CATEGORY 1:

Cost reduction/increase in work efficiency/patient care safety programs

ABSTRACT C1-A

IMMUNIZING THE PEDIATRIC LIVERTRANSPLANT CANDIDATE:

Laura Vinson, RN, BSN, CCM, CSSGB
Children's Hospital Colorado, Aurora, CO

Problem/situation: The Infectious Diseases Society of America (IDSA) and American Society of Transplantation (AST) currently recommend that solid organ transplant candidates should receive all age-, exposure history-, and immune status- appropriate vaccines based on the Center for Disease Control's (CDC) annual schedule. Despite these recommendations, we know that many transplant candidates are not entering transplant up-to-date for age on immunizations. In a survey study of all North American pediatric transplant hepatologists, only 8% reported that all of their patients were up-to-date for age on immunizations at the time of transplant (site study). In fact, 75% reported that the majority of their patients were not up to date on immunizations at the time of transplant. When we looked at our own center's data we struggled with getting patients up-to-date on immunizations at the time of transplant. Vaccine preventable illnesses (VPIs) are known to increase morbidity, mortality and graft loss after transplant. In a study utilizing the PHIS dataset, 1 in 5 pediatric liver transplant recipients were hospitalized for a vaccine preventable illness in the first two years following transplant. Transplant hospitalizations complicated by a VPI were significantly longer (41 days vs. 22 days), more expensive ($260,000 vs. $190,000), and had higher rejection rates (37% vs. 26%). The case fatality rate during hospitalization for RSV was 4.5% and 2.2% for influenza, significantly higher than in the general population (site study). Based on these data, we identified immunizations as a patient safety issue affecting transplant outcomes and initiated a focused quality improvement project to increase immunization rates.

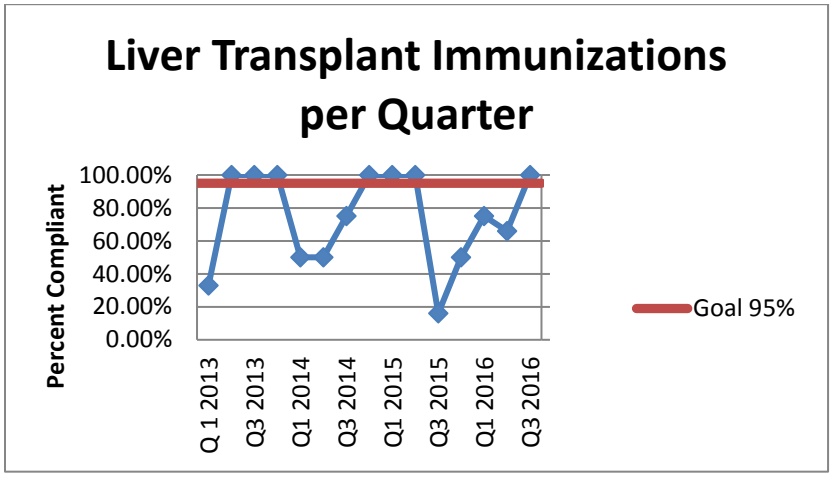
Methods/Practices/Interventions: After reviewing the gaps in our current practice we decided:

- All patients presenting for transplant evaluation will be tracked by program assistant
- Before scheduling an evaluation a request will made to get all immunization records
- Immunization records will be reviewed by Infection Disease (ID) team before evaluation
- Immunizations will be entered into medical record
- ID will formally see each patient as part of evaluation
- Immunizations will be given at transplant center when possible

In addition, patients will get as many vaccines as possible pre-evaluation. At the time of evaluation and any visit after, if there is a vaccine that is due, we will give them at the transplant center.

However, if a patient is due for a vaccine outside of an appointment for another reason, the patient can receive it at their Primary Care Physician's (PCP) office or come to the transplant center(and to liver clinic) to receive it. We left this in knowing that it isn't feasible for patients to come to our transplant center for every vaccine. ID will plan to put a "schedule" of vaccines in the after visit summary for the families. The Program Assistant is tracking the vaccines that are due and will help communicate with families.

Findings/Solutions/Conclusions: Our current data shows that once we implemented our improvements our compliance began to rise with our immunizations for patients going into transplant.



Implications/Relevance: Pediatric transplant programs need to think about immunizations prior to transplant as part of the patient care safety programs. We know that vaccines are more immunogenic before than after liver transplant. We also know that certain immunizations (live vaccines) cannot always be given post-transplant. We need to be doing everything to address these concerns before transplantation:

By having ID meet with the families and our immunizing patients in the transplant center when appropriate we are addressing:

- Parental/physician misinformation or fear about vaccinations in transplant candidates
- Improvement in knowledge of an accelerated schedule
- Misconception that vaccines are contraindicated pre-transplantation
- Fear that vaccines will prevent or negatively impact transplantation
- Difficulty in accessing vaccines
- Issues with patients not going for PCP visits
- Poor communication between families/PCPs/hepatologists
- Patients are not finishing vaccine series even though they start them because they don't know they are due
- Patients missing vaccines when they "age into" a vaccine while listed

Authors: Donna Curtis, MD, Katie Evers, RN, BSN, MBA, Amy Feldman, MD, Mary Moss, PharmD, BCPD, Kaylinda Pollan, Shikha Sundaram, MD, Laura Vinson, RN, BSN, CCM, CSSGB

ABSTRACT C1-B

PRELIMINARY RESULTS OF A DIGITIZED MEDICATION PROGRAM IN A PEDIATRIC TRANSPLANT POPULATION – PROOF OF CONCEPT

William B. Pelley, MHA, Children's Medical Center, Dallas, Texas

PURPOSE: A proof of concept pilot study was implemented to determine the efficacy of a digitized medication regimen in a pediatric transplant recipient population. The project was designed in order to determine the feasibility of digitized medications, medication adherence and the collection of limited biometric data.

METHODS: Following informed consent, eligible patients included recent kidney or liver transplant recipients between the ages of 5 and 18. Patients receiving Amiodipine or Lisinopril as a part of their post-transplant medication regimen received a co-encapsulated digital chip with their prescription. All other patients received a placebo pill with the chip embedded. All patients wore a band-aid type patch sensor over their left abdomen, which would collect the data regarding the activation of a chip when ingested. This data was transferred wirelessly to a tablet computer and then automatically uploaded to a cloud portal for review by the transplant team. Collected data included the type of pill, the time ingested, heart rate, level of activity and resting time as well as the number of steps taken in a 24 hour period.

RESULTS: 19 patients have been enrolled with an average age of 14 years. They have been on the project an average of 41 days with a medication adherence rate of 93%. The patch adherence rate is 74%. Expected patch adherence was 5-7 days but was only 3-4 days, likely due to level of activity and smaller size of some of the patients. Two patients reported skin issues under the patch. One patient was identified within 24 hours of not following a new prescription dose and was re-educated the next day and she has been compliant since the re-education. One other patient has been identified as chronic non-compliance and is being followed by our medication compliance team.

IMPLICATIONS: A digitized medication program has been determined to contribute positively to a patient safety program. It is difficult to determine patient medication adherence between clinic visits and this proof of concept project was able to identify 2 patients who were at risk. The vendor is currently working a patch re-design which should improve patch adherence and reduce the incidence of skin issues. This is critical for determining when the medications are taken. This project is ongoing and we are hopeful that other drugs will soon be added to the formulary for co-encapsulation.

William B. Pelley, MHA, Sarah Sullivan, RN, BSN, CCTC, and Dev Desai, MD, PhD

ABSTRACT C1-C

KIDNEY TRANSPLANT – EDOU COLLABORATIVE TO DECREASE 30-DAY READMISSIONS

Rebecca L. Farrell BSN, RN, CCTC. Hospital of the University of Pennsylvania, Philadelphia, PA

PROBLEM: Readmissions within 30 days of kidney transplant are a common occurrence across the United States. As most insurance payments are bundled for kidney transplant, the overall length of stay (LOS) during initial transplant admission as well as all additional readmissions reduces revenue for transplant centers. In addition to the financial concerns, there are patient safety concerns because of multiple care providers, transitions, and potential medication changes unrelated to transplant.

Reducing unplanned 30-day readmission rates is a primary goal for this large tertiary academic medical center. The 30-day readmission rates for the kidney transplant service were 29% in fiscal year (FY) 2015, one of the highest service line readmission rates within the institution. The Kidney Transplant team set a goal to decrease 30-day readmission rates by 10% for FY16 (Goal=26%); however, rates continued to increase to 46% in FY16 Q1. Further analysis revealed that 32% of the FY15 30-day readmissions had a LOS less than 48 hours and 69% were admitted via the Emergency Department (ED).

Thorough analysis of reasons for readmission identified many clinical issues that could potentially be addressed as an outpatient with observation rather than readmission. The kidney transplant team identified opportunities to collaborate with the Emergency Department Observation Unit (EDOU) to reduce readmissions.

INTERVENTIONS: The interventions will be depicted by the responsibilities of each team.

<u>Kidney Transplant Team</u>:

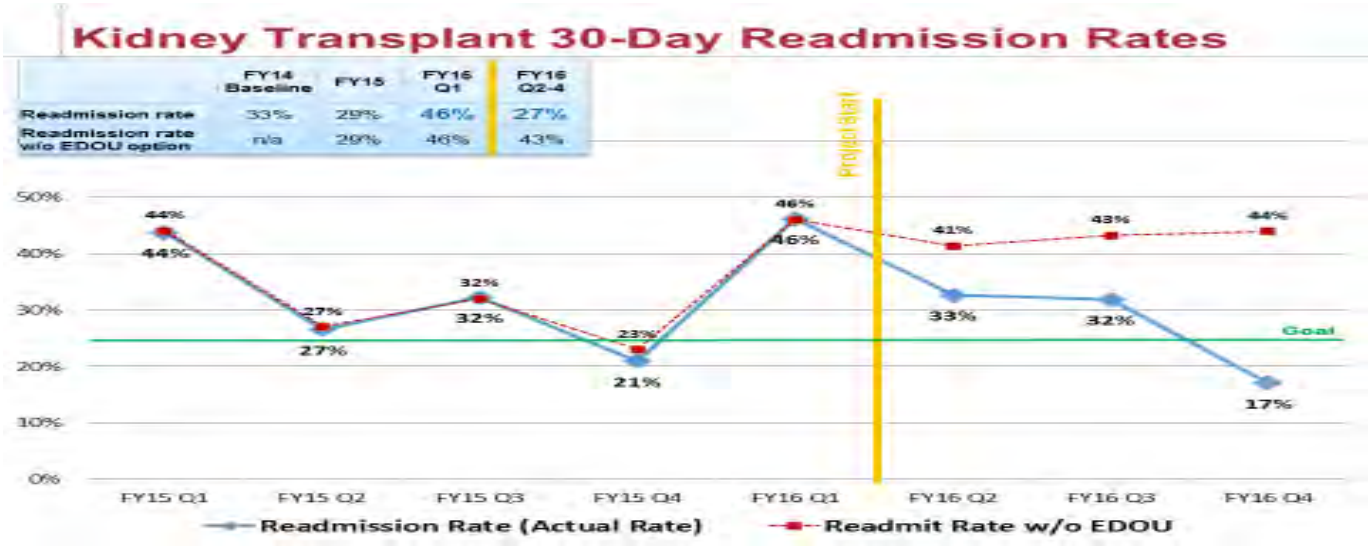
1. Criteria warranting an EDOU stay vs. inpatient admission were identified and communicated to all applicable clinical team members.
2. A plan of care is established by the outpatient transplant coordinator in conjunction with the transplant surgery providers.
3. The transplant coordinator facilitates communication amongst all team members by directly notifying the EDOU provider, ED charge nurse, and inpatient transplant team. The coordinator provides relevant clinical information and plan as discussed with transplant provider(s), as well as expected time of arrival to the ED, potential qualification for EDOU stay.
    a. All information is entered into the shared electronic medical record (EMR) with the pertinent clinical information and potential plan of care, and contact information for transplant personnel to be shared among the ED and EDOU staff.
4. If the patient is admitted to the EDOU after fast track ED triage, the inpatient transplant team adds the patient to their service list and then follows the patient.

5. Additional electronic technology was optimized in order for the ED/EDOU staff to accurately identify transplant personnel contact information.

EDOU Team:

1. The ED identifies transplant recipient during a fast track triage.
2. If patient meets observation criteria, the EDOU providers collaboratively manage the transplant patients using clinical guidelines developed by the transplant team the subset of specific clinical issues.
3. EDOU providers communicate with the transplant team through a defined phone tree.
4. Patients are discharged from the EDOU only after consultation with the transplant fellow or attending physician.

OUTCOMES: Prior to the initiation of the Kidney Transplant – EDOU Collaborative at the start of the 2nd quarter of FY16, readmission rates were at 46%. Since then, readmission rates have steadily decreased and far exceeded our stated goal of a 10% reduction. In one year we were able to reduce 30-day readmissions from 46% to 17%. The readmission rates were 33%, 32% and 17% for FY16 quarters 2, 3, and 4.



A byproduct of the reduced readmissions has been that patient safety has been enhanced with the development of a reliable destination for transplant patients with providers trained in their care. Communication among providers is also improved resulting in improved satisfaction between the patient and the multi-disciplinary team.

IMPLICATIONS: Comprehensive triage of patient complaints will allow providers to determine appropriate placement of the kidney recipient while allowing for a reduction of 30-day readmissions, efficient utilization of resources, patient satisfaction, safe transition in care, and a reduced financial burden on the patient and health system.

