	Deleted notes
Patient belonging inventories	Ambulance billing forms
Rehabilitation facility notes	Physician's note for employee absence

* Information not related to the referring facility encounter that prompted the transfer.