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Detection of Medical Errors in Kidney Transplantation: A Pilot Study Comparing Proactive Clinician Debriefings to a Hospital-Wide Incident Reporting System

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Abstract

Background—Rates of medical errors and adverse events remain high for kidney transplant patients, who are particularly vulnerable due to the complexity of their disease and the kidney transplant procedure. Although institutional incident reporting systems are utilized in hospitals around the country, they often fail to capture a substantial proportion of medical errors. The goal of this study was to assess the ability of a proactive, web-based clinician safety debriefing to augment the information about medical errors and adverse events obtained via traditional incident reporting systems.

Methods—Debriefings were sent to all individuals listed on operating room personnel reports for kidney transplantation surgeries between April 2010 and April 2011 and incident reports were collected for the same time period. The World Health Organization International Classification for Patient Safety was used to classify all issues reported.

Results—A total of 270 debriefings reported 334 patient safety issues (179 safety incidents, 155 contributing factors), and 57 incident reports reported 92 patient safety issues (56 safety incidents, 36 contributing factors). Compared to incident reports, more attending physicians completed the debriefings (32.0 vs. 3.5%).

Discussion—The use of a proactive, web-based debriefing to augment an incident reporting system in assessing safety risks in kidney transplantation demonstrated increased information, more perspectives of a single safety issue, and increased breadth of participants.

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Keywords

Medical error; adverse event; patient safety; kidney transplantation; data collection

Introduction

Medical errors are defined as mistakes made in the delivery of care that result in—or have the potential to result in—harm to a patient. Adverse events, defined as untoward and usually unanticipated outcomes that occur in association with health care, increase readmission rates, negatively affect the quality of life of the recipient, and adversely affect patient outcomes.¹ Kidney transplant patients are particularly vulnerable to the consequences of medical errors and adverse events due to the polymorbid nature of end stage renal disease well as the complexity of the kidney transplant procedure.² Efforts to reduce the rates of medical errors and adverse events in kidney transplant patients have been in part stimulated by high-profile events, including the removal of the wrong donor kidney, the accidental discard of a kidney from a living donor during turn-over of the operating room from the donor surgery to the recipient surgery, or disease transmission from donor to recipient.³⁻⁷ However, for every medical error that reaches the patient and causes patient harm, hundreds of near misses and thousands of medical errors occur that do not cause patient harm.^{8,9} Therefore, examining near misses and medical errors presents ample opportunity for improvement of delivery of care in an effort to reduce the rate of adverse events, which remain unacceptably high for transplant donors and recipients.^{10,11}

The Institute of Medicine report on patient safety, *To Err is Human*, which brought increased attention to the importance of medical error prevention, called for the institution of voluntary reporting programs within hospitals in order to capture medical errors and adverse events, and also provide information that leads to new knowledge and improved patient safety.^{12,13} As a result, institutional incident reporting systems have been increasingly implemented in hospitals throughout the country.¹⁴⁻¹⁸ However, incident reporting systems often fail to capture a substantial proportion of medical errors, particularly those that do not lead to adverse events. This is attributed to the fact that they are voluntary and not actively solicited, often time consuming to complete, and primarily aimed at nursing staff rather than at the entire clinical care team.¹⁹⁻²²

In an effort to augment the information collected on medical errors and adverse events via incident reporting systems, we developed and implemented a proactive web-based safety debriefing tool for clinicians and staff involved in transplant surgery. We categorized the information gathered via debriefing responses using the World Health Organization (WHO) International Classification for Patient Safety and compared it with the information obtained through the incident reporting system.²³ We hypothesized that implementation of a proactive, web-based safety debriefing would result in increased knowledge of safety vulnerabilities in kidney transplantation.

Methods

Setting

A large urban and tertiary referral transplant center between April 1, 2010 and April 1, 2011. Incident Reports were obtained from the Northwestern Event Tracking System and debriefing responses were solicited using the Web-based Northwestern Transplant Patient Safety Debriefing Tool.²⁴ Approval was obtained from the Northwestern University Institutional Review Board prior to data collection.

Incident Reports

The Northwestern Event Tracking System (NETS) is a hospital-wide electronic incident reporting system designed to capture information about medical errors and adverse events with the goal to improve patient care (Figure 1). Hospital employees are encouraged to report any events that may have negatively affected patient care, as well as any situations that occurred during hospitalization with the potential to cause patient harm. All information captured through NETS is treated confidentially.

Debriefings

An interdisciplinary team of patient safety experts and transplant clinicians created a web-based safety debriefing tool designed to obtain information from clinicians about the safety of delivery of care towards transplant patients (Figure 2).²⁴⁻²⁶ The debriefing tool solicits comments on all patient safety related concerns or events encountered during the kidney transplant procedure through several thematic prompts and four open ended questions, allowing for further elaboration when any of the initial thematic areas of care were designated as problematic.

The thematic prompts were: Communication with the Patient and the Family, Inter-Provider Communication, Distractions, Care Coordination, Patient Identification, Information Technology, Access to Necessary Clinical Data, Patient Education/Teaching, Medications, Coordination with Care Facilities/Hotel, Discharge Planning, Discharge Instructions, Appointment Scheduling, Blood/Transfusions, Labs/Studies, Equipment/Physical Environment, Patient Vitals Monitoring, Non-specific Adverse Events, Bed Availability/Staffing, Transitions/Transportation/Hand-offs.

The four open questions were: 1) Did you encounter other issues or barriers that made your work more difficult? 2) Did you follow up on issues described in this debriefing? How? 3) Did you have suggestions to address the issues described in this debriefing? 4) How would you improve patient safety?

A convenience sample of clinicians involved in kidney transplant donor and recipient surgeries was chosen for web-based debriefing. Within 24 hours of completion of selected surgeries, emails were sent to all individuals listed in the operating room nursing personnel report requesting participation via a hyperlink to the debriefing. Participants provide consent electronically and their responses are gathered anonymously and analyzed in aggregate.

Non-respondents receive reminder emails at twenty-four and forty-eight hours after the initial e-mail request.

The International Classification for Patient Safety (ICPS)

All reported issues listed in incident reports and debriefing responses were classified using the recently developed World Health Organization (WHO) International Classification for Patient Safety (ICPS). The ICPS was created via a Delphi process in order to facilitate comparison of patient safety research findings between institutions and disciplines, and has previously been applied to endocrinology and hospital medicine.^{23, 27-30} The classification includes 10 high-level concepts integrated into a framework and supported by approximately 600 concepts. This includes 4 primary types of safety incident:

A reportable circumstance is a situation in which there was significant potential for harm, but no incident occurred;

A near miss is an event that could have resulted in unwanted consequences, but did not because, either by chance or through timely intervention, the event did not reach the patient;

A no harm incident is one in which an event reached a patient but no discernible harm resulted;

An adverse event is a harmful incident that results in harm to a patient, resulting from a medical intervention and not due to the underlying condition of the patient. The classification also includes 13 primary classes of *incident type*, defined as an event or circumstance that could have resulted, or did result, in unnecessary harm to a patient; and six primary classes of *contributing factors/hazards*, defined as the circumstances, actions or influences that are thought to have played a part in the origin or development of an incident or to have increased the risk of a patient safety incident.²⁷

Two separate physician reviewers (AD, LM independently coded all incident reports and debriefing responses). Each listed issue or event described in the reports was classified as a contributing factor or patient safety incident. Reviewers further classified patient safety incidents as reportable circumstance, near miss, no-harm event or adverse event, and applied codes to each reported issue using primary classes and subdivisions from the WHO technical report.^{27, 31} Disagreements were reconciled via consensus, and any issues for which consensus could not be reached were resolved by a senior reviewer (DL).

Statistical Analysis

Frequencies were calculated for primary class and subdivision of each incident and contributing factor. Duplicate reports of safety issues and events within debriefings or incident reports were omitted from analysis. The data were summarized using descriptive statistics (frequencies and proportions). Inter-rater reliability was tested using Cohen's kappa for each primary class based on the original pair of independent determinations by the two primary reviewers (AD and LML). Data were analyzed using SAS version 9.3 (SAS Institute Inc., Cary, NC).

Results

Between April 1, 2010 and April 1, 2011, 467 surgeries related to kidney transplant were performed (190 living donor nephrectomies, 190 living donor kidney transplants, and 87 deceased donor kidney transplants). Of these, a convenience sample of 325 surgeries was selected for clinician debriefing. Characteristics of the patient cohorts are shown in Table 1. Patients referred to in both debriefing responses and incident reports are representative of the overall cohort of kidney transplant donors and recipients during the study period. A total of 270 debriefing responses were collected, reporting 334 patient safety issues: 179 patient safety incidents (range: 0-7 per debriefing), 155 contributing factors/hazards (0-5 per response), 49 mitigating factors (0-3 per response) and 5 ameliorating actions (0-5 per response). During the same study period, 57 incident reports were filed related to the care of 46 kidney transplant patients, reporting 92 patient safety issues: 56 incidents (0-1 per report) and 36 contributing factors (0-2 per report). Nursing staff and physician assistants (44/57; 77.2%), (7/57; 12.2%) completed the majority of incident reports, whereas nursing staff and attending physicians completed the majority of clinician debriefings (106/270; 40.3%) (84/270; 31.1%) (Table 2).

Web-Based Debriefing Responses

Of this 334 patient safety issues were reported via web-based debriefings, 179 were safety incidents (31 adverse events, 19 no-harm incidents, 9 near misses, 120 reportable circumstances) and 155 were contributing factors (Figure 3a). Reporting frequency remained consistent throughout the study period. Incident and Contributing Factor classes are listed in Table 3 (part a). Among debriefings, the most common *incident class* reported was Resources/Organizational Management (49/179; 27.4%), of which Human Resources/Staff Availability/Adequacy was the most common subcategory (26/49; 53.1%). The second most common incident class reported was Medical Device/Equipment (39/179; 21.8%), of which Failure/Malfunction was the most common subtype (19/39; 48.7%). The most common Contributing Factor/Hazard type reported via debriefing was Staff Factors (113/155; 72.9%), of which Communication Factors was the most common subtype (82/113; 72.6%).

Institutional Incident Reports

Of the 92 patient safety issues reported via Incident Reports, 56 were safety incidents (12 adverse events, 17 no-harm incidents, 9 near misses, 14 reportable circumstances) and 36 were contributing factors (Figure 3b). Incident and Contributing Factor classes are listed in Table 3 (part b). Among incident reports, the most common incident class reported was Medical Device/Equipment (16/56; 28.6%), of which Failure/Malfunction was the most common subtype (9/16); 56.3%). The second most common incident class reported was Patient Accidents (13/56; 23.2%), of which Falls was the most common subtype (3/13; 23.1%). The most common Contributing Factor/Hazard type reported via incident report was Staff Factors (26/36; 72.2%), of which Performance Factors was the most common subtype (15/26; 57.7%).

Most Commonly Safety Vulnerabilities

The most commonly reported safety vulnerabilities in our study were related to the surgical procedure (N=29), the availability of human resources (N=26) and medical device failure or malfunction (N=19). Examples include, “Patient had difficult and unusual anatomy including the renal artery and vein”, “Endovascular stapler malfunction; stapler worked initially when the renal artery was stapled but did not fire for the renal vein after reloading the stapler” and “fellow not available when paged to help bench the kidney in donor operation”.

Inter-rater Reliability

As shown in Table 3, good inter-rater reliability was found for both debriefing surveys and incident reports (Cohen's kappa 0.659-1.000). The lowest agreement for incident report types occurred with the Clinical Administration class due to interchange of the subclasses “transfer of care” and “handover”. Four inter-rater reliabilities could not be calculated because none of the categories were chosen on initial review by either reviewer.

Discussion

This study demonstrates that the proactive debriefing of clinicians provides detailed and timely information about patient safety risks occurring during surgical care. The clinician debriefing captured significantly more patient safety issues per patient and per response, compared to the incident reporting system, despite the fact that the debriefing exclusively solicited patient safety issues about intra-operative delivery of care, while the hospital-wide incident reporting system solicited reports about delivery of care throughout the patient's hospitalization. Interestingly, over 60% of all the filed incident reports reported on incidents in the “operating room” and “recovery room.”

The type of patient safety issue reported was quite different between the two reporting modalities. Debriefing responses provided more information pertaining to resources/organizational management and clinical processes/procedures, such as, “the operating room set up was different from the room which we usually used for laparoscopic donor nephrectomy”. Incident reports primarily reported patient accidents and documentation-related issues, such as “Improve documentation regarding anatomical variation in the donor...the information I needed to take care of the patient only existed in OTTR, not in the hospital record. The patient's med profile was not completed by transplant service or nurses on the floor” (Figure 4). In addition, debriefing responses reported significantly more contributing factors than incident reports (196/270; 72.6% vs. 37/92; 40.2%).

Our findings reinforce those of previous studies in other settings, which have demonstrated the effectiveness of clinician debriefings in collecting detailed information about medical errors and adverse events in healthcare.^{30,32-34} The type of patient safety issues reported in both debriefings and incident reports support the position that patient safety is improved by improving patient care delivery systems rather than targeting individuals and their mistakes.³⁵ The reported contributing factors reinforce the notion that a single patient safety incident often occurs subsequent to multiple contributing factors.³⁶

Another significant difference between the two reporting systems was the degree of participation. To improve patient safety, obtaining diverse perspectives increases the likelihood to identify vulnerabilities in the delivery of care. Physicians were a significant contributor, supplying over 40% of debriefing responses, contrary to contributing only 3.5% of incident reports. While similar studies have reported difficulty in enrolling physicians, including surgeons, this study demonstrates that physicians were willing participate in proactive reporting systems.^{37, 38} The fact that the web-based debriefing successfully solicited reports from nursing staff, physician extenders (e.g., physician assistants), technicians, physicians (e.g., anesthesiologists, surgeons), residents and students is suggestive that this active, web-based tool is successfully integrated into the workflow and fewer barriers for participation exist than the traditional incident reporting system.

Reporting of safety events by clinicians is critical to moving healthcare towards greater transparency. Barriers to widespread transparency include perfectionism, the culture of shame and blame, fear of retribution and lack of both formal and informal support for dealing with errors. Incident reporting systems provide significant information regarding institutional safety vulnerabilities, such as equipment failure and patient accidents. The addition of a web-based, proactive clinician debriefing provided in close proximity to the conclusion of surgery allowed for increased information about the coordination of care, such as staffing adequacy and effectiveness of clinical care tools. In contrast with previous studies that have reported decline in response rates after initial implementation of a new safety reporting tool, reporting frequency has remained consistent beyond the study period. This is likely due to the proactive nature of the tool and the continued distribution to all clinicians involved in transplant care at the conclusion of the surgical procedure. Similar to incident reporting systems, web-based debriefings can enhance the patient safety culture at an institution. The focused scope in which debriefings can be executed allows for more in-depth analysis and an ability to quickly provide staff feedback and propose remediation. In addition, use of the WHO ICPS for classification allows for comparison of issues across specialties and health systems and hospitals.

This study has several limitations that warrant further discussion. First, the data provided are from a single center and although many of our findings are supported by other studies, multi-center studies will be required to assess the generalizability. Also, the International Classification for Patient Safety is a broad classification of patient safety issues and was not specifically designed to categorize surgical care.

In summary, a proactive web-based clinician debriefing was successfully implemented to learn about patient safety issues in kidney transplantation. The data from the debriefing significantly increased the quantity and quality of information about patient safety issues. The debriefing offered, multiple perspectives of a single safety risk, and offered more information about contributing and mitigating factors, thereby providing important information for improvement. The reports suggest that improvements focusing on improving patient safety in kidney transplantation need to focus on reducing intraoperative distractions, improving clinician-clinician communication and increasing the reliability of medical devices.

The integration of the web-based debriefing into the workflow and into the electronic hospital records together with the incident reporting system may be of great value for the hospital, but specifically for specialties, such as transplantation, where patient safety is paramount, especially in the delivery of care to donors, where there is no margin for error. Finally, the goal of patient safety assessment is to translate the information collected into action.³⁹ We believe that utilization of a structured classification system will allow for faster ability to intervene, but the ultimate success of our system will be demonstrated by an improvement in patient outcomes.

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The screenshot displays the Northwestern Memorial Hospital Event Tracking System interface. At the top, the hospital logo and name are visible. Below the header, there is a navigation menu with options like 'Main Menu' and 'Logout'. The main content area is divided into several sections:

- Quick Actions:** A sidebar on the left with options like 'File Upload', 'Other Links', and 'Help'.
- General Event Information:** A section with dropdown menus for 'Classification of Person Affected', 'General Incident Type', 'Injury Incurred', and 'Equipment Involved', each with a 'Please specify' prompt.
- Person Affected:** Fields for 'Medical Record #', 'Last Name', and 'First Name'.
- Event Details:** Fields for 'Event Date' (with a date picker), 'Event Time' (with a time picker), 'Disclosure to P/Fam', 'Site', 'Building', 'Area', and 'Physical Location', each with a 'Please specify' prompt.
- Reported By:** A table with columns for 'Name', 'Role/Position', and 'Phone'. It includes an 'Add' button and a 'Delete' button.
- Witnesses:** A table with columns for 'Witness Name', 'Witness Address (No Data)', and 'Witness Phone'. It includes an 'Add' button.
- Specific Event Details:** A section with a dropdown for 'Specific Event Type' (with a 'Please specify' prompt), a text area for 'Where in process of incident occur?', and an 'Add/Remove' button.
- Brief Factual Description:** A large text area for 'Brief Factual Description (include specific event location if appropriate)' with a 'Spellcheck' button.

At the bottom of the form, there are two buttons: 'Abort Event' and 'Submit Event'.

Figure 1.
SDC 1: Northwestern Memorial Hospital Event Tracking System.

NUTORC Safety Debriefing

EVENT TYPE: PERSONNEL AND PATIENTS

EVENT DATE: AUG 31, 2012
TRANSITION DATE: AUG 31, 2012

Please answer the following questions. Your responses on the current page are not saved until you click SUBMIT.

Transition to ICU/PACU
-Click Here-

Please select which type of event occurred:
-Click Here-

Please comment on the areas listed below. For areas where issues occurred, room will be provided for a brief discussion. Please report ALL issues, problems, barriers, or annoyances you experienced or witnessed, even if they are minor or near misses. Please do not use any names (patients, clinicians, staff, etc).

For clarification, please click on (Example). Please note that your responses on the current page are not saved until you click SUBMIT. Your responses will be lost if you click the BACK button before you click SUBMIT.

Non-Specific Adverse Events (Example)	<input type="radio"/> N/A	<input type="radio"/> Issue(s) Occurred	<input type="radio"/> No Issue(s)
Bed Availability/Staffing (Example)	<input type="radio"/> N/A	<input type="radio"/> Issue(s) Occurred	<input type="radio"/> No Issue(s)
Transitions/Transportation/Hand-offs (Example)	<input type="radio"/> N/A	<input type="radio"/> Issue(s) Occurred	<input type="radio"/> No Issue(s)

Figure 2.
SDC2: Transplantation Safety Debriefing Tool.

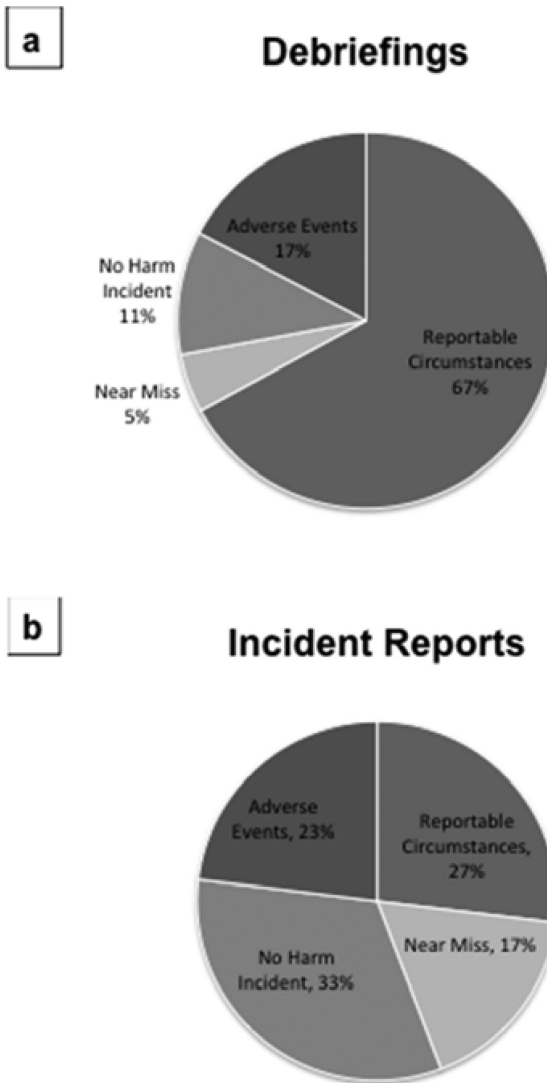


Figure 3. Patient Safety Incidents Reported. Categories of Patient Safety Incidents include: adverse events, no harm incident, near miss and reportable circumstances, Pie chart demonstrates the distribution of categories for web-based debriefing (a) and incidents reports (b).

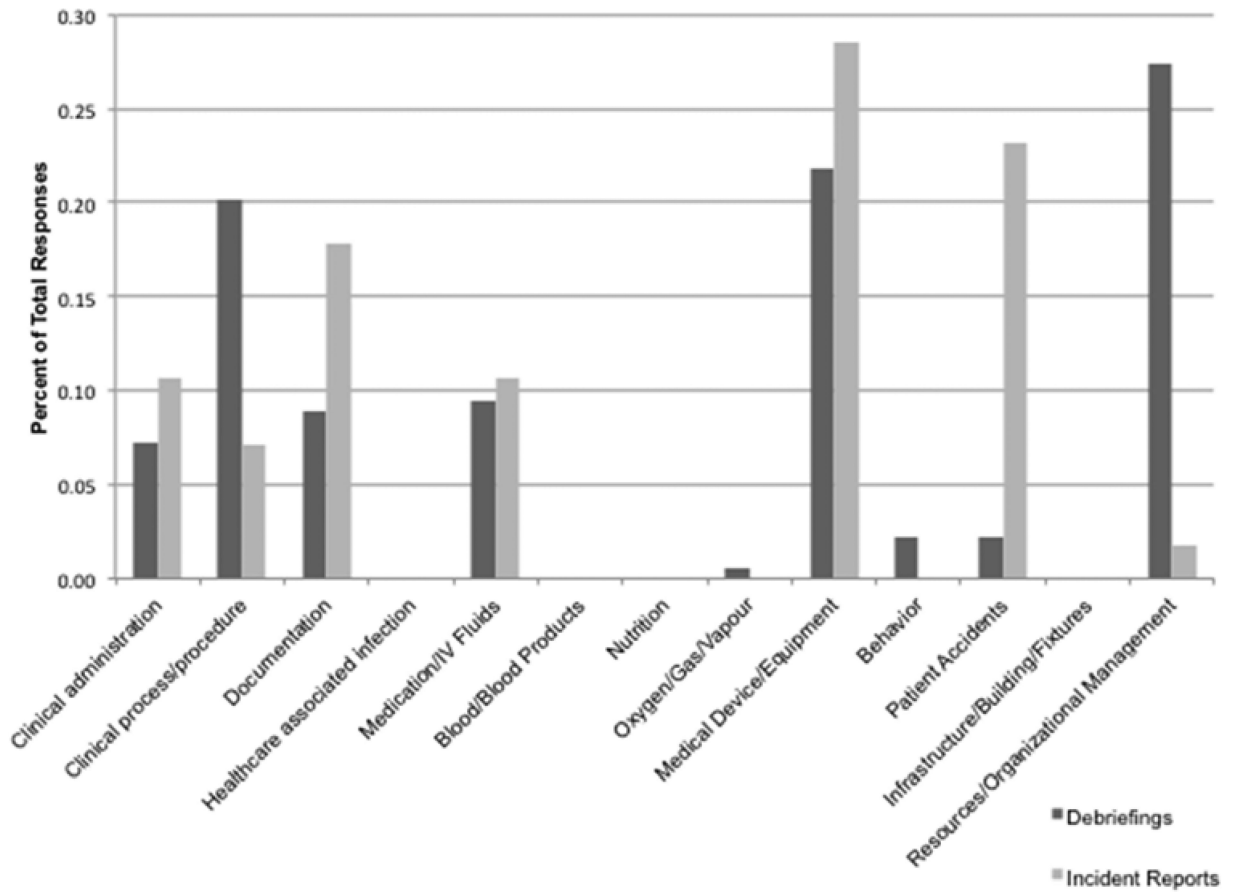


Figure 4. Safety Incident and Contributing Factor Categories Reported. The relative percent of safety incident reported in debriefings (dark line) vs. incident reports (light line).

Table 1

Patient Demographics

	Debriefing	Incident reports	All kidney transplant recipients & Donors	P value
Age -Mean ± SD	47.5 ± 13.7	49.5 ±14.3	47.1±13.7	NS
Male Gender	163 (50.2)	22 (47.8)	239 (51.2)	NS
Race/Ethnicity				
Non-Hispanic White	174 (53.5)	24 (52.2)	249 (53.3)	NS
Non-Hispanic Black	78 (24.0)	12 (26.1)	107 (22.9)	NS
Hispanic	53 (16.3)	6 (13.0)	83 (17.8)	NS
Asian	13 (4.0)	2 (4.4)	17 (3.6)	NS
Other	7 (2.2)	--	11(2.3)	NS
Language				
English	297 (91.4)	42 (91.3)	434 (92.9)	NS
Spanish	13 (4.0)	2 (4.3)	31 (6.6)	NS
Other	15 (4.6)	2 (4.3)	2 (0.4)	<0.05 ^{#^}
Insurance				
Medicare	80 (24.6)	16 (34.8)	147 (31.4)	<0.05 [#]
Private	11 (3.4)	3 (6.5)	111 (23.7)	<0.05 ^{#^}
Unknown/Other	234 (72.0)	27 (58.7)	209 (44.7)	<0.05 ^{*#^}
Primary Diagnosis				
Donor	151 (46.5)	19 (41.3)	190 (40.6)	NS
ESRD	143 (44.0)	21 (45.7)	190 (40.6)	NS
Hypertensive Chronic Kidney	28 (8.6)	6 (13.0)	83 (2.7)	<0.05 ^{#^}
Membranous Nephritis NOS	1 (0.3)	--	4 (0.8)	--
Renal Failure	1 (0.3)	--	--	--
N/A	1 (0.3)	--	--	--
Total Number	325	46	467	

SD: standard deviation, ESRD: end stage kidney disease, NOS: not otherwise specified, N/A: not applicable

* P-Value 1 compares debriefing and NETs;

P-Value 2 compares debriefing and all;

^ P-Value 3 compares NETs and all

Table 2

Debriefing versus Incident Report Respondents

Respondent	Debriefings N (%)	Incident Reports N (%)
Anesthesia Attending	22 (8.4)	2 (3.5)
Surgical Attending	62 (23.6)	
Anesthesia Fellow/Resident	11 (4.2)	0
Surgical Fellow	17 (6.5)	0
CRNA	14 (5.3)	
Circulating Nurse	45 (17.1)	44 (77.2)
Scrub Nurse	47 (17.9)	
Observer	8 (3.0)	N/A
Physician Assistant	31 (11.8)	7(12.2) *
Other	13 (4.9)	2 (3.5)
Pharmacist	N/A	1 (1.8)
Director/Manager	N/A	1 (1.8)
Total	270	57

CRNA: Certified Registered Nurse Anesthetist;

* may include nurse practitioner; Incident Reports do not differentiate between different physician specialty and between different nursing staff

Table 3

Patient Safety Issue Types from Debriefings and Incident Reports

a. Debriefings	N=334	b. Incident Reports	N=92
<i>Incident Types (Cohen's kappa)</i>	<i>N (%)</i>	<i>Incident Types (Cohen's kappa)</i>	<i>N (%)</i>
Clinical Administration (0.919)	13 (17.3)	Clinical Administration (0.659)	6 (10.7)
Admission	6	Admission	2
Consent	4	Handover	4
Handover	3		
Clinical Process/Procedure (0.818)	36 (20.1)	Clinical Process/Procedure (0.733)	4 (7.1)
Diagnosis/Assessment	4	Diagnosis/Assessment	1
	29		3
Procedure/Treatment/Intervention	1	Procedure/Treatment/Intervention	
Tests/Investigations	2		
Specimens/Results			
Documentation (0.829)	16 (8.9)	Documentation (0.847)	10 (17.9)
Charts/Medical	12	Check Lists	4
Records/Assessments/Consultations	4	Labels/Stickers/Identification Bands/Cards	4
Forms			2
		Instructions/Information/Policies/Procedures/Guidelines	
Medication/IV Fluids (0.971)	17 (9.5)	Medication/IV Fluids (0.855)	6 (10.7)
Delivery	7	Administration/Delivery	4
Preparation/Dispensing	5	Preparation/Dispensing	1
Administration	3	Prescribing	1
Prescribing	2	Supply/Ordering	1
Oxygen/Gas/Vapour (1.00)	1 (0.6)		
Delivery	1		
Medical Device/Equipment (0.974)	39 (21.8)	Medical Device/Equipment (1.00)	16 (28.6)
		Failure/Malfunction	9
Failure/Malfunction	19	User Error	3
Lack of Availability	6	Poor Presentation/Packaging	2
Poor Presentation/Packaging	5	Lack of Availability	1
Inappropriate for Task	4	Unclean/Unsterile	1
Unclean/Unsterile	3		
Dislodgement/Misconnection	1		
User Error	1		
Behavior (0.951)	4 (2.2)		
Staff Behavior	2		
Noncompliant/Uncooperative/Obstructive	2		
Risky/Reckless/Dangerous			
Patient Accidents (1.00)	4 (2.2)	Patient Accidents (0.848)	13 (23.2)
Piercing/Penetrating	2	Fall	3
Threat to Breathing	1	Piercing/Penetrating	2

a. Debriefings	N=334	b. Incident Reports	N=92
Other	1	Blunt	1
		Other	5
Resources/Organizational Management (0.931)	49 (27.4)	Resources/Organizational Management (1.00)	1(1.8)
Human Resources/Staff	26	Human Resources/Staff	1
Availability/Adequacy	10	Availability/Adequacy	
Organization of Teams/People	9		
Matching of Workload	3		
Management	1		
Protocols/Policies/Procedure/Guideline			
Availability/Adequacy			
	Total Incidents 179		Total Incidents 56
Contributing Factors		Contributing Factors	
Staff Factors (0.941)	113(72.9)	Staff Factors (n/a)	26(72.2)
Communication Factors	82	Communication Factors	9
Cognitive Factors	15	Cognitive Factors	1
Behavior	10	Performance Factors	15
Performance Factors	6		
Patient Factors (1.00)	8 (5.2)	Patient Factors (n/a)	3 (8.3)
Patho-Physiologic/Disease	8	Patho-Physiologic/Disease	2
Related Factors		Related Factors	1
		Communication Factors	
Organizational/Service Factors (n/a)	34 (21.9)	Organizational/Service Factors (n/a)	7(19.4)
Organizational	15		
Decisions/Culture	9	Protocols/Policies/Procedures/Processes	6
Organization of Teams	7		
Resources/Workload	3	Organization of Teams	1
Protocols/Policies/Procedures/Processes			
	Total Contributing Factors 155		Total Contributing Factors 36