AUTHORS:

Susanna Nazarian, MD and Kate Ventura, MSN, RN, ACNS-BC

ABSTRACT C1-D

SHIFTING ANTIBODY-MEDIATED REJECTION TREATMENT OUT OF THE HOSPITAL

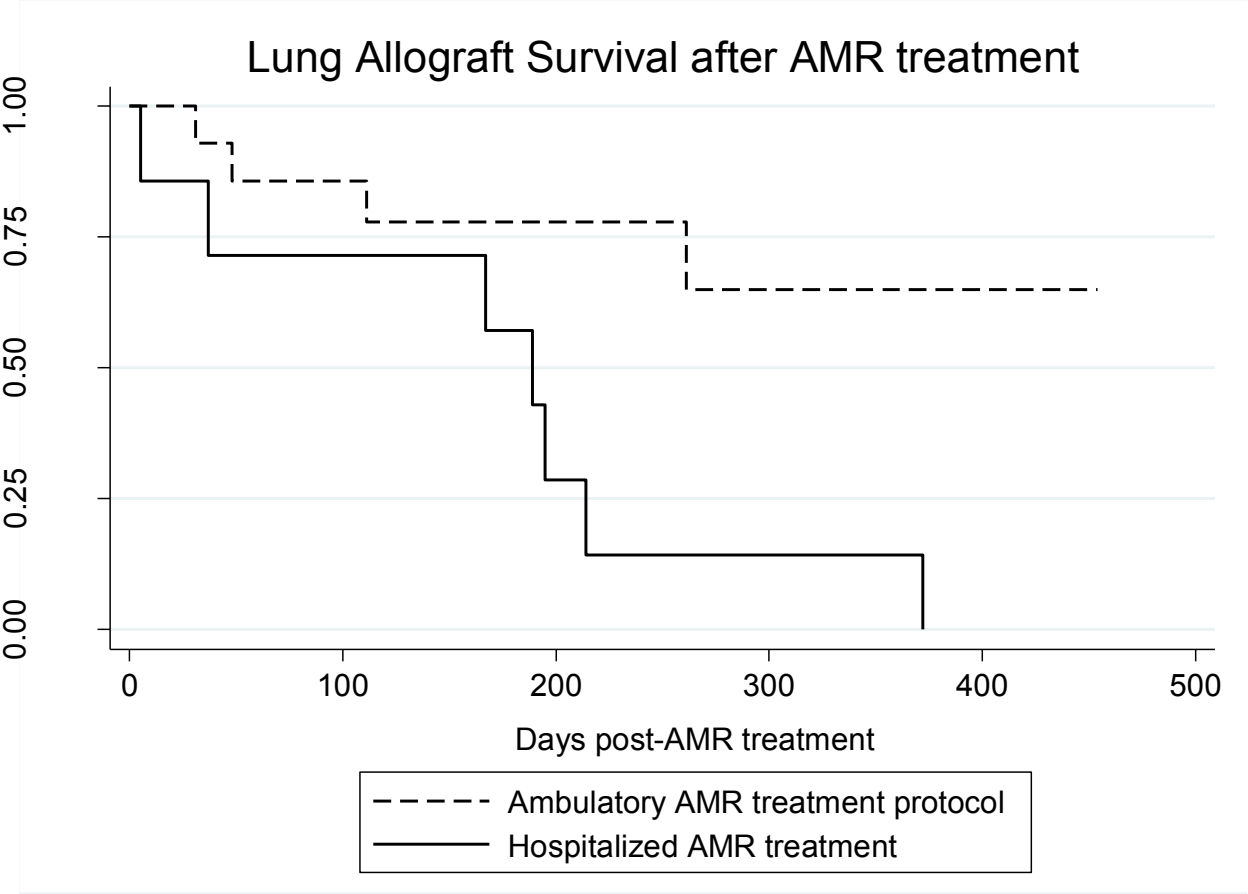
Erin Mahoney, ANP-BC, Loyola University Medical Center, Maywood, IL

Problem: Antibody-mediated rejection (AMR) is a significant cause of morbidity and mortality following lung transplantation, and treatment for AMR often calls for a high burden for the patients in terms of hospitalization and associated healthcare costs. The treatment utilizes several high cost modalities over a prolonged treatment period.

Approach: Our aim was to standardize and protocolize our treatment strategy for AMR from a hospital based reactionary schedule to an outpatient ambulatory procedure. The AMR treatment protocol was approved and adapted in a multidisciplinary fashion, involving physicians, nurses, pharmacists, information technology, social work, and financial counselors in addition to several different departments such as the intensive care unit, oncology ward, apheresis, outpatient oncology center, and nursing education to improve the delivery of care.

Findings: From January 1st 2012 to July 1st 2015 22 patients underwent treatment for AMR at our center. Seven patients were treated prior to development of a standardized protocol (Hospitalized AMR treatment group) and fifteen were treated after initiation of a standardized ambulatory treatment protocol (Ambulatory AMR treatment protocol group). The number of days from diagnosis of AMR to initiation of treatment was shorter in the Hospitalized AMR treatment group compared to the Ambulatory AMR treatment protocol group (4±3.5 versus 11±9.5), p=0.06. Although length of hospitalization was similar in both groups, intensive care unit (ICU) days were decreased in the Ambulatory AMR treatment protocol group, 8±7.8 days compared to 4.5±7, p=0.2. Graft survival was significantly worse in the Hospitalized AMR treatment group compared to the Ambulatory AMR treatment protocol group, p=0.008 (Figure 1).

Conclusion: By engaging a multidisciplinary approach to AMR treatment and developing a standardized treatment protocol which was ambulatory-based, we were able to decrease ICU days. More importantly, graft survival improved after adaptation of a standardized ambulatory treatment protocol.



Erin Mahoney ANP-BC & Erin Lowery, MD

Abstract C1-E

A SINGLE CENTER EXPERIENCE WITH THE IMPLEMENTATION OF ABO TIMEOUT REPORTING

Allison Uhll, RN BSN

Loyola University Medical Center, Heart Transplant Program
Maywood, Illinois

Problem: Our center identified inconsistencies with our ABO Verification documentation, which is an integral aspect of providing safe care for the transplant population. The heart and lung programs at our center had been using paper ABO Verification forms (figure 1) to maintain compliance with OPTN regulations regarding ABO verification prior to transplantation. Due to the number of staff involved in the transplant process, the form was being filled out incorrectly and inconsistently. The team saw high numbers of human error, illegibility and missing signatures.

Pre-transplant verification prior to organ receipt *(patient must be in the room)*
(Must be completed prior to induction of anesthesia or prior to incision in sedated patients) (complete during check-in timeout)

Patient in OR Date: _____ Time: _____	**INTENDED DONOR VERIFICATION** • UNOS *Donor* ID _____ • *Donor* ABO _____	**RECIPIENT VERIFICATION** • *recipient* ID (MRN) _____ • *recipient* ABO _____
	DONOR ORGAN VERIFICATION ☐ Heart ☐ Bilateral lung ☐ Right Lung ☐ Left Lung ☐ Whole Liver ☐ Right liver ☐ Left liver ☐ Right Kidney ☐ Left Kidney ☐ Pancreas ☐ Vessels	
	COMPATIBILITY VERIFICATION: I have verified that the donor and recipient blood types are: ☐ compatible ☐ intended incompatible (per implanting surgeon)	
Induction of anesthesia Date: _____ Time: _____	**LICENSED HEALTH CARE PROVIDER ATTESTATION:** Date_____ Time _____ ☐ We have verified that **this** organ is intended for **this** recipient. Provider name: Provider Signature Provider name: Provider Signature	

Pre-transplant Verification upon Organ Receipt *(Patient, Organ and Surgeon must be in room)*
(must be done prior to implantation)

Incision Date: _____ Time: _____	**DONOR VERIFICATION** UNOS *Donor* ID _____ *donor* ABO _____ (subtype if used for allocation)	**RECIPIENT VERIFICATION** *recipient* ID (MRN) _____ *recipient* ABO _____ (subtype if used for allocation)
Organ in Room Date: _____ Time: _____	☐ **WE** verified the organ and the ABO compatibility as marked above. **Licensed health care provider attestation:** (Check one) Date: _____ Time: _____ ☐ I completed the verification in real time ☐ (Check if done while the surgeon is scrubbed) I am also documenting the visual verification by the Implanting Surgeon Dr._____ Provider Name: Provider Signature	
Donor Cross Clamp Date: _____ Time: _____	**Implanting Surgeon Attestation** (Check one) Date: _____ Time: _____ (at time of Surgeon's signature) ☐ I completed verification in real time *or* ☐ I completed visual verification documented above Surgeon's Name: _____ Surgeon's Signature _____	

Organ off ICE: Date: _____ Time: _____
Reperfusion (unclamp): Date: _____ Time: _____

Figure 1

Intervention: In an effort to ensure patient safety, reduce errors and comply with OPTN Policy, the transplant team implemented an ABO Timeout within our program's electronic medical charting system. This Timeout module pulls recipient information (i.e. Recipient MRN, Blood Type) directly from the patient's chart and pulls donor information that was input by the Transplant Coordinator upon donor acceptance (UNOS ID, Blood Type). The Timeout includes both pre-arrival timeout (Figure 2) as well as a timeout upon organ receipt (Figure 3). This module includes discrete fields for all criteria as laid out in the previous paper form and pulls directly from the patient record when applicable (i.e. Patient In Room Time; Induction of Anesthesia Time). The module allows the OR circulating nurse to perform the ABO Verification with the surgeon

[redacted] Sarah, RN at Thu Dec 15, 2016 0255

Timeout Details
Timeout type: ABO Pre-Organ Arrival Verification (Recipient)

Procedures
Panel 1: TRANSPLANT HEART W/ HEARTMATE REMOVAL with [redacted] MD

ABO Pre-Organ Arrival Verification (Recipient)
Recipient name: [redacted]
Recipient ABO: O POSITIVE

Heart
Verified donor ABO: O
Donor ABO matches ABO in the organ record? Yes
Verified donor UNOS ID: [redacted]
Donor UNOS ID matches UNOS ID in the organ record? Yes
Donor/Recipient ABOs are compatible? Yes

Event times

Patient in room:	Thu Dec 15, 2016 0247
Anesthesia induction:	Thu Dec 15, 2016 0314
Initial incision:	Thu Dec 15, 2016 0410

Timeout Questions
Correct patient? Yes

Comments
None

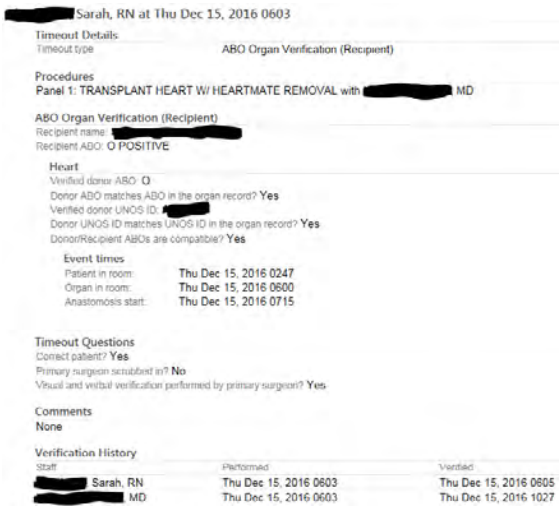
Verification History

Staff	Performed	Verified
[redacted] Sarah, RN	Thu Dec 15, 2016 0255	Thu Dec 15, 2016 0328
[redacted] MD (Res/Fel)	Thu Dec 15, 2016 0255	Thu Dec 15, 2016 0328

Figure 2

and document the time it was completed. This allows the surgeon to "sign" the ABO Verification once surgery is complete and he or she is scrubbed out by entering his or her password into the Timeout log. The module also documents the time the surgeon completes this "signature." In the case of an incorrect UNOS ID entry upon organ receipt, a hard stop is in place to alert OR staff that the UNOS ID does not match what has been entered as the intended organ for the recipient. The module also alerts the nurse to an incompatible blood type and requests comment in the rare case of an intentional incompatible match.

Findings: The thoracic transplant programs have found the introduction of the ABO Timeout Reporting module to have increased compliance to the OPTN ABO Verification Policy to 100%. Since implementation the teams have seen zero human errors such as incorrect UNOS ID documentation and an overall reduction in coordinator time to maintain compliance with these forms. Because the Timeout is documented in its entirety before the completion of the case, there has been no retroactive documentation to complete.


[redacted] Sarah, RN at Thu Dec 15, 2016 0603

Timeout Details
Timeout type: ABO Organ Verification (Recipient)

Procedures
Panel 1: TRANSPLANT HEART W/ HEARTMATE REMOVAL with [redacted] MD

ABO Organ Verification (Recipient)
Recipient name: [redacted]
Recipient ABO: O POSITIVE

Heart
Verified donor ABO: O
Donor ABO matches ABO in the organ record? Yes
Verified donor UNOS ID: [redacted]
Donor UNOS ID matches UNOS ID in the organ record? Yes
Donor/Recipient ABOs are compatible? Yes

Event times
Patient in room: Thu Dec 15, 2016 0247
Organ in room: Thu Dec 15, 2016 0600
Anastomosis start: Thu Dec 15, 2016 0715

Timeout Questions
Correct patient? Yes
Primary surgeon scrubbed in? No
Visual and verbal verification performed by primary surgeon? Yes

Comments
None

Verification History

Staff	Performed	Verified
[redacted] Sarah, RN	Thu Dec 15, 2016 0603	Thu Dec 15, 2016 0605
[redacted] MD	Thu Dec 15, 2016 0603	Thu Dec 15, 2016 1027

Figure 3

Implications: The implementation of ABO Timeout Reporting increased patient safety by providing an additional "hard stop" or warning if there is potential for patient harm. This extra safeguard ensures that the nurse is aware of an ABO mismatch or incorrect organ in the room. In these times of multitasking and breezing through timeouts, this minor step protects our patients from harm. The teams have also seen increased efficiency in their day-to-day workflow as the nurse coordinators are no longer spending time correcting human errors or chasing down signatures on paper ABO forms and can dedicate their valuable time back to patient care. Our teams also value this new process as it is so rare to find 100% compliance with such small changes in practice.

Allison Uhll, RN BSN

ABSTRACT C1-F

USING AN OPERATING EXPENSE RATIO TO COMMUNICATE CLARITY AND ENHANCE EFFICIENCY WITHIN AN ORGAN PROCUREMENT ORGANIZATION

Prakash Rao PhD, MBA, FACHE, HCLD, NJ Sharing Network, New Providence, NJ

Situation: In order to build and maintain a healthy organization, the organization must have an effective leadership team that creates, reinforces, and over-communicates clarity. The Operating Expense Ratio (OER) is a tool that measures management efficiency and may be used to communicate clarity throughout the organization. We use the OER to convey the laboratory's productivity and impact to the organization's bottom line.

