HHS Public Access

Author manuscript

Jt Comm J Qual Patient Saf. Author manuscript; available in PMC 2019 June 24.

Published in final edited form as:

Jt Comm J Qual Patient Saf. 2019 June ; 45(6): 406–413. doi:10.1016/j.jcjq.2019.02.006.

Using Incident Reports to Assess Communication Failures and Patient Outcomes

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Abstract

Introduction: Communication failures pose a significant threat to the quality of care and safety of hospitalized patients. Yet little is known about the nature of communication failures. The aims of this study were to identify and describe types of communication failures in which nurses and physicians were involved and determine how different types of communication failures might affect patient outcomes.

Methods: Incident reports filed during fiscal year 2015–2016 at a Midwestern academic health care system (N = 16,165) were electronically filtered and manually reviewed to identify reports that described communication failures involving nurses and physicians (n = 161). Failures were categorized by type using two classification systems: contextual and conceptual. Thematic analysis was used to identify patient outcomes: actual or potential harm, patient dissatisfaction, delay in care, or no harm. Frequency of failure types and outcomes were assessed using descriptive statistics. Associations between failure type and patient outcomes were evaluated using Fisher's exact test.

Results: Of the 211 identified contextual communication failures, errors of omission were the most common (27.0%). More than half of conceptual failures were transfer of information failures (58.4%), while 41.6% demonstrated a lack of shared understanding. Of the 179 identified outcomes, 38.0% were delays in care, 20.1% were physical harm, and 8.9% were dissatisfaction. There was no statistically significant association between failure type category and patient outcomes.

Conclusion: It was found that incident reports could identify specific types of communication failures and patient outcomes. This work provides a basis for future intervention development to

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Conflicts of Interest. All authors report no conflicts of interest.

prevent communication-related adverse events by tailoring interventions to specific types of failures.

Communication failures (that is, ineffective or insufficient communication)[1] between health care providers, such as physicians and nurses, pose a significant threat to the quality of care and safety of hospitalized patients. Sentinel event reviews identify communication failures as contributing to more than half of these "never events,"[2] and communication failures have been linked to significant adverse outcomes, including delays in care, surgical errors, falls, extended and inappropriate hospitalizations, serious injury, and death.[3-7]

Despite decades of research focusing on improving patient safety, adverse outcomes related to communication failures persist in part for two reasons. First, the concept of communication as adopted by health care researchers may be too narrowly defined. Current recommendations and tools to prevent failures, such as communication protocols and checklists, assume that communication is a unidimensional activity and defined as information exchange.[8] However, communication also involves the development of shared understanding, as suggested by the word's Latin root, *communicate*, meaning to share or make common. Yet this definition of communication has not been widely adopted in health care.[9] Second, limited work has been done on characterizing communication failures and describing their different types. Without information about the various types of communication failures that occur and the effect of different types of failures on patient outcomes, our efforts to learn from failures and reduce communication-related adverse events are limited.

Lingard et al.'s rhetorical framework (the study of the relationship between communication and its effects) may provide a useful basis for identifying and classifying communication failures.[1,10] Three rhetorical principles are particularly relevant to the study of communication in health care: (1) all communication has intended as well as actual effects, (2) all communication is motivated by the need to identify with an audience to "overcome differences and achieve the common ground required for a productive exchange," and (3) rhetoric places the message (content) in relation to context (audience, occasion, and purpose).[10 (pp. 508–509)] According to Lingard et al., communication failures occur not only when the content of a message is flawed, but also when the context of the communication is characterized by errors of occasion (the physical or temporal circumstances of the message are flawed), purpose (the goals, either implicit or explicit, are not reached), or audience (the right people are not involved in the communication exchange).[1]

Lingard et al. developed and validated a tool[11] based on their classification system[1] by conducting observations in the operating room. This initial classification of four communication failure types was later expanded by Halverson and colleagues in another study, also conducted in the operating room, to include errors of omission (communication was totally absent) and inappropriate communication (offensive remarks).[12] However, in both of these studies, either multiple raters were not used[12] or inter-rater reliability for identifying the same communication events as failures was low.[11] However, it is possible that observations were not able to capture sufficient context or information to reliably

identify communications failures. Communication itself is best studied as it occurs, but communication failures are often not recognized as such until after they arise.

A major purpose of hospital incident reporting systems is to identify serious adverse events for further investigation,[13] but they may serve other purposes which to date have not been explored, such as the identification and classification of communication failures. Communication failures are often identified after root cause analyses are performed following serious adverse events.[14] Communication failures have yet to be systematically examined at the instance level, such as through the methods of Lingard et al. and Halverson, within the context of inpatient care. Likewise, examination of communication failures involving both nurses and physicians have yet to be examined, which is warranted as (1) nurses and physicians are two of the most highly represented patient-facing health professionals within hospitals,[15] and (2) dialogue between nurses and physicians is requisite for working together for inpatient care.[16,17] Therefore, the aims of this study were to use staff-filed incident reports to identify and describe types of communication failures in which both nurses and physicians were involved, and explore how different types of communication failures might affect outcomes for involved patients. Characterizing the different types of communication failures and determining the association between type of failure and patient outcomes using a rich data source as provided by incident reports will not only provide a better understanding of communication-related adverse events but can also lead to targeted strategies for prevention.

METHODS

We used a descriptive mixed methods design to analyze electronically submitted, staff-filed incident reports from a large, academic health care system in the Midwest. This study was deemed appropriate for nonregulation by the institution's Institutional Review Board, as the data provided for analysis did not contain identifiable information.

Data Screening

Staff filed 28,893 reports during the 2015–2016 fiscal year. With the help of the health care system's Office of Clinical Safety, we excluded many of the categories (general event types) of incident reports unlikely to include communication as a root cause (for example, laboratory specimens, surgical instrumentation, blood products). We then retrieved the remaining categories of reports most likely to involve communication-related events: airway management, care/service coordination, diagnosis/treatment, diagnostic test, fall, ID/documentation/consent, infection control, line/tube/drain, medication/adverse drug reaction, professional conduct, and surgery/procedure. These reports were downloaded into an Excel spreadsheet with the following column headings: (1) general event type (for example, diagnosis/treatment); (2) building; (3) incident ID number; (4) entered date; (5) brief description; (6) suggest how to avoid, improve, or fix failed process; (7) actual contributing factors; (8) specific event type; and (9) current assessment of injury severity. All retrieved fields were filled out by the filing staff member except for current assessment of injury severity, which may also have been filled out or updated by the health system's safety

personnel after medical chart review. At this stage there were 16,165 reports to consider for analysis.

Next, we used electronic filtering to include reports that involved adult inpatient areas only, then searched the data set using keywords (communication, nurse/physician synonyms, mutual or shared understanding, and staff-identified categorization of communication failure) to derive an initial sample of incident reports (n = 698) for possible analysis. Two authors [E.U., M.M.] independently read through all 698 reports to understand each event as described in its entirety and determine fit for inclusion in the analysis. Incident reports were included in the analysis if they described a communication failure (that is, ineffective or insufficient communication) that involved a nurse and physician; however, they may have involved other parties as well. These two authors met weekly to discuss differences in coding, review memos, and resolve discrepancies. We achieved inter-rater reliability of 0.829 on which reports should be included, yielding 161 reports for our final analysis. Figure 1 depicts the complete filtering and coding strategy.

Analysis

Following a constant comparative method,[18] two authors [E.U., M.M.] reviewed each report, identified types of communication failures, and applied corresponding codes. We used memos and an audit trail to deliberate and achieve consensus prior to proceeding with further coding. The findings were also shared and any discrepancies discussed with all authors during regularly scheduled meetings.

First, we coded for contextual failures using Lingard and Haber's rhetorical framework as expanded by Halverson et al., consisting of errors of content, occasion, purpose, audience, omission, and inappropriate communication.[1,12] In line with Halverson et al.'s methodology, reports could be coded with more than one contextual failure type when more than one facet of the communication was ineffective or insufficient. Complex reports could also be viewed from different perspectives. In these cases, although the clinician described a communication failure as one type, we may have classified the failure differently. For example, a nurse documented in an incident report, "I was not notified that the patient was coming to the floor," suggesting error of omission. Errors of omission occurred when the necessary communication was entirely absent. However, we coded this communication failure as an error of audience, as someone had to know that the patient was coming (for example, transporters, emergency department staff, admitting department), but the nurse was not kept in the loop. When we identified reports of this nature, we reviewed all previously coded reports to ensure consistency for coding communication failures across reports. Second, we classified failures according to the definition of communication with which they most closely aligned (that is, transfer of information failure vs. lack of shared understanding failure).[19] Third, we used thematic analysis to identify four categories of patient outcomes described in the reports: actual or potential for physical harm, delay in care, dissatisfaction, and no harm. Multiple outcomes were identified for a single report when, for example, both a delay in care and patient dissatisfaction were described. Likewise, this could occur when a delay was described in conjunction with an instance of actual or potential for physical harm. When neither actual or potential for physical harm, delay in care, or dissatisfaction were

coded for a report or when it was explicitly stated that no known adverse outcome occurred, no harm was assigned as the associated patient outcome. We then explored the association between the two categories of failure types and patient outcomes, using Fisher's exact test with an alpha of 0.05.

RESULTS

Contextual Failures

We identified 211 contextual communication failures within the 161 reports. Table 1 summarizes the frequency and provides definitions and examples of each contextual communication failure type. Of the identified contextual communication failures, errors of omission were the most common (27.0%).

The second most common contextual failure (20.9%) was errors of purpose, in which the implicit or explicit goals of the communication were unclear or unresolved between the nurse and the physician. In other words, although the message of the communication was accurate and occurred among the correct participants and in the right time and place, the communicators did not have the same understanding of the goals of their communication. Such an error of purpose is illustrated in an example in Table 1: The physician’s goal of clearing a small bowel obstruction was misinterpreted by the nurse, who withheld the treatment that may have achieved the goal. Together, errors of omission and errors of purpose made up nearly half of the identified contextual communication failures.

Errors of occasion were the third most common contextual failure type (19.9%). Errors of occasion occurred when the physical or temporal situation of the communication was wrong. Errors related to the physical location of the communication could be about a tangible place (for example, an inpatient’s room or the nurses’ station) but were most often about information being communicated in the incorrect place within technology (for example, essential care information communicated within a narrative note but not in the orders). Errors related to the temporal nature of the communication were often related to late or tardy communication.

Errors of audience occurred when the appropriate individuals did not participate in communication (13.7%). In the example provided in Table 1, although the surgical team decided among themselves to cancel the surgical case, the decision was not communicated to the necessary personnel. Neither the operating room’s charge nurse, the preoperative nurse, nor the patient and his family were communicated with at the time of the decision to cancel the patient’s surgery.

The two least common contextual failures were errors of content (12.3%) and errors of inappropriate communication (6.2%). Errors of content occurred when the information in the message was inaccurate, incomplete, or unclear. Errors of inappropriate communication were often issues of professional conduct, defined as offensive remarks or unreasonable requests.

Conceptual Failures

Table 2 provides definitions, examples, and frequencies of the two conceptual failure types. More than half of the reports (58.4%) were coded as transfer of information failures. These failures occurred when the information exchange between communicators was ineffective or insufficient. The remaining reports were coded as lack of shared understanding failures (41.6%). Shared understanding occurs when communication integrates multiple perspectives and gets communicators on the same page. A lack of shared understanding occurs when the communication is ineffective or insufficient in integrating the perspectives of those involved in the communication. In the example provided in Table 2, the involved nurse and the physicians lacked shared understanding regarding whether narcotic administration during palliative treatment was appropriate for their patient.

Outcomes

The four themes identified for patient outcomes were actual or potential for physical harm, delay in care, dissatisfaction, and no harm. Table 3 displays frequencies, coding requirements, and examples for each outcome.

We identified 179 outcomes within the 161 reports. A total of 36 outcomes involved actual or potential for physical harm related to their reported communication failure. In the example provided in Table 3, the physician was not notified of the patient's declining hemodynamic status overnight, which precluded timely intervention, and the patient experienced an in-hospital cardiac arrest. The most commonly identified patient outcome in our sample was delays in care (38.0%). Delays were identified based on either an explicit statement of a delay or through time stamps that showed the time elapsed during a reported event. Of identified delays in care, 12 reports also mentioned actual or potential for physical harm to the patient.

Our exploratory analysis did not identify any statistically significant associations between contextual vs. conceptual failure type and outcomes. Consultation with the health care system's Office of Clinical Safety revealed that none of the analyzed reports were connected with an identified sentinel event.

DISCUSSION

Communication failures pose a significant threat to patient safety.[2] The objectives of this study were to identify and describe communication failures and patient outcomes detailed in staff-filed incident reports and explore the association between failure type and patient outcomes. Errors of omission were the most commonly identified contextual communication failure type. The distribution of conceptual communication failure types was almost equal; transfer of information failures occurred slightly more frequently than lack of shared understanding failures. Identified reports described delays in care more than any other patient outcome, and none of the analyzed reports were associated with a sentinel event.

We found that errors of omission and errors of purpose comprised nearly 50% of the identified contextual communication failures. This finding contradicts the implicit assumption that inaccurate and incomplete information sharing (errors of content) is to

blame for most communication-related errors in health care.[20] Rather than focusing on *what* nurses and physicians are communicating or how communication is *structured*, health care systems should focus on making sure meanings are understood among communicators. Structured handoff tools and health information technologies, such as computerized provider order entry, often convey the *what* of the communication but not the *why*. When communication is limited or reduced, goals of care cannot be clarified and failures can occur.[21] Effective communication between nurses and physicians may require dialogue and inquiry to make the purpose of clinical decisions explicit and reduce misinterpretations. Past interventions for standardizing communication have played a part in improving communication and patient outcomes, but continued work is needed to encourage dialogue and questioning between nurses and physicians, preventing errors of purpose when the goals of communication are initially unclear.

This analysis demonstrates that delays in care related to communication failures occur more frequently than previously realized. Delays in care were the most frequently identified outcome in our analysis, none of which could have been captured through external reporting mechanisms such as sentinel event reporting, which captures only the most serious or risky events.[14] The high rate of delays in care found in our analysis indicates a potential widespread shortcoming in provision of timely and appropriate care. These findings, while perhaps preliminary, are important for health system administrators and payers, as delays in care are associated with inefficiencies at the system level and can incur unnecessary costs.[22]

Despite tremendous push for incident reporting systems throughout the US health care system and worldwide, incident reporting has not had a significant effect on improving safety for hospitalized patients.[13,23] In addition, although serious and fatal outcomes related to communication failures may be captured through sentinel event reporting,[3] there is currently no reporting system or data set that captures unwanted outcomes caused by communication failures on a national scale. Communication failures described in incident reports are often dealt with on a case-by-case basis at a unit or hospital level. Root cause analysis may identify communication failure as roots of adverse events, but it is unlikely to identify what aspects of the communication failed. Our analysis demonstrates the utility of incident reports for identifying and characterizing communication failures. Moreover, this work provides important insights about the various types of communication failures and provides a basis for developing and testing approaches better tailored to address specific types of communication failures and reduce communication failure–related adverse events.

Finally, although both the original and adapted contextual communication failure classifications were developed in the operating room context,[11,12] we found it relatively easy to come to consensus when applying the communication failure classification to the incident report data. This suggests that the communication failures in different settings share similarities across classification types. For example, Arora and colleagues sought to describe how communication failures during the transfer of a patient's care from one physician to another could lead to patient harm and found that critical information was not always communicated either verbally or in writing.[24] These content omissions would be similar to errors of omission in Lingard and Haber's rhetorical framework. Consequently, this

classification-based approach and the resulting interventions could be used more broadly to address communication failures beyond the inpatient setting.

Limitations

It is important to note the limitations of this study. First, incident report data themselves contain biases. The study design limits our contribution to understanding how communication failures affect patient safety because we did not actually observe any incidents ourselves, relying exclusively on the incident reports as the source of data. Hospital staff are more likely to report serious events and refrain from reporting near misses,[13] which skews the data away from examining communication failures that did not reach the patient. Incident reports are also rarely filed by physicians,[23] which limits the ability to speak to communication failures recognized by physicians. Incident reports inherently contain reporting bias; they are filed based on a single person's perspective of an event.[13] However, because the reports were filed shortly after the events, recall bias may be minimized. Second, a small sample of reports precluded more sophisticated statistical analysis and limited our ability to determine strength of association between specific failure types and patient outcomes. However, as this analysis was exploratory in nature;, a study specifically designed to assess associations is needed before any conclusions can be drawn.

CONCLUSION

We identified several different types of communication failures using data obtained from incident reports, which may help define the scope of the problem and points to potential inadequacies in current strategies to reduce communication failures. There are many types of communication failures, and not all types—or even the most common types—are addressed through current recommendations in the health care literature. Nonspecific communication interventions alone are unlikely to significantly improve patient safety. Expanding the repertoire of methods used to study communication failures also points to the need for better tailored interventions to address specific communication failure types and perhaps more effectively prevent communication-related adverse events. It is time to shift the focus of communication failure research to a model that examines different types of failures, as this may be where the secret to improving patient safety lies.

Acknowledgments

Funding. Ms. Umberfield is a Robert Wood Johnson Foundation Future of Nursing Scholars Program predoctoral scholar. Dr. Ghaferi is supported by grants from the Agency for Healthcare Research and Quality (K08 HS023621; P30 HS024403). Dr. Krein is supported by a Department of Veterans Affairs (VA) Health Services Research and Development Service Research Career Scientist Award (RCS 11-222). Dr. Manojlovich is funded by the Agency for Healthcare Research and Quality (AHRQ) (R01HS022305; R03HS024760). The views expressed here do not necessarily reflect the views of the funders.

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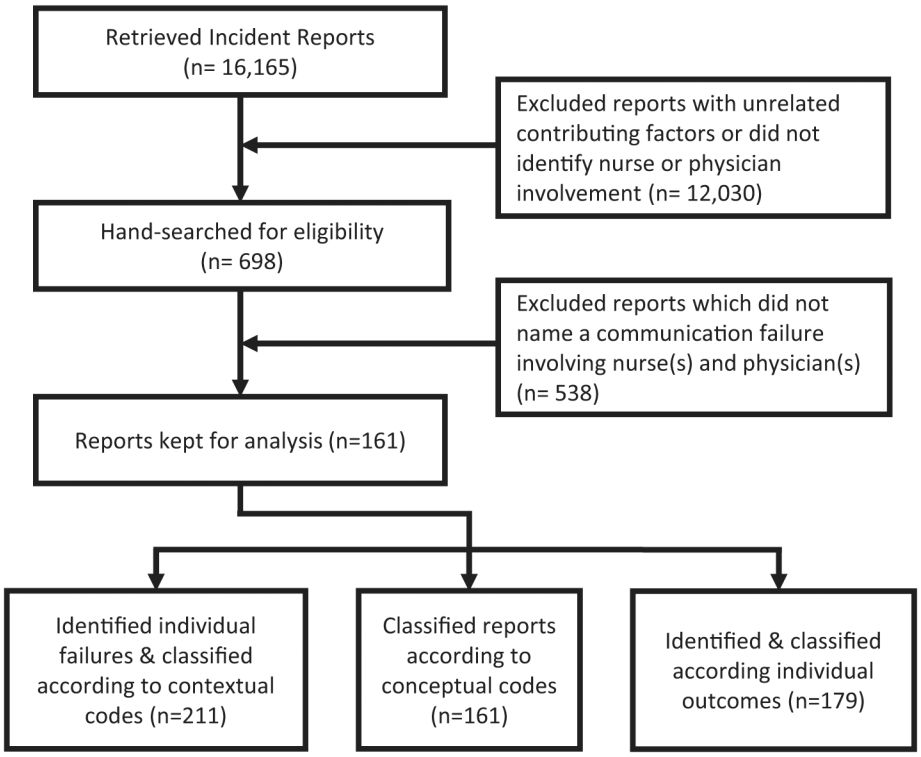

Figure 1:

This figure illustrates the process of filtering and screening retrieved incident reports for inclusion in analysis.

Table 1.

Frequency, Definitions, and Examples of Contextual Failure Types *

Contextual Failure Type	*n* (%)	Definition	Example
Omission	57 (27.0)	Necessary communication was absent.	Physician not notified of patient's [temperature of 100.4°F (38°C)] at 7pm.Tried to tell charge nurse, no answer. Paged nurse to notify physicians of abnormal vital signs, no response. [ID: 075]
Purpose	44 (20.9)	The goals (implicit or explicit) of the communication event remain unresolved.	Patient with a history of constipation was admitted … with partial [small bowel obstruction]. … A SMOG enema was ordered after the patient had already had a large bowel movement. This was intentional, in attempts to further alleviate the partial obstruction before trialing [food by mouth]. The RN taking care of the patient did not administer the enema, instead labeling it "contraindicated" without alerting the primary team or discussingc xher decision. The fact that he had not received the enema delayed progressing his diet and further care. [ID: 063]
Occasion	42 (19.9)	The physical or temporal situation or context of the message was wrong.	*Physical:* Patient had been taken to the operating room for a procedure that was potential for high blood loss, without a [type & screen]. [The surgeon] was sure he had placed an order earlier. There was no order in the chart. … I found orders prior to patient's admission that were unreleased. … [The surgeon] was correct that he placed these orders, however it appears during the pre-op clinic visit for this patient they were missed. These types of orders do not show up as active orders within the pre-op or in-patient order sets. [ID: 194] *Temporal:* The patient developed post-op atrial fibrillation (common post-cardiac surgery) while admitted to [unit A]. There was … a subsequent delay in the [unit B] provider team responding to [unit A's] request for patient evaluation. It is thought the logistics and communication played a role in the provider team delay. … [ID: 034]
Audience	29 (13.7)	Appropriate individuals were not participating.	Mr. R was put on-call for the [operating room] (OR) … and was in pre-op for 2 hours. … I called the OR charge nurse to see what the delay was … She stated she was just told that the case was cancelled. … No communication with OR, pre-op, or the patient. … Pt and family were not happy with the situation. [ID: 026]
Content	26 (12.3)	Information in the message was inaccurate, missing, or unclear.	Nurse on unit was given report from [anesthesiologist] on a patient arriving to the unit and was told that they were only on propofol and insulin. The patient arrived with vasopressin, norepinephrine, and milrinone in addition to the propofol and insulin. [ID: 217]
Inappropriate	13 (6.2)	Offensive remarks or unreasonable requests	An anesthesiologist inadvertently backed into and contaminated the corner of a sterile table.He immediately notified the scrub nurse and offered to bring him a half drape to cover it.The anesthesiologist told the scrub nurse that he might have also hit a stack of towels that was in the corner, but the scrub nurse walked over, picked up the towels, and dropped them on a sterile tray. The anesthesiologist told the scrub nurse that the towels were contaminated and now his gloves and pen were too. He shouted, "No they're not!" and threw the pen on the table and picked up and threw the towels on the floor. He shouted that he was done talking about this and that he had to "watch anesthesiology like a hawk." [Summarized; ID: 184]
Total	211		

*Definitions modified from Lingard et al.[1,10] and Halverson et al.[12] (References can be found at the end of this article.) SMOG, saline, mineral oil, glycerin; Pt, patient.

Table 2.

Frequency, Definitions, and Examples of Conceptual Failure Types

Conceptual Failure Type	*n* (%)	Definition	Example
Transfer of Information	94 *(58.4%)*	Poor or unsuccessful information exchange	Physician accidentally shut off a patient's amiodarone drip while trying to silence a beeping pump. Physician did not notify the nurse the drip was stopped.Patient became tachycardic. [Summarized, ID: 069]
Lack of Shared Understanding	67 *(41.6%)*	Failure to integrate multiple perspectives	The nurse (who wrote the report) perceived that it was medically appropriate and necessary that her actively dying patient (who had agonal breathing) should be given narcotics to ease discomfort. However, when the nurse asked a resident physician for the order, the resident stated that the patient was "sleeping" and therefore comfortable. The nurse asked another resident who also declined, stating "morphine may stop respirations." The nurse continued to disagree with this medical decision. The patient died without palliative medicine. [Summarized, ID: 025]
Total	161		

Table 3.

Frequency, Coding Requirements, and Examples for Patient Outcomes

Patient Outcomes	*n* (%)	Coding Requirements	Example
Actual or Potential for Physical Harm	36 *(20.1%)*	Explicit statement of physical harm or description of a potentially harmful physiologic change (for example, sustained, untreated hypertensive crisis)	The physician, who filed the report, states that he was not notified of tachycardia “all night,” an instance of hypotension around 5:00 A.M., nor worsening hypotension and tachycardia at 8 A.M. He received a page at 10 A.M. requesting that he come to bedside, stating that the patient was diaphoretic and not feeling well. However, no vital sign values were provided in that page. He reported immediately to the patient’s room and discovered that the patient was already being coded. [Summarized, ID: 072]
Delay in Care	68 *(38.0%)*	Explicit statement of a delay or listed time stamps to reveal time elapsed during a reported event	The patient’s assigned service requested that emergency department (ED) providers order computed tomography (CT) enterography, which requires administration of oral barium contrast. An ED provider appropriately placed the orders; however, nearly three hours later and after admission to an inpatient unit, the barium had not yet been administered. The ED nurse reported to the unit nurse that she had been told to “hold off” on administering the barium but provided no further information. The ED nurse did not return pages from the assigned service’s physician. According to the physician, “No direct harm was noted at time of this report's submission but delay in care certainly occurred as CT cannot be done until barium is completed.” [Summarized, ID: 151]
Dissatisfaction	16 *(8.9%)*	Explicit statement of dissatisfaction from the patient or patient’s family members	Mr. R was put on-call for the [operating room] (OR). … and was in pre-op for 2 hours. … I called the OR charge nurse to see what the delay was. … She stated she was just told that the case was cancelled. … No communication with OR, pre-op, or the patient. … Pt and family were not happy with the situation. [ID: 026]
No Harm	59 *(33.0%)*	Explicit statement that no harm occurred or no patient outcome was described	The patient stated, “I didn't think I was going to radiation today.” However, the nurse checked and confirmed the order and sent the patient with transport to the scheduled radiation appointment. The nurse double-checked the order by paging the physician, who stated that the patient was not supposed to go. The nurse called the radiation department and had the patient sent back to the unit prior to the treatment being initiated. [Summarized, ID: 84]
Total	179		

Pt, patient.

Jt Comm J Qual Patient Saf. Author manuscript; available in PMC 2019 June 24.