Methods: The OER is calculated by taking the total laboratory expenses and dividing it by laboratory-generated revenue. The laboratory OER is updated monthly, displayed as year-to-date (YTD), and visible by all employees via the organizational dashboard on the intranet. Ideally, our desired OER is below 0.75.

OER Values

- ≤ 0.60 = Really lean and efficient
- 0.65 – 0.75 = Very good efficiency
- ≥ 0.80 = Middle of the road to poor efficiency

Findings:

As of November 30, 2016, our YTD laboratory OER was 0.71. This means that for every dollar the laboratory made, the laboratory spent 71 cents. The difference (29 cents/dollar) is used to help support organizational operations.

When viewed on the intranet, employees (from both within and outside the laboratory) are made aware of the laboratory's financial contributions to the company as a whole.

Relevance:

For employees of the laboratory, the OER can be used to monitor department expenses. For employees outside the laboratory, the OER is a clear indicator of how laboratory operations support the broader organ procurement operations. Using the OER as a communication of clarity enhances employees' trust in the organization which aids in the building and maintaining of a healthy organization.

Misty Marchioni, Donna King, Ijeoma Okere, Julien V. Napoleon, David O'Hara, Prakash Rao

ABSTRACT C1-G

TRANSFORMING COMMUNICATION IN HEALTHCARE WITH A TRANSPLANT PROTOCOL APP

Demetra Tsapepas, New York-Presbyterian Hospital/Columbia University Medical Center, NY

For abstract, please contact Demetra Tsapepas.

ABSTRACT C1-H

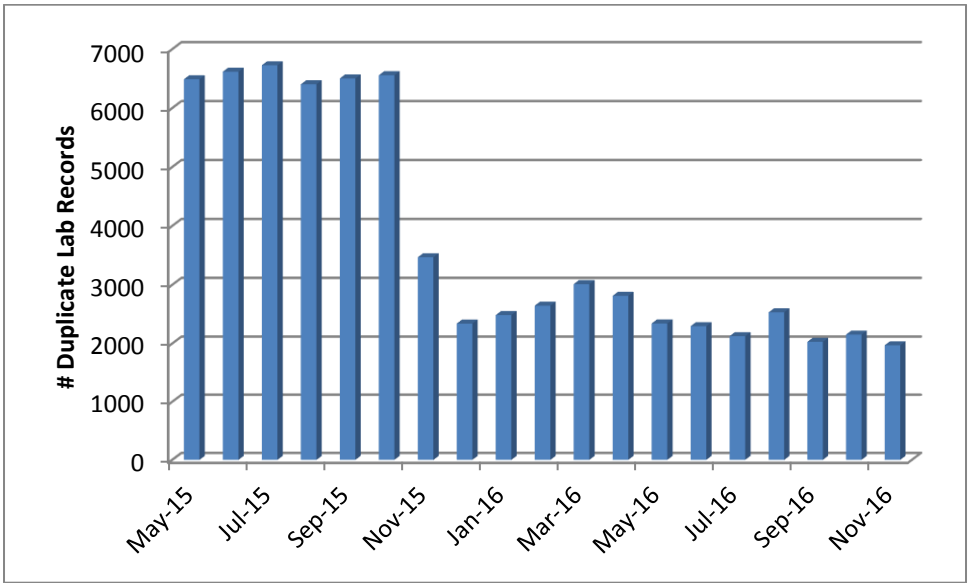
TRANSPLANT: IMPROVING PATIENT SAFETY BY REDUCING DUPLICATE LAB MEDICAL RECORDS

Peggy Bradshaw, BSN, RN, Sentara Norfolk General Hospital, Norfolk, VA

Problem: Missed lab results place transplant patients at increased risk for rejection, graft loss and even death. In April 2015, the Renal Transplant Program reported a safety event involving a missed lab test result. Later that month, two additional events involving Transplant/Advanced Heart Failure patients occurred. The oversight was related to the lab result being entered into a newly-created duplicate medical record. The transplant staff linked the error to creation of duplicate records for external labs sent to the health care system, particularly involving home care.

Method: The Transplant/Advanced Heart Failure Program gathered a cross-departmental team tasking them with eliminating duplicate lab medical records. This Performance Improvement Team included representatives from transplant, safety, lab, home care and information technology leadership. The team reviewed current workflows detailing lab test ordering, collection and processing. The team identified middle initial variances between home care and existing electronic medical records. Strategies developed for patient safety improvement included standardizing home care electronic medical record documentation and implementation of an "alias" in the electronic medical record lab system for patients with middle initial variances, as an exception to other "like" demographics.

Findings: The health care system experienced a system-wide reduction in duplicate records for external labs. In May 2015, system-wide lab duplicate records were 6,490. Initial one-year results demonstrated duplicate records reduction to 2,345, which is a 64% reduction from baseline. Eighteen months later, a 70% reduction to 1,970 has been sustained.



Relevance: Although the Transplant/Advanced Heart Failure Program initiated scrutiny of duplicate medical records as the result of a focused review of patient safety events, the end result is a 70% error reduction throughout the health care system. This represents a reduction from 68 to 38 hours a month spent in merging duplicated medical records. In terms of cost reduction, approximately $650 per month is now being spent for error correction as compared to $4,000 a month in May 2015. When members of the team collaborate across lines of care, processes and outcomes are improved.

Peggy Bradshaw, BSN, RN

Margaret Sullivan, BSc, MBA, RN, Vicki Pierce, MT, ASCP, Melanie Englen, BSN, RN, Patricia Bourassa, BSN, RN, CPHQ, Laura Sims BSN, RN, CCTC.

ABSTRACT C1-I

CAPTURING SAFETY EVENTS IN A LARGE ACADEMIC MEDICAL CENTER

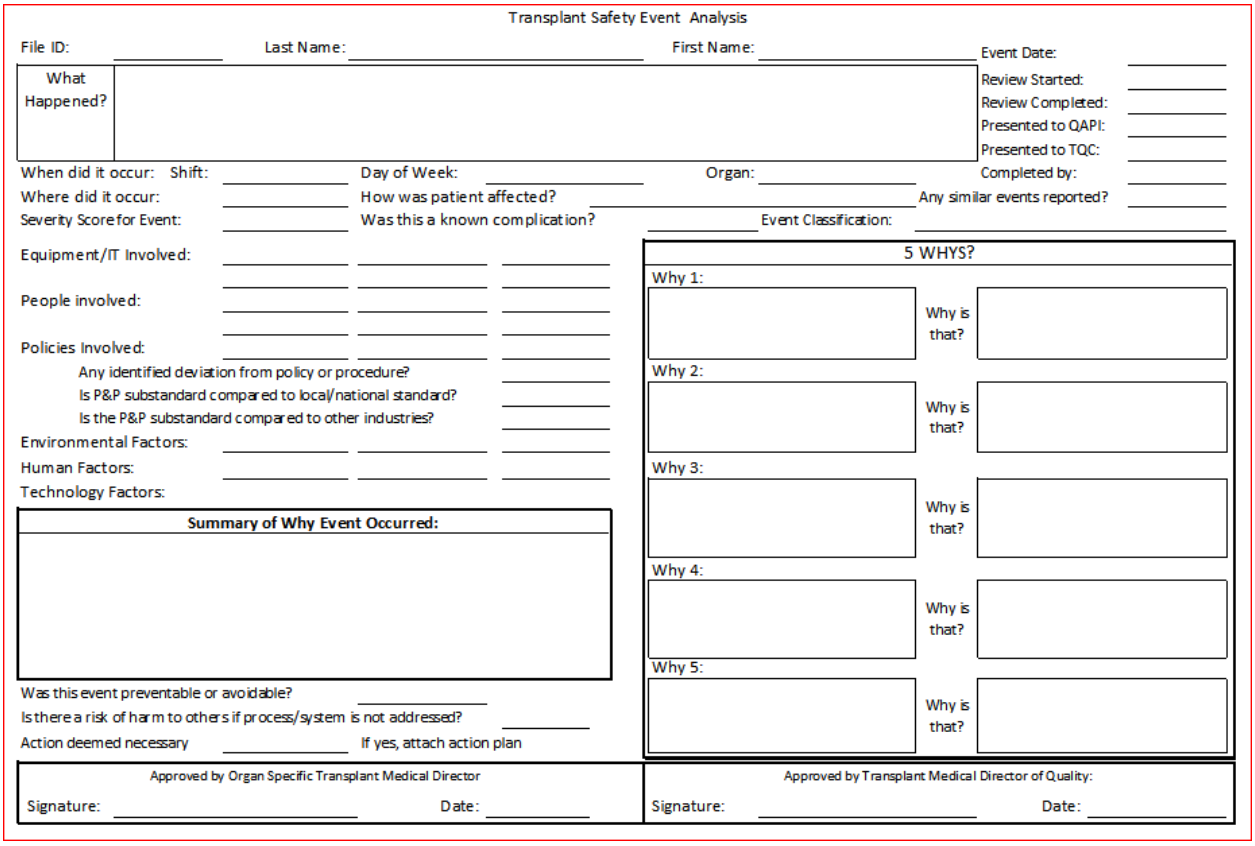
Lisa M. Stark, MSN, RN

Problem / Situation:

New regulations requiring transplant programs to monitor, track, and trend all patient events were released by the Centers for Medicaid and Medicare Services (CMS) in 2014. These regulations cover patients throughout all phases of transplant. There is not a trigger within our computer system to identify a patient as a transplant patient during all phases of care. Additionally, our patients are cared for in many different departments and locations throughout the institution. The lack of a trigger and the wide range of patient care areas made it difficult to track the transplant patient events. To comply with the new regulations, a process needed to be created to identify safety events entered on transplant patients. A mechanism to evaluate the severity of the event and recognize trends across our transplant programs was also implemented.

Methods / Practices / Interventions:

- Met with the information systems support person responsible for both the electronic medical record (EMR) and the safety event reporting system to explore ways to identify the transplant patient population. We were unsuccessful with easily identifying transplant patients within either system.
- The Transplant Quality Specialist created a master spreadsheet of all patients currently on the waitlist or transplanted and being followed at our facility.
- The hospital safety event specialist created a report that is sent to the Transplant Quality Specialist on a daily basis to include all safety events entered within the hospital system in the past 24 hours.
- This report is copied into the spreadsheet and a v-lookup is completed to identify which events are associated with transplant patients based on medical record numbers.
- Once events were identified they were entered into the Transplant Safety Event Log to assist with trending.
- Each event entered into the log is then investigated by the nursing or operations leader assigned to the area where the event occurred.
- This information is entered into the hospital's safety event system as well as entered onto a Transplant Safety Event Analysis Tool which is an active PDF that consists of drop downs and limited free text fields.



Transplant Safety Event Analysis

File ID: Last Name: First Name: Event Date:

What Happened? Review Started: Review Completed: Presented to QAPI: Presented to TQC:

When did it occur: Shift: Day of Week: Organ: Completed by:

Where did it occur: How was patient affected? Any similar events reported?

Severity Score for Event: Was this a known complication? Event Classification:

Equipment/IT Involved:

People involved:

Policies Involved:

Any identified deviation from policy or procedure?

Is P&P substandard compared to local/national standard?

Is the P&P substandard compared to other industries?

Environmental Factors:

Human Factors:

Technology Factors:

Summary of Why Event Occurred:

Was this event preventable or avoidable?

Is there a risk of harm to others if process/system is not addressed?

Action deemed necessary If yes, attach action plan

5 WHYS?

Why 1: Why is that?

Why 2: Why is that?

Why 3: Why is that?

Why 4: Why is that?

Why 5: Why is that?

Approved by Organ Specific Transplant Medical Director

Signature: Date:

Approved by Transplant Medical Director of Quality:

Signature: Date:

Findings/ Solutions/ Conclusions:

- After all information has been gathered, the event is reported out at the Transplant Safety Meeting which consists of quality, compliance, medical and nursing leadership.
- A summary of the event and outcome is presented at the organ specific quality meeting.
    - Action plans which are organ specific are monitored by the organ specific quality meeting.
- On a quarterly basis a high level analysis is reported to the Transplant Quality Committee which consists of hospital and transplant leaders.
    - Since implementation in September 2015, we have presented 2 cohorts of data to the Transplant Quality Committee. The first cohort being between September and January 2016 resulting in 209 safety events affecting 92 patients (36 heart, 25 liver, 20 kidney, and 11 lung) with events most likely to occur on dayshift on either a Monday or Friday. The second cohort of data was between February and 2016 and June 2016 which resulted in 251 safety events affecting 96 patients (26 heart, 25 liver, 30 kidney, and 15 lung) with events most likely to occur on dayshift on either Wednesday or Thursday.
- This process has resulted in Transplant Services being able to identify events entered on their patient population regardless of location.
- Due to the increased analysis completed on these events, there have been multiple system solutions implemented to better prevent harm to all patients throughout the entire health system.

Implications/ Relevance:

Utilizing the new process, we are in alignment with CMS regulations to complete a thorough analysis on all transplant patient events. As a result of better tracking/trending of patient safety events, we have implemented new processes to prevent the recurrence of similar safety events.

ABSTRACT C1-J

HUDDLES EMPOWER TEAMS TO BETTER MANAGE DAILY OPERATIONS

Amy Smyth, MA, CPHQ, UW Health University of Wisconsin Transplant Program, Madison, WI

Purpose: In 2015, the Transplant Service Line recognized a need to standardize daily management practices to better monitor operations, anticipate problems and rapidly respond to the needs of our patients, staff, and faculty, within the service line and between the various departments and stakeholders who influence daily operations. To fill these operational gaps, the service line implemented a tiered huddle structure to share information with frontline staff, review events, and coordinate daily activities (Goldenhar et al, 2013). As a result, the service line's culture and approach to daily operations has shifted from reactive to proactive.

Method: Transplant administration partnered with hospital's quality department to plan and implement the tiered huddle structure. The partnership was spearheaded in an effort to test and promote daily operational management practices, with the goal of sharing the results of Transplant's experience with other service lines and departments throughout the organization. A daily transplant leadership huddle was piloted, which included the service line directors and leadership from the organ procurement organization, transplant inpatient units, the transplant outpatient clinic, the transplant coordinators, transplant data office, and others. Within weeks of the leadership huddle pilot, others areas in the service line, including the transplant inpatient unit, the transplant clinic, and the various coordinator organ areas, began the second tier huddles. Each huddle is takes approximately 5-15 minutes. Agendas vary, as well as the visual management boards that support the huddles, but all include patient volume, staffing and resources, safety concerns, high risk scenarios, and updates. According to Provost et al (2015), "huddles create space for a diverse group of care providers to assess events both routine and unexpected and lead to new shared understanding," therefore, all huddle participants are encouraged to bring up issues or concerns.

Results: A survey was sent prior to the implementation of each area's huddle and again post implementation. Transplant leadership rated themselves as highly effective or effective in proactive patient safety and service 20% of the time prior to huddles and 71% of the time after huddle implementation. It also found that prior to huddles, 38% of transplant leadership agreed or strongly agreed that they knew where to find service line information, but this increased to 57% post huddle implementation.

Conclusion: Huddles in all areas of the service line have now been implemented and survey results in each area continue to be positive. Furthermore, huddles are now occurring across a variety of areas within the larger organization and the Transplant Service Line continues to be a model for excellence.

Jaime Meyers, RN, MS, CCTC

ABSTRACT C1-K

INTEGRATING LEAN SIX SIGMA AND INDUSTRIAL ENGINEERING TO OPTIMIZE THE KIDNEY TRANSPLANT PRE-CLINIC PATIENT FLOW

Richard Cartwright, ISYE UI Health Department of Transplantation Chicago, IL

Purpose

Transplant utilizes a multidisciplinary team approach to offer patients a best-practice pre-transplant evaluation. Involved in accomplishing a complete evaluation is assessment by a minimum of six providers which, with lack of an efficient process, led to high patient wait times, frustration by both patient and staff, and long appointment times. Incomplete and unfinished multi-disciplinary appointments were the result in many cases. The National Academy of Sciences and Institute suggests the use of industrial engineering and lean six sigma techniques to improve both efficiency and effectiveness of healthcare. These techniques were utilized in the Pre-Transplant Clinic to optimize the Multi-Disciplinary Kidney Pre-Transplant Evaluation Clinic flow, maximizing patient/provider time, while minimizing patients' and providers' time within the clinic.

Methods

The project team followed the DMAIC structure of problem solving. Define utilized VOC, Gap Analysis, and SIPOC to develop the project charter. CTQ's were identified and the scope was determined.

Time studies to determine provider times were conducted and data was collected to track patient flow. Flow charts, a forecast for transplant demand and trend analysis were developed.

Data was analyzed to determine patient time in system, total provider time, individual provider times, and the probability of objective failures. Clinic patient load and production rates were calculated. A line balancing algorithm was selected and the operations were balanced.

A launch sequence of providers was developed and visual aids were created. A discreet event simulation was developed and used to validate improvements to clinic operations. Training was provided for all transplant team members.

Results

Data analyzed after three months of operation yielded an increase of probability to the objective of seeing all six providers to .87, from the benchmark of .67. The probability of a patient seeing all providers scheduled increased to .998 from .83. The probability of failure decreased from .68 to .28. Provider time in system averaged 3.2 hours for six providers on a new evaluation, with an efficiency ratio of 94%.

Conclusion

The Pre Evaluation clinic is showing much improvement, with clinic operations typically ending on time. Feedback regarding concept of sequenced stations and the use of visual aids were favorable. Frustration is reported at a much lower level. An education session was created

and incorporated into clinic operations, creating uniformity in patient education and a buffering agent against late patients. There is work to be done in the "clinic catch-up week," which is being analyzed at the point of this writing.

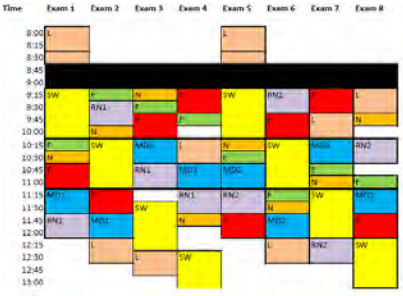
The multi-disciplinary team has become accustomed to the operation and a roll-out to other transplant clinics is currently underway. Goals of minimizing patient time in system while maximizing patient-provider time and minimizing overall provider time in clinic have been met.

Simulation Model 1

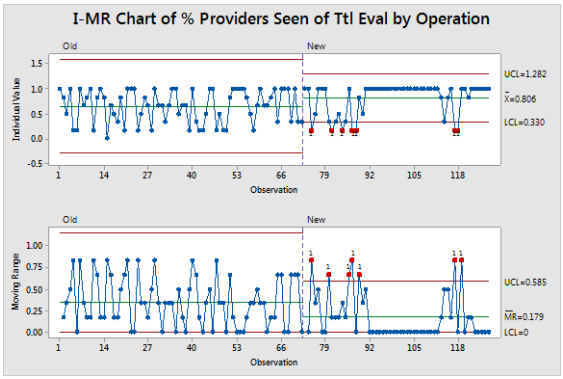
Line Balance

Balance Time	42.34				
			Largest Candidate		
Provider	Time (Min)		Station #	Ttl Time	
Social Worker	60		1	60	
Nephrologist	30				
RN Coordinator	30		2	60	
Education	30				
Pharmacist	20				
Nutritionist	15				
Financial Spec	10		3	45	
Phlebotomist	10				
CSR Check In	5				
MA Discharge	5				
MA Triage	5		Balance Efficiency		0.916667
			Balance Efficiency with Lab		0.972222

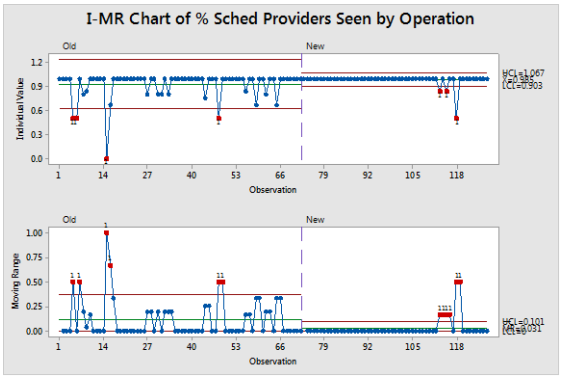
Launch Sequence for Providers



Clinic results of Goal



Results of Scheduling Effectiveness



Richard Cartwright, ISYE
Patricia Kemerley, MSN *Process Owner*
Jose Oberholzer, MD *Process Champion*

Kristen Coombe RN, MSN,MBA
Jane Wong RN CHPQ
Antoinette Ellen, CMA

ABSTRACT C1-L

KIDNEY PAIRED DONATION-BUSINESS PROCESS

Crystal Sprang, MBA, University of Michigan, Ann Arbor, MI

Situation: Paired Donation has been an exciting development in the world of kidney transplantation. The business process of tracking paired donations from evaluation through donation has been complicated by many factors, especially when the donors and recipients are from different transplant centers.

All pertinent Donor and Recipient information needs to be gathered to create a contract between the two transplant centers. The current process gathers the information, completes the contract for each party to review, provides final review of the contract for signatures, and then moves forward with operating room scheduling.

We recently discovered that when changes arise, there is no specific process for communicating those changes between donors and recipients. For example, a donor or recipient at an outside facility may fall ill prior to the donation and the scheduled surgery is cancelled. In these instances, the patients are frequently re-paired with different matches altogether and the process of gathering the needed information to get a new contract in place is repeated. By instituting additional communication processes, we can ensure more accurate and timely communication between all parties (internal and external) and delayed donor/recipient evaluations can be avoided.

In addition, there currently is no clear CMS reimbursement guidance for paired donation. Transplant programs are unclear as to who is responsible for payment and reimbursement. This has led to missed initial billing opportunities requiring additional work by our finance team.

After discovering the internal communication issues, we began to review our team's process of entering data into our transplant information system. We found that often the original donor and recipient matched were never changed to reflect the cancellation of a contract or surgery.

We also identified a lack of standardization in the information entered into the transplant information system, including the specific link between donors and recipients and icons used to track the process.

Approach: Our Transplant team decided to apply LEAN tools by developing a process flow chart to determine what procedures were already in place. We discovered that there were many disparities between the donor office, financial coordinators and the contracting office.

The following approaches will be utilized to ensure the continued success of our paired donation program:

- Creation of an insurance billing code to streamline the billing process and make contracts with kidney exchange programs simpler.
- Institution of a consistent and systematic documenting process for the donor team to use in the transplant information system and patients' electronic medical records.
- Construction and utilization of an internal Paired Donation Reference Guide.
- Addition of all internal parties (finance team, contract office) to internal master list of Kidney Paired Donors and additional email groups to ensure communication.
- Creation and continual update of a flow sheet of the Paired Donor process.

Results: We will incorporate a monthly review of paired donation logs to ensure data integrity and consistency and to affirm that all parties are communicating pertinent information. Finance office team will utilize UNET to ensure accurate documentation for compliance purposes. Ongoing training will be provided to staff members to confirm appropriate knowledge base for documentation and compliance. Once the flow chart is complete, all parties will have a reference guide to assist with determining what type of contract is needed and who serves as the guarantor.

Conclusion: By opening our internal lines of communication, our Paired Donation program will be able to restructure the current program to ensure quality care and service for all internal and external parties. We will be better suited to serve our customers (donors, recipients, outside facilities) by providing a standard for successful paired donor programs. We will continue to pursue a smooth flow of communication from the customer's initial phone call through post-transplant/post-donation care.

Crystal Sprang, MBA,

Erica Monahan, B.B.A.

Paul Rzepecki, M.B.A.

ABSTRACT C1-M

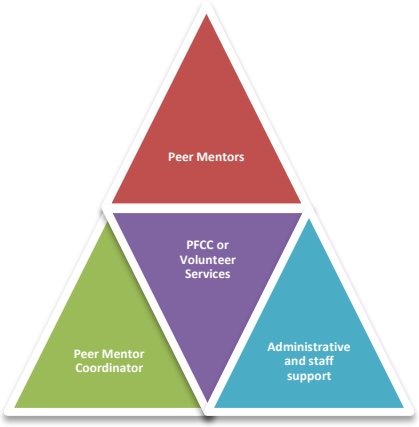
DEVELOPING AND MAINTAINING A PEER MENTOR PROGRAM

Stacy Brand, MBA, University of Michigan Transplant Center, Ann Arbor, MI

Problem: Navigating the healthcare system can be challenging for many people, especially those that have a chronic illness. It can be overwhelming to learn about your disease and then have to go through various procedures and tests while still taking in new knowledge. Patients may have an excellent support system of family and friends as well as a strong healthcare team but often feel that they need more. Having the ability to speak with someone that has been in their shoes can be an added benefit to their care. Our center recognized this and has created and sustained a kidney transplant peer mentor program that benefits our patients, family and even staff.

Methods: Developing a Peer Mentor Program:

- Buy-in and support of program from team and management
- Patient and Family Centered Care partnership
- Utilization of peer mentors (Dialysis centers, inpatient, outpatient, phone/email, committees)
- Partner with other organizations that can provide support
- Assign peer mentor coordinator/time commitment needed
- Work with others who have had success
- Trainings and materials for peer mentors
- Track peer mentor hours through online calendar system



Results: The peer mentor program was created with the intent to help patients through the transplant process from referral until after transplant. Since the inception of the peer mentor program, our kidney transplant peer mentors have met with patients at dialysis centers, transplant clinics and in the hospital. In 2015 (the 3rd year of the kidney transplant peer mentor program), the program:

- Included 31 kidney recipient peer mentors and 4 kidney donor peer mentors
- Contributed more than 600 hours of peer mentor activity
- Traveled to 16 dialysis centers across the state
- Created a peer mentor newsletter
- Joined forces with the Health System to create a hospital-wide peer mentor training program

Implications: The peer mentor program has helped get patients listed faster, humanized the impact on patients, family, physicians and staff, and broken down barriers to learning about transplant and getting access to care. This program has resulted in greater satisfaction for our patients and made a difference in the lives of our peer mentors.

Stacy Brand, MBA, University of Michigan Transplant Center, Ann Arbor, MI
(Presented on Peer Mentor Program at 2016 IPFCC Conference in New York)

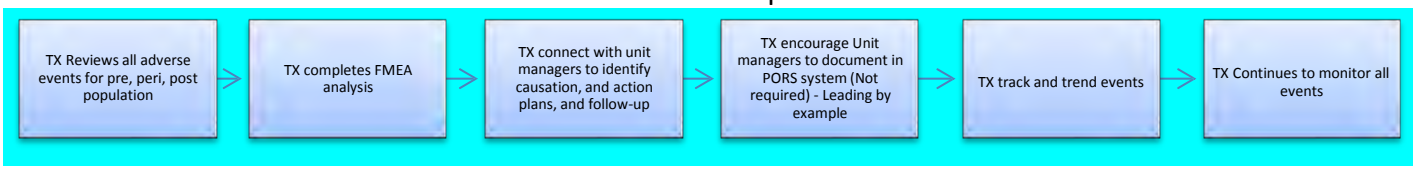
ABSTRACT C1-N

THE TRANSPLANT SAFETY HUDDLE- AN ENHANCED METHODOLGY IN ADVERSE EVENT MANAGEMENT

Deborah D. Erickson, BN, MS, PhD, RN, UNC Center for Transplant Care, Chapel Hill, NC

Problem/Situation

Transplant industry regulations require centers to identify, report, analyze, and prevent adverse events in all phases of transplantation. Early on, our center implemented a process that was owned by the transplant department and met the regulations. It involved a weekly review of all adverse events (AE) by the transplant quality and leadership team, the use of a modified Failure Modes and Effects Analysis (FMEA) tool to assess and prioritize the level of risk for each AE, contacting each unit managers where AE's were occurring to inquire as to what had occurred and why, what was being done in regards to prevention, and ensuring that these individual documented interventions to close the loop.



The process was very time consuming and ultimately, ineffective in producing large scale, sustainable change. We knew that "just meeting the regs" was not sufficient. We wanted a more comprehensive process, with expanded accountability and buy-in that would provide greater opportunities, a more thorough analysis, in short, a process embedded with real rigor and integrity. The reality of our current process was that we lacked the full spectrum of resources, expertise and buy in from the people closest to the problems. Recognizing the need for change, we resolved to change this silo-ed approach. We needed to create an integrated AE event process for all areas of the hospital that touched transplant patients, expanding accountability, and creating buy-in, if we were to take it to the next level and ensure a meaningful impact on the AE management process.

Approach/Methodology

In the spirit of continuous improvement and PDCA, our approach was to focus on the insights learned from evaluating our process. In the next cycle we wanted to address our goals of sustainable change, and greater accountability and buy-in. Our root cause, as mentioned earlier was that we lacked the full spectrum of resources, expertise and buy in from the people closest to the problems. We identified all relevant stakeholders in the medical center responsible for transplant patients. We invited these stakeholders to a meeting to discuss the required regulatory components of AE management and to develop a shared vision of what we wanted to accomplish. This enhanced methodology included bringing potential adverse events to a larger audience. This audience turned in to the monthly Transplant Safety Huddle.

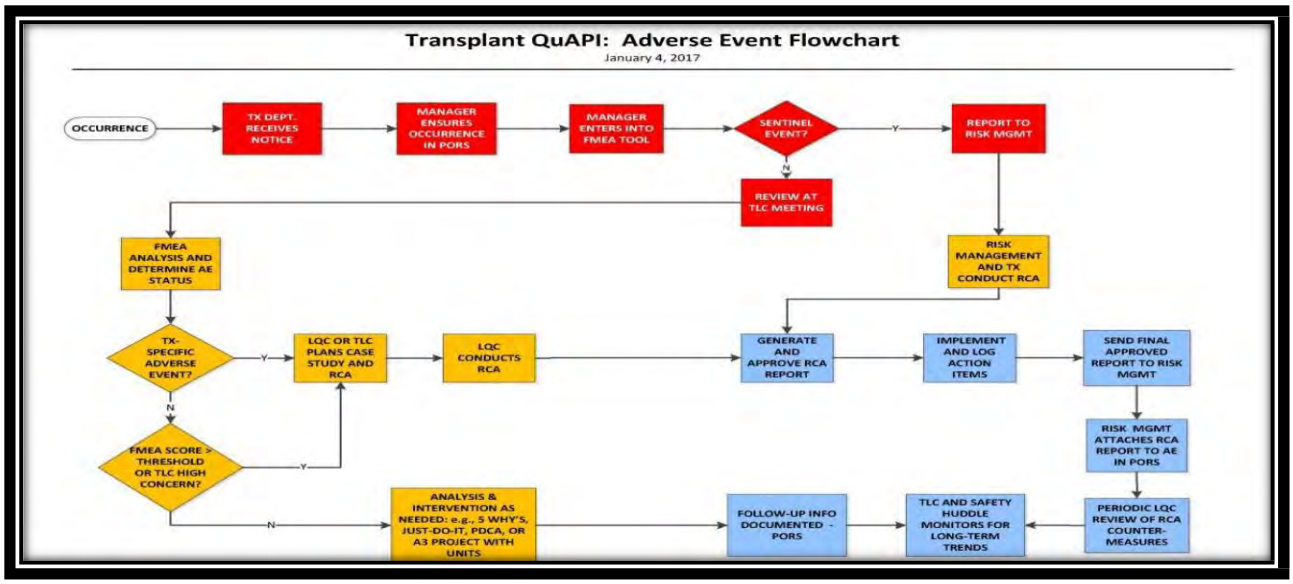
To prepare for the monthly meeting, members of the transplant leadership team ensure that all potential and actual adverse events are entered into the hospitals Patient Occurrence Reporting System (PORS), no matter how they are initially identified, e.g., chart review, verbally reported to manager, etc. so we have one repository to work from. Then, the transplant QAPI team conducts a thorough review of all events at the weekly QAPI leadership meeting. Next, this team puts all events into a FMEA model to identify, analyze, trend and risk stratify each event. This allowed for the identification of key risks in all phases of transplantation. From here, high frequency, high risk or "odd" events are identified and then brought to the Transplant Safety Huddle meeting.

This meeting includes manager and practitioner representation from: 7 inpatient units, Transplant Clinic, Laboratory and Transfusion Services, hospital risk management/accreditation, pharmacy medication safety officer, transplant administration (regulatory analyst, nurse educator, quality analysts and senior quality leaders, abdominal and cardiothoracic transplant managers, assistant director and director).

Collaboratively, the group analyzes AE's, provides validation as to whether the AE is a widespread problem, and identifies if another area has already solved the root cause of the problem so a quick win can be had. If not, a deeper root cause is searched for, including noting if the issue is man, machine, process or environment related. Solutions are discussed and the group comes to consensus on next steps. New processes are assigned to and owned by those who can impact change in their respective areas and follow-up on the solutions implemented.

Findings/Solutions/Conclusions

The establishment of the monthly multidisciplinary Transplant Safety Huddle has brought AE management to a new level in our facility. Now, with the right people at the table, we turned an overwhelming task for the transplant department, e.g., dealing with AE's on the small scale in a silo, to solids wins across the hospital with ownership and buy-in from the full transplant multidisciplinary team, creating large scale impact and assured sustainability. Examples of some of these wins include new processes for managing a) the administration of IVIG b) blood administration scanning/safety check to prevent the administration of incorrect blood products, and c) immunosuppression drug ordering and lab monitoring to decrease organ rejection, to name a few.



Implications/Relevance

Implementation of the Transplant Safety Huddle has produced many other benefits that all transplant centers could benefit from including:

- improved communication and transparency, removing barriers and silos between transplant and hospital units and departments who care for transplant patients
- development of strong and trusting working relationships with hospital risk management/accreditation and unit and department leaders
- a proactive approach to identifying problems, decreasing "crisis mode" responses

Deborah Erickson, BN, MS, PhD, RN; Darren Flynn, MBA, LSSMB, PMP; Lauren E. Kearns, MSN, RN-BC; Daniel J. Tounsel, RN, MPA, JD

ABSTRACT C1-O

ABO VERIFICATION POLICY CHANGES – WE MAPPED THE COMPLEX REQUIREMENTS IN AN EASY TO FOLLOW FLOWCHART

Carolyn Swann, RN, MBA; University of Texas Southwestern Medical Center, Dallas, TX

Problem/Situation:

ABO verification is a complicated process involving the coordination of multiple team members to ensure critical data points are verified. The accuracy of the verification is a priority in ensuring that the correct organ is transplanted into the correct recipient. The event of an incompatible transplant is rare, but the outcome can be devastating. In an effort to eliminate safety gaps and risks, the OPTN implemented changes to the ABO policy on June 23, 2016. In 2015, our team began preparing for ABO Determination, Reporting and Verification Policy changes. The changes to the verification process added an additional layer of complexity, prompting our team to reassess our entire verification process. Our goal was not only to meet the new requirements, but to drilldown on our current workflow, address any area(s) of potential risk, and develop a simplified, concise process that all team members could consistently follow.

Methods:

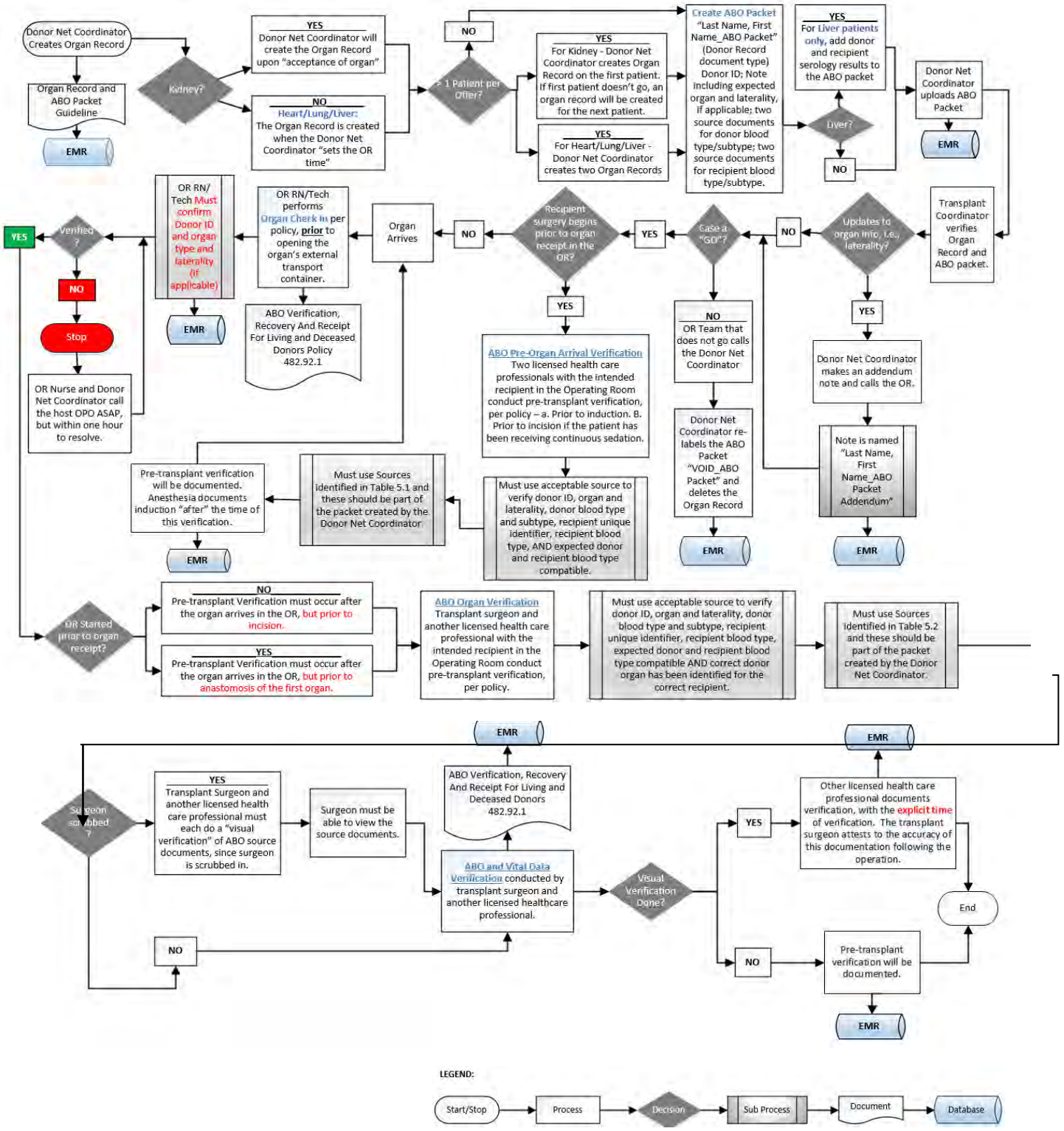
Utilizing a multidisciplinary approach, we involved representation from all departments/teams critical to the process: Donor Net Coordinators, Transplant Coordinators, OR, Anesthesia, HLA, Transplant Administration, Quality and Compliance, Transplant Surgery, HIM and our Electronic Medical Record team. The first step was a comprehensive review of all policy changes. Once a clear understanding of the changes in policy was established, we cross walked the policy against our current workflow, closely examining each team member's role and each specific process, from time of organ offer to transplant completion.

Findings/Solutions:

Areas of opportunity were identified and targeted for change. Certain tasks were segregated and reallocated or modified to ensure redundant safety checks throughout. A critical component of the project was gathering the source documents containing key elements required for verification into an electronic packet, accessible to only members of the team. The attached flowchart was created to incorporate the ABO policy requirements and reflect our journey of a reworked roadmap, from offer to transplant. This flowchart serves as a great training tool for all team members, as well as a quick reference guide.

Relevance/Conclusion:

Using the ABO flowchart, team member understanding of process changes, and the impact of their role on patient safety, has improved significantly as evidenced by feedback and work performance. Effective July 1 we are at 100 percent compliance with OPTN policy changes. Ongoing, focused education and retraining, supplemented with tools, such as the flowchart, continues.



Carolyn Swann, RN, MBA; Rudy Arispe, RN, BSN; Keely Correa, BS; Priya Dandekar, MBA/MHA; Cortney Hockett, RN, MSN; Cheryl Kaplan, RN, MBA/MHA; Sarah McCoy, BFA; Laura Restall, RN, BSN; Linnea Tolbert, RN, BSN

ABSTRACT C1-P

REDUCTION IN KIDNEY PANEL OF REACTIVE ANTIBODIES SCREENING COSTS

Cecile Aguayo, University of Utah Hospital and Clinics, Salt Lake City

Purpose: The Panel of Reactive Antibodies (PRA) provides a patient's risk of producing antibody on re-exposure to the specific donor allogeneic Human Leukocyte antigens (HLA) at the time of kidney transplantation. Presence of an antibody against donor antigen may result in either an incompatible cross match or acute rejection after transplantation. Antibody concentrations can vary significantly over time. Some remain stable and vary little, some appear de novo, and others disappear.

Currently, sera of recipients with PRA = 0% (low risk patients) are screened quarterly, **alternating** between ***single antigen bead test*** (more expensive) and ***rapid PRA test*** (less expensive). Recipients with PRA >0% are screened quarterly using single antigen bead test only.

HLA antibody screening represents a large portion of the total pre-transplant evaluation expense, 41% in 2015. In April of 2016, our program implemented a protocol to reduce the cost of PRA screening in zero PRA kidney recipients on the waiting list.

Practice: The new protocol proposes screening quarterly sera of recipients with PRA= 0% using rapid PRA test only, unless they have had any sensitizing events in the interval between screens. If recipients with PRA=0% are found positive with the rapid PRA test, they will be reflexed to single antigen bead testing and continue to be tested with this test until they become PRA= 0% again. Recipients with PRA >0% will continue to be screened quarterly using single antigen bead test only.

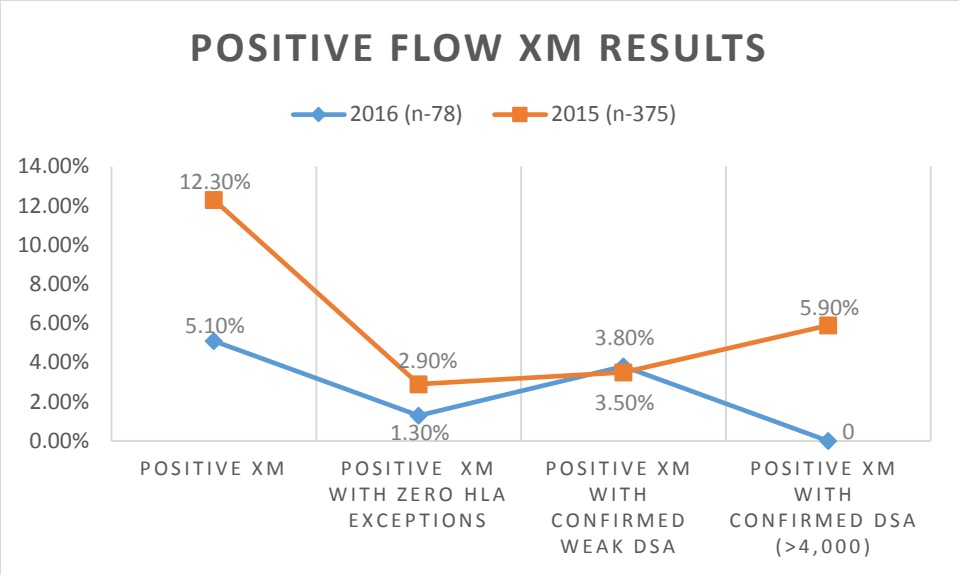
The proposal to screen quarterly recipients with PRA= 0% with rapid PRA test will save $1,600 annually per patient. Currently, approximately 60% of recipients are 0% PRA.

Compared to the single bead antigen test, the rapid PRA test has lower sensitivity for detection of antibodies against low-expressing antigen loci, including some antigens of HLA-C, DQ and DP loci. The lower sensitivity of the rapid PRA test might result in under detection of some HLA antibodies in sensitized recipients. This might lead to an increase in the number of unexpected positive flow crossmatch results.

To determine if the proposed change in antibody screening of recipients with PRA = 0% will produce a significant increase in the number of unexpected positive flow crossmatch results, the H&I Laboratory will produce a quarterly report of the total number of crossmatches performed during the quarter, including the number of unexpected positive flow crossmatch results. These results will be compared with the number of unexpected positive flow crossmatch results obtained between January 1st and December 31st 2015. These results will be available for review by members of the transplant program to make decisions about continuing or reversing back to current screening protocol.

Preliminary 2016 Q2 Findings:

78 flow crossmatches were performed from April-June 2016, of which 4(5.1%) were positive cross match. In 2015, 375 flow crossmatches performed, of which 46 (12.3%) were positive. Thus far, we have not seen a % increase of unexpected positive crossmatch, most likely due to lab's ability to avoid DP antibodies.



Our preliminary 2016 Q2 findings show approximately 62% of recipients are 0% PRA (119 patients). 52% of these patients are under Medicare (with 48% under private insurance). Based on the estimated % of Medicare recipients, the total cost savings for the Q2 2016 (April – June, 2016) is $45,588. The anticipated annual saving estimate is $91,176 to our Medicare cost report.

Savings per lab with negative results	**-$800**
Savings per lab with positive results	**-$210**
Total Estimated Annual Savings to SOT	**-$91,176**

Implications: Pre-transplant claims for Medicare Beneficiaries are paid by the Solid Organ Transplant at 100% of the billed charges. These expenses make up a large portion of the costs allocated to the transplant encounter. Reducing pre transplant evaluation expenses increases profitability of the transplant encounter and reduces the overall cost per transplant case.

Cecile Aguayo BSN, RN; Fuad Shihab MD; Julio Delgado MD; Jeffery Campsen MD; Antoine Clawson; Kim Phillips RN, MSN; Doug Ostler BSN, RN; Heidi Shaw BSN, RN; Liz McLaughlin BSN, RN

CATEGORY 2:

Quality assurance/improvement/transplant pharmacoeconomics

ABSTRACT C2-A

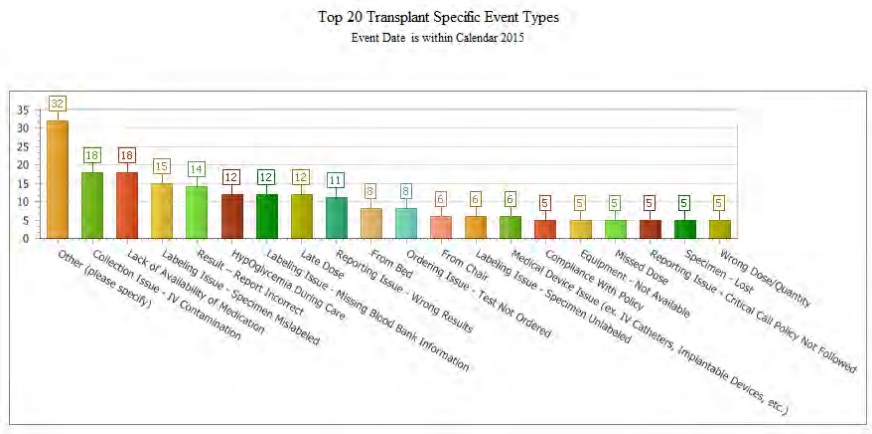
DEVELOPMENT OF A ROBUST ADVERSE EVENT TRACKING/TRENDING PROGRAM

Martha Stipsits, RN, BSN, MHA
Transplant Center at Barnes-Jewish Hospital in St. Louis, MO

Problem/Situation: Adverse event tracking is a Centers for Medicare and Medicaid Services (CMS) condition of participation and has been an active hospital-wide initiative for many years for the general patient population. There was no clear method for tracking transplant specific adverse events in all phases of transplantation. In 2015, we developed a plan to identify and track transplant specific adverse events. This allowed for thorough analysis and trending of adverse events leading to various performance improvement initiatives. This opportunity has created a more robust quality program for solid organ transplant patients.

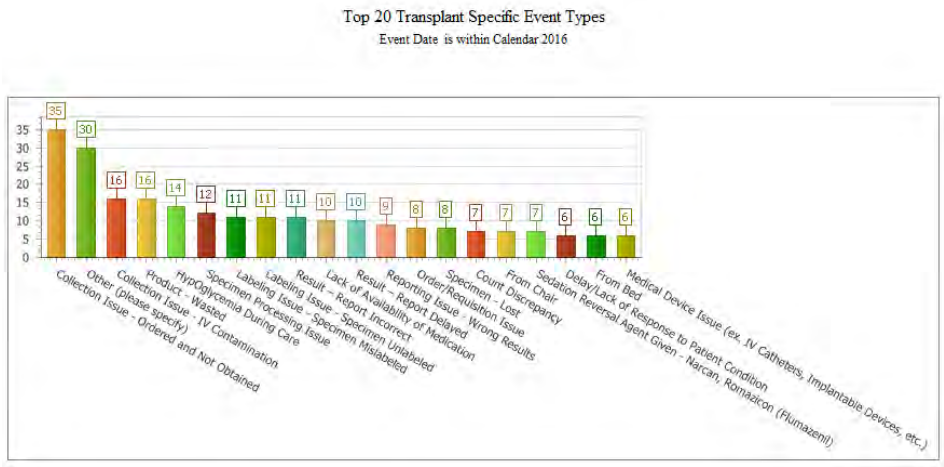
Methods/Practices/Interventions: A manual process was developed by the Transplant Managers and Transplant QAPI team for tagging adverse events entered into the hospital-wide event tracking system. Transplant candidates, recipients, and living donors in all phases of transplant are identified through a process of weekly reconciliation of every adverse event entered into the hospital-wide system against our known transplant population database. Once a patient is appropriately identified as a transplant patient, the event file is tagged by specific organ, which allows events to be analyzed.

Reports can then be generated, reviewed, and interpreted for tracking and trending purposes based on a number of criteria including event type, location, and severity. Reports are reviewed monthly by the core quality team, which consists of Transplant Managers, Transplant Quality Specialists, and the hospital Patient Safety and Quality Specialist assigned to Transplant Services. Reports are summarized and presented at multidisciplinary QAPI team meetings for review, further analysis, and discussion as needed.



During the initial review and breakdown of reports, we discovered many Laboratory errors entered with the specific event type of "other."

After a closer review of these "other" events, a need was found to capture the evaluation and post-transplant patients who arrive with numerous lab tests ordered in the system, but do not get all of them drawn on their initial visit, potentially causing delays in treatment. A request was submitted to add an additional type for "Labs Ordered, Not Obtained." This allows Transplant



Services to track and trend this specific event over time. After the addition of this specific event type, data demonstrated it was the most commonly reported event for transplant patients. This was observed consistently in each of the three months following its addition.

The thorough analysis of this specific event type led to a performance improvement project involving multiple departments across the hospital including Transplant, Laboratory Services, Health Information Systems, Registration, and Phlebotomy.

Findings/Solutions/Conclusions: As a result of our adverse event tracking plan, the analysis of adverse event trends led to robust performance improvement efforts. The transplant core quality team has been invited to participate in hospital level Patient Safety debriefings, root cause analysis, cause mapping meetings, and performance improvement projects with ancillary support areas caring for transplant patients hospital-wide.

Adding the “Labs Ordered, Not Obtained” specific event type and participating in the performance improvement project that followed will positively impact the care of not only transplant patients, but the care of all patients who obtain outpatient Laboratory Services at our hospital.

Implications/Relevance: The ongoing effort to integrate adverse event tracking for transplant patients within the hospital-wide system takes diligence, persistence, and a continuous reach toward improvement. What started as a general review of events, led to a reliable system of identifying and tagging transplant patients along with the addition of the specific event type, “Labs Ordered, Not Obtained.” Subsequent review led to a performance improvement project that will benefit all patients who utilize outpatient Laboratory Services at this hospital. Through continued and ongoing review of events, Transplant Services has been included in Patient Safety debriefing, root cause analyses, and performance improvement projects with multidisciplinary team members throughout the hospital. Through close collaboration with our partners in hospital Patient Safety and Quality, the overall quality of the Transplant Program is more robust and comprehensive.

ABSTRACT C2-B

USING LEAN SIX SIGMA, HOSHIN KANRI AND KATA TO CONNECT CONTINUOUS IMPROVEMENT FROM HOSPITAL STRATEGY TO THE FRONT-LINE STAFF IN A PEDIATRIC TRANSPLANT CENTER

Tony Manry, MS, MBA, Boston Children's Hospital, Boston, MA

Problem/Situation:

Our institution is well regarded for its use of Lean Six Sigma to improve clinical efficiencies, patient safety, and quality. Previous work at our institution has shown these methodologies can be used together to improve efficacy of the quality improvement process by combining tools such as process mapping, visual management systems, PDSA, and failure mode effects analysis[i,ii,iii]. This work looked at the effectiveness of adding Hoshin Kanri and Kata to this toolkit to enhance continuous improvement (CI) work in a multidisciplinary pediatric transplant center. Our objective was to connect hospital strategy to the CI work of transplant clinicians and front-line staff using Lean Six Sigma tools for measurable results and increased engagement.

Approach/Methods/Practices/Interventions:

A team of Lean Six Sigma experts and clinical experts adhering to standard Lean Six Sigma DMAIC methodologies took a unique approach to addressing a complex problem of increasing adherence to CMS FQAPI regulations while simultaneously achieving meaningful results and enhancing provider engagement in a high volume pediatric transplant center. Standard Lean Six Sigma tools included value stream mapping, visual management system, rapid PDSA cycles, standard work and balancing work loads. Kata boards following traditional DMAIC and PDSA cycles were completed by clinicians and front-line staff to address opportunities for improvement in their designated clinical areas. The kata boards are displayed on the Center's Hoshin Kanri with clear illustration of the relationship between the Center's continuous improvement efforts and Hospital strategy. Kata boards are updated regularly at the Hoshin and transplant team QAPI meetings.

Findings/Solutions/Conclusions:

Figure 1 illustrates the Center's Hoshin Kanri containing individual Kata boards (Figure2). Prior to the implementation of Hoshin Kanri and Kata Boards, quality improvement efforts spanning across a multitude of clinical teams often failed to gain traction, lacked discipline, scope and frequently languished without achieving meaning results. Early efforts with these tools illustrated great success (Figure 3), but also identified the need to limit the number of continuous improvement efforts during each iterative cycle. The total number of completed continuous improvement projects with a clinical focus increased from zero to three in the first year. The second iteration improved the balance between clinical and front-line staff CI efforts. Hospital administration appreciates the visual linkage between hospital strategy the Center's CI focus. The tools also enhance the CMS FQAPI requirements for quality focus and CI at the

multidisciplinary team level. Although not specifically measured, anecdotal evidence suggests that provider and staff engagement subjectively increased over the two CI cycles.

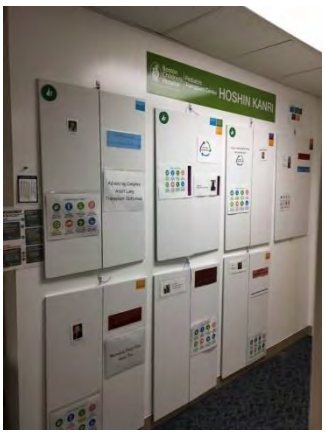
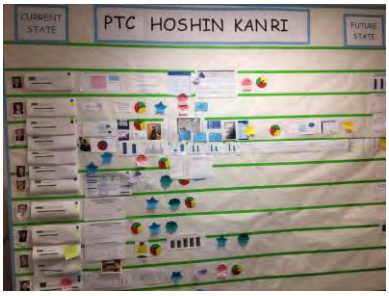


Figure 1: Center's Hoshin Kanri illustrating CI Kata Boards with direct linkage to hospital strategy.

Figure 2: CI Kata Board (inside) illustration PDSA cycles.

Figure 3: The Center's early Hoshin Kanri illustrating CI efforts with steady incremental progress.



Implications/Relevance:

A combination of Lean Six Sigma tools, Hoshin Kanri and Kata can enhance continuous improvement work in a multidisciplinary pediatric transplant center. The tools effectively connect hospital strategy to the CI work of transplant clinicians and front-line staff to achieve measurable results and increased engagement. Although not studied, these tools were felt to increase provider engagement and influence cultural changes surrounding clinician behaviors and practice.

Authors:
Tony Manry, MS, MBA
Laura O'Melia, RN, MSN, CPNP
Maureen Jonas, MD

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[i] Manry, T., Brightman, H., Daniels, L., Hicks, P., Guidetti, G., and Allen, CK. "Using Lean Six Sigma and Live Simulation to Improve Patient Flow in an Outpatient Liver Transplant Clinic" Oral Abstract, *IPSSW* 2016.
[ii] Manry, T., O'Melia, L., Garrigan, K., Elisofon, S. "Using Lean Six Sigma and Live Simulation to Improve Patient Flow in an Outpatient Liver Transplant Clinic" Poster Presentation, *UNOS Transplant Management Forum*, Indianapolis, 2016.
[iii] Brightman, H., Vlassakova, B., Aspinwall, S., and Allan CK. "Blending Simulation and Lean Six Sigma Methodology to Enhance Patient Safety." Oral Abstract. *IPSSW* 2015.

ABSTRACT C2-C

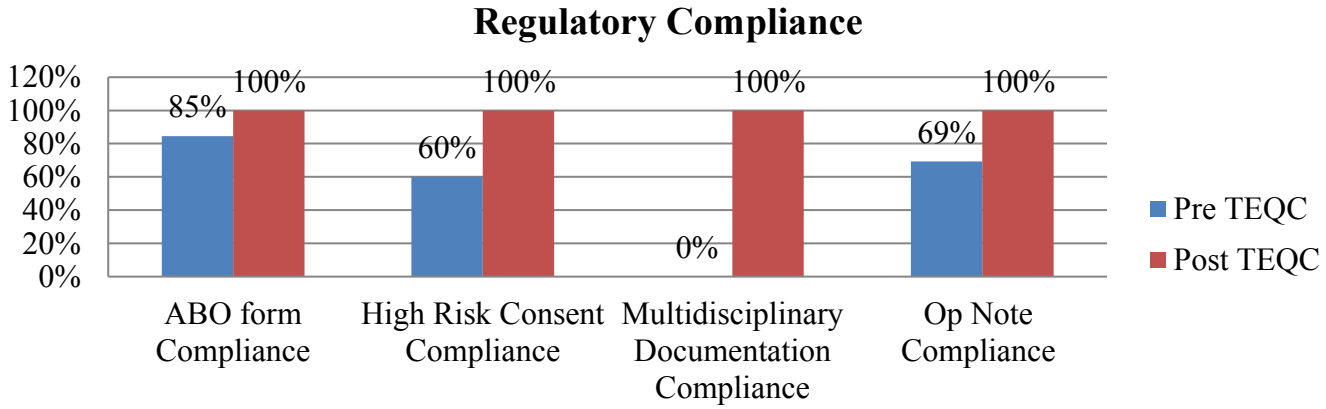
PHYSICIAN & ADMINISTRATION COHESIVENESS: IMPROVING TRANSPLANT QUALITY, COMPLIANCE, AND VOLUME

Rachel Goldsmith, MPA, CHI St. Luke's Health Baylor College of Medicine Medical Center, Houston, TX

Problem: In a large tertiary academic medical center four distinct solid organ transplant programs, Heart, Lung, Liver and Kidney, existed without a cohesive medical and administrative leadership team. The center lacked physician and administrative alignment, direction and accountability. This resulted in an absence of streamlined processes for clinical decision making and analysis of quality improvement opportunities. Overall, the transplant administration team noticed similar quality and compliance issues across all four transplant organ groups, without a common approach to resolve these issues.

Methods: With the goal of improving patient outcomes, regulatory compliance and programmatic alignment, one physician leader was appointed Section Chief of Transplant and empowered both by the hospital and the academic partner to develop a cohesive transplant program. The Section Chief of Transplant worked in collaboration with transplant administration to address opportunities for improvement across all organ programs. First, we brought both our academic and private physicians together to work as one cohesive team, providing education on the impact of regulatory visits and guidelines. Additionally, we reassessed our medical and surgical leadership team to maximize programmatic results and patient care outcomes. The Section Chief of Transplant also began mentoring medical/surgical directors to enhance their leadership skills and clinical performance. The Section Chief of Transplant collaborated with transplant administration to create the Transplant Executive Quality Committee in February 2015, comprised of the respective transplant medical/surgical directors, Chairman of Anesthesia, Chairman of Surgery, and transplant and quality administration, to analyze every transplant case in real time with a focus on identifying opportunities for improvement. The committee meets for one hour every week and is mandatory for all members to attend. The physician participants found the forum so beneficial that the committee's purpose was expanded to include all organ offers, regulatory updates, programmatic initiatives, status of prolonged post-transplant hospitalizations, and length of stay. The committee developed a streamlined process for reviewing adverse events as a multi-organ team to resolve transplant issues in real time. The committee also reviewed patient survival and mortality to analyze programmatic risks and opportunities. The Transplant Executive Quality Committee allows physicians to address organ-specific issues with a programmatic resolution. Lastly, the creation of multi-organ outreach team increased transplant volumes and referrals by enhancing physician participation to improve communication and relationships with referring physicians and dialysis centers.

Findings: As the committee gained momentum, additional projects were accomplished including compliance with ABO verification forms, high risk donor consents, multidisciplinary team documentation, operative note documentation, and improved accuracy in organ refusal codes.



Programmatic quality and clinical outcomes were improved by the integration of physician leaders in a multi-organ transplant center, including the development of clinical protocols, decreased prolonged inpatient hospitalizations, decreased length of stay, increased transplant volumes, improved analyses of adverse events, and improved 1 year patient and graft survival.

	2015	2016
Transplant Volume (annualized)		
Heart	21	36
Lung	15	35
Liver	70	85
Kidney	62	86
Median LOS (index admission)		
Heart	59	41.5
Lung	15	14.5
Liver	13	14
Kidney	5	4.5

Implications: The transplant program has experienced improved physician and administrative relationships, regulatory compliance, quality, and growth through cohesion of the physician leadership team. Rather than operating as four independent organ groups, the transplant physician leaders now operate as one team to resolve transplant issues in real time. This culture change has yielded improved communication, positive outcomes, and heightened accountability, leading the way for a new standard of care.

Felicia De La Garza, MSN, RN, Rachel Goldsmith, MPA, John Goss, MD, Todd Rosengart, MD

ABSTRACT C2-D

ROAD MAP TO RECOVERY AFTER KIDNEY TRANSPLANT IS ASSOCIATED WITH DECREASED LENGHTH OF STAY

Elizabeth McNally, MS, Froedtert Hospital, Froedtert & Medical College of Wisconsin, Milwaukee, WI

Problem: Prolonged length of stay is a costly complication of kidney transplantation. In 2013, we identified our length of stay (LOS) to be longer than the University Healthcare Consortium (UHC) Association of American Medical Colleges (AAMC) benchmark cohort. Our observed deceased and living donor kidney transplant recipients LOS was 10 and 6.5 days (respectively), compared to 7 and 5 days (respectively) for the CY2010 -CY2013 benchmark cohort.

Approach: We initiated a workgroup to identify patients' and staff expectations post kidney transplantation as well as barriers to discharge.

Findings: We identified lack of patient's awareness of hospital course post transplantation, variances in the inpatient plan of care, inconsistent initiation of patient's education and lack of dialysis options for patients with delayed graft function (DGF) as the main contributing factors for our prolonged LOS.

Solutions: To ensure that standardized care was being delivered during the post-operative stay, we developed a patient-centered plan, Roadmap to Recovery after Your Kidney Transplant (See Table 1). We created it in a poster and handout format. Its aim was to serve as a reference of daily goals and outcomes for the patient and the healthcare team. It sets the daily outcome expectations for the patient and shows the anticipated discharge date. It also helps in ensuring that the nursing staff is aware of the expected plan of care. The poster is hung in the patient's room on day of admission. We review it with the patient and his/her support person on a daily basis. The handout version is given to the patient along with his/her education binder on post-operative day one.

You will be discharged at 5-7 days	Evening after Surgery	Post-op Day 1	Post-op Day 2-3	Post-op Day 4-5	After Discharge
What To Do Today	• Ask questions! • Do your breathing exercises (incentive spirometer-IS) - 10 times every hour while awake • Walk once with help • Press your pain button or call the nurse if you have pain	• Ask questions! • Use your IS 10 times every hour • Walk 4 times with help • Press your pain button or call the nurse if you have pain • Inform your support person of transplant class date and time	• Ask questions! • Use your IS 10 times every hour • Walk 4 times with help • Call the nurse if you have any pain • Review your yellow med card and practice setting up your medications • Attend transplant class as appropriate • Complete the Transplant Review Quiz	• Ask questions! • Walk 4 times with help • Review yellow med card and practice setting up medications • Call the nurse if you have pain • Attend transplant class if not already done	• Check your weight and temperature daily
Tests and Tubes	• Stomach drain (JP) • Tube in your bladder to drain and measure urine (Foley) • IV in your neck to take blood and give you fluid/medicine • Oxygen tube in your nose	• Blood sample every morning • Your weight will be checked • The oxygen tube in your nose may be removed • Fingerstick to check blood sugar	• Blood sample every morning • Daily standing weight • Fingerstick to check blood sugar	• Blood sample every morning • Daily standing weight • Fingerstick to check blood sugar • Central line may be removed • The catheter in your bladder may be removed	• Labs every Monday, Wednesday and Friday
Medicines	• Intravenous (IV) fluids • IV Pain Medication • Heparin shot to prevent blood clots • You will start taking medications to prevent your kidney from failing (rejecting)	• You will take anti-rejection medications • Your pain medicine will be given through your IV	• Pain medicine may be switched to oral form • You will take anti-rejection medications	• You will take anti-rejection medications	• Take your medications as prescribed • Call your coordinator if you cannot take your medicines for any reason
Diet	• Nothing to eat or drink (except pills) • You will have a moist swab to wet your mouth	• Nothing to eat or drink (except pills) • Ice chips in some cases	• Clear liquid diet	• General diet if you don't feel sick	• Follow diet instructions given to you by the dieticians
Activity	• Walk once and stand on a scale • Wear leg sleeves to prevent blood clots	• Walk in hallway with nurse 4 times • Wear leg sleeves to prevent blood clots	• Walk in hallway 4 times (nurse will tell you if you can walk alone) • Wear leg sleeves to prevent blood clots	• Walk in hallway 4 times (nurse will tell you if you can walk alone) • Wear leg sleeves to prevent blood clots	• Use the handouts given to you by the physical therapist
Learning	• Nurse will show you breathing exercises to prevent lung infection • Nurse will give you a Transplant Binder	• Nurse will review your yellow medication card with you • Review your Transplant Binder	• Review yellow med card • Practice setting up your medications • Go to Transplant Class with your support person	• Review yellow med card • Practice setting up your meds • Go to Transplant Class if not already done	• Keep your yellow med card up to date • Review your binder
Discharge Planning	• Case Manager and Social Worker will discuss your home needs with you before discharge • You will see the dietician before discharge • You will see the physical therapist before discharge • You will meet with the pharmacist to review your medications before discharge • You will meet your post transplant coordinator before discharge				• Keep all appointments • Call your coordinator with any questions or concerns • Follow up appointment 7-10 days after discharge

Table 1

Our organization implemented an initiative for nurses to write the expected date of discharge on the patient's white board and update it daily. We believe this has improved patient's understanding and involvement in the discharge plan.

To address the needs of the delayed graft function (DGF) patients, we developed a multidisciplinary DGF clinic that is staffed by a nurse practitioner, post-transplant coordinator and transplant nephrologist. Our case manager collaborates closely with the entire team and creates a work flow to update the entire team on a daily basis regarding the anticipated cases of DGF and plan of care. Regular lab appointments and arrangements for potential hemodialysis are made by the case manager along with the rest of the treating team.

To address the barrier of inconsistent initiation of transplant education, we developed a transplant education schedule to be utilized by nursing staff. It ensures that education is provided and reinforced throughout the hospital stay, and is completed by the anticipated discharge date. We engaged our newly created transplant intensive care unit (TICU) to ensure that education is initiated consistently regardless of the patient's location post-operatively.

Conclusion: Our QAPI program identified LOS as an area of improvement for our program. By developing and implementing the patient-centered roadmap, we were able to drive our LOS down significantly. Our program decreased LOS for deceased donors' kidney transplant recipients from an average of 10.8 days in 2014 to an average of 6.4 days as of January – June, 2016 (See Figure 1).

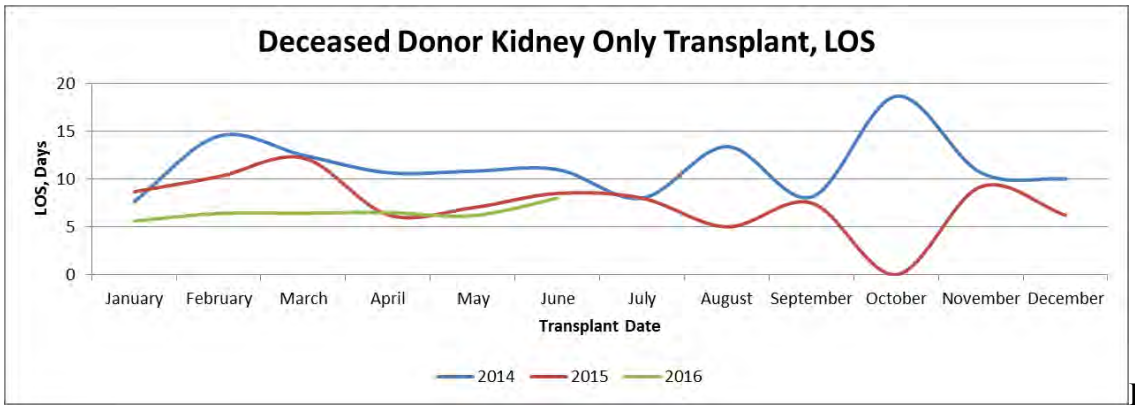


Figure 1

Implications/Relevance: LOS is a major concern for transplant programs, with both medical and financial implications. Creation of a patient-centered roadmap to recovery will lead to clearer patients' expectations regarding their hospital stay. It also serves as a clinical tool to confirm that patients are advancing on daily basis towards their discharge goal. It will contribute to the reduction of the LOS without compromising our patients' safety.

Elizabeth McNally, MS, Deana Fischer, MSN, RN, CCTN, Ehab R Saad, MD, FACP, FASN, MA

ABSTRACT C2-E

IMPLEMENTATION OF ELECTRONIC ABO VERFICATION IN THE OPERATING ROOM FOR SOLID ORGAN TRANSPLANT

Deepa D. Kurup, RN, MSN/MBA
Melanie Merrill-Kennedy, PA-C
Lucile Packard Children's Hospital Stanford
Palo Alto, California

Problem/Situation: The institution initiated electronic ABO verification simultaneously with a process for expected UNOS requirement of pre-organ arrival ABO verification. Issues of non-compliance with UNOS and CMS standards for ABO verification documentation during solid organ transplant were observed. Retrospective review of data since implementation of electronic verification in November 2015 till May of 2016 showed the compliance rate for accurate documentation of the pre-organ arrival ABO verification process to be 74% and organ verification to be 74%. Inaccurate process for documentation is not only a compliance issue as set forth by the transplant regulatory bodies but it is also a patient safety issue.

Methods/Practice/Interventions: Structured A3 thinking tool was applied for problem solving by transplant quality department in collaboration with the operating room leadership. Brainstorming session conducted with the key stakeholders to develop the current state process mapping. Further analysis completed utilizing the cause and effect tool to list all the possible causes and identify the root causes.

Findings/Solutions/Conclusions: Case review conducted on all the incorrect pre-organ ABO verification and organ verification process documentation from November 2015-May 2016.

Process: Inconsistent language in the organ specific surgical form creating confusion to the OR staff; policy language not clear to the staff and it does not reflect the current regulatory requirement.

Personnel: Anesthesia not involved in the pre-organ verification; lack of knowledge about policy requirement to do real time documentation; infrequent transplant cases for staff to assist and keep up with the competency.

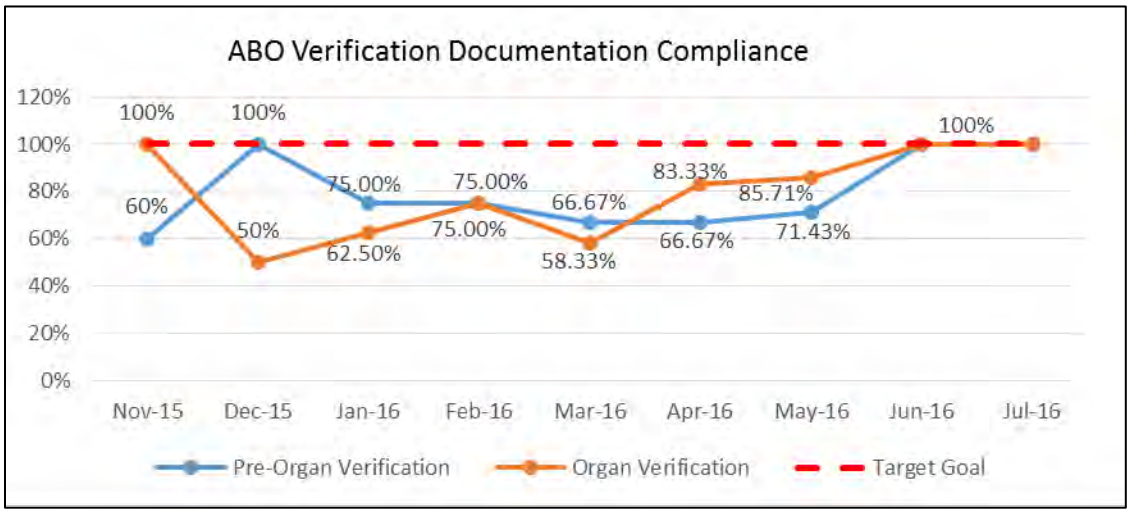
Resources/System: No competency checklist for the staff; lack of visual reminder to use during the transplant surgery.

3 key drivers selected and interventions implemented as the countermeasures.

1) Documentation process standardization: Standardize surgical form for all organ groups. Add anastomosis and organ arrival time to the organ verification timeout form to minimize error with documentation in multiple locations. Completion of pre-organ arrival ABO verification documentation prior to moving patient to OR table.
2) Education/Resource utilization: Education to team during daily huddle and transplant quality meetings. Whiteboard utilization as reminder for anesthesia team to document accurate induction time. Train and assign resource nurse to document pre-organ arrival timeout with the circulating nurse. Policy update to reflect the current practice.

3) Utilization of systems notice in EMR: Utilization of alerts and warning in the electronic medical record as a reminder for accurate and real time documentation.

Upon implementation of the countermeasures in May 2016, the ABO verification for pre-organ arrival and prior to organ implantations is 100% since June of 2016. Activities to sustain the plan are implemented and owners assigned to the plan. Continuous monitoring by transplant quality to monitor compliance with the verification documentation process.



Implications/Relevance: Accurate ABO verification prior to organ transplantation is crucial to patient safety. This performance improvement project was initiated to standardize the documentation process and prevent harm to the patient related to incorrect blood type or organ transplantation.

Authors:

Deepa D. Kurup, RN, MSN/MBA

Melanie Merrill-Kennedy, PA-C

Julie Cahn, MSN, RN, CNOR, RN-BC, ACNS-BC, CNS-CP

ABSTRACT C2-F

Title: *"GENITOURINARY VASCULAR COMPOSITE ALLOGRAFT (GU-VCA) TRANSPLANTATION: ALIGNING INNOVATION WITH REGULATION"*

Contact Person: *Linda Irwin, RN, ANP, CCTC, Director of Compliance*
Massachusetts General Hospital Transplant Center, Boston, MA

Problem:

Vascularized composite allografts (VCAs) were included in the OPTN Final Rule as covered human organs effective July 3, 2014. In November 2014 the OPTN Board approved modifications to the membership requirements for VCA programs that a transplant hospital must identify the specific VCAs they intended to transplant. Transplant programs that perform VCA transplants are now subject to oversight by the OPTN for compliance.

As our VCA Transplant Program was evolving to now perform GU VCA transplants, we sought to align all processes with the solid organ policies and procedures mandated by the OPTN and CMS. This included providing the structure, resources, and multidisciplinary support in collaboration with plastic surgery, urology and sexual health. Heightened sensitivity also needed to be coordinated given the nature and innovation of the surgery.

Approach:

Our Center sought to align the structure of the GU VCA program with the solid organ transplant policies and procedures. This process included:

- *Ensuring hospital support (administrative, financial)*
- *Obtaining UNOS approval to perform GU VCA transplantation*
- *Obtaining IRB approval for the clinical protocol at our institution*
- *Coordination with the Organ Procurement Organization regarding: facilitating donor rehearsal procurements, obtaining consent for VCA donation separate from solid organ consent, listing patient for transplant and the logistics of the donor offer and procurement*
- *GU VCA team's recruitment of patients from plastics, urology/oncology*
- *Aligning process of recipient evaluation with the Transplant Center's solid organ policies and procedures*
- *Multidisciplinary collaboration between transplant center staff (nursing, nutrition, social service, pharmacy, psychiatry, infectious disease consultants), plastics, urology, oncology, sexual health medicine, research coordinator*
- *Listing patient with UNOS and OPO (different from solid organ)*
- *Staff education – operating room, reconstructive surgical care unit staff, transplant center staff*
- *Ensuring confidentiality/privacy for patient (restricting access to patient's medical records – "break the glass")*

- *Post-operative management of patient (who manages patient, post-operative complications, Tiedi forms)*
- *Preparing for media attention with high profile case (meeting with hospital public relations)*
- *Preparing patient for media attention*
- *Preparing for triaging of self referrals to VCA program*

Findings/Solution/Conclusion:

Our transplant center performed the nation's first GU VCA transplant in May 2016. The post-operative management was done in collaboration between the transplant surgeon/urologist, plastic surgeon, transplant physicians and multidisciplinary team members. Successful markers post transplant include: cosmetic restoration, establishment of urinary continence and nerve regeneration. A goal of GU VCA transplantation is also the restoration of sexual function which will be monitored post transplant.

Implications/Relevance:

Genital injuries and diseases resulting in partial or total penis loss can have devastating functional and emotional consequences including compromised sexual and urinary functions, changes in body image and depression. GU VCA transplantation can offer a "life enhancing" procedure that has the potential to be the standard of care for these patients.

Transplant centers that wish to embark on performing these procedures need to ensure that they have institutional support as it is not covered by third party payers. Centers also need to align research protocols with regulatory processes that mirror the solid organ transplant programs to ensure compliance with OPTN regulations. Centers

As the field of VCA transplantation expands, increasing public awareness of VCA donation and transplantation is paramount.

Authors:

Linda Irwin, RN, MA, ANP, CCTC
Dicken Ko, MD
Curtis Cetrulo, MD
Heather Parker, NP
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ABSTRACT C2-G

TITERS OF BLOOD GROUP B PATIENTS USING NON-A1 REAGENT/DONOR CELLS FOR THE PURPOSE OF ABO INCOMPATIBLE KIDNEY TRANSPLANTATION

Prakash Rao PhD, MBA, FACHE, HCLD, NJ Sharing Network, New Providence, NJ

Situation: Blood group B patients are eligible to receive offers from non-A1 or non-A1B kidney donors. Initial transplant center protocols were designed to use non-A1 reagent cells to perform ABO titers for prequalification of patients. Current practice in many institutions involves performing these titers with A1 reagent cells. Since non-A1 cells express weaker antigenicity than A1 cells, the question was, "Why would surrogate ABO titer testing include target cells with higher antigenicity than the donor organ?"

Approach: A comparison was done to determine the significance of A1 versus non-A1 titers in potential "non-A1/non-A1B donor to B patient" transplants. Parallel ABO titer testing was performed on 63 patients' samples using both A1 and non-A1 reagent cells. Pre-transplant titers were performed using donor cells, non-A1 reagent cells, and A1 reagent cells on 17 sample sets at the time of organ offer. Post-transplant outcomes were analyzed on 16 patients.

Findings: Observations in blood group B patients (n=63) were: (a) the average of A1 Pre-transplant IgM results was 3.0 times higher than the average of non-A1 Pre-transplant IgM results [55/18], (b) the average IgM score of A1 was 1.6 times higher than the average IgM score of non-A1 [57/34], (c) the average of A1 Pre-transplant IgG results was 4.3 times higher than the average of non-A1 Pre-transplant IgG results [43/10], (d) the average IgG score of A1 was 2.1 times higher than the average IgG score of non-A1 [46/22].

Titers using non-A1 donor cells were comparable to the titers using the non-A1 reagent cells (Table 1).

#	IgM Titer			IgG Titer		
	Non-A1 Donor Cells	Non-A1 Reagent Cells	A1 Reagent Cells	Non-A1 Donor Cells	Non-A1 Reagent Cells	A1 Reagent Cells
1	2	1	16	0	0	2
2	2	4	32	4	2	16
3	0	4	16	0	2	16
4	2	2	16	1	1	16
5	4	2	8	8	4	16
6	4	4	8	2	2	2
7	0	2	16	0	4	8
8	4	2	16	2	1	8
9	4	2	8	2	1	4

10	4	4	32	2	2	16
11	0	2	16	0	1	4
12	2	4	16	4	2	16
13	1	1	8	0	0	4
14	1	2	8	1	1	4
15	2	4	32	1	1	16
16	4	4	16	2	2	8
17	2	2	32	1	2	8

Post-transplant data was received on 16 blood group B patients who received non-A1 kidneys with a low titer using non-A1 reagent cells (≤4), a higher titer using A1 reagent cells (>4), and a low titer using non-A1 donor cells (≤4); 15 are doing well, 1 patient passed away one month post-transplant with unknown cause of death.

Implications:

Blood group B patient titers against non-A1 reagent cells or non-A1 donor cells were generally low. As expected, A1 titers were generally higher. If A1 titer results were used by transplant centers for prequalification of the patient's inclusion in the "non-A1/non-A1B donor to B patient" transplant program, these patients would have been excluded. Based on our findings, we conclude that the results of using A1 titers for B patients receiving non-A1 kidneys are not clinically significant.

Maria Aguilucho, Donna King, Misty Marchioni, Bridget Figueiredo, Ijeoma OKere, Prakash Rao

ABSTRACT C2-H

IMPLICATIONS OF UNDERESTIMATING THE EPTS SCORE ON PATIENT SURVIVAL ANALYSES UNDER THE NEW KIDNEY ALLOCATION SYSTEM

Meredith J. Aull, Pharm.D., NewYork-Presbyterian/Weill Cornell Medical Center, NY, NY

Background: With the implementation of the new Kidney Allocation System (KAS) in December 2014, the Estimated Post Transplant Survival (EPTS) score was introduced as a new metric to help guide matching of kidney candidates with organ offers, although it is only used for allocation purposes when the EPTS score is ≤20. Candidates with EPTS scores of 20% or less receive increased priority for offers for kidneys with Kidney Donor Profile Index (KDPI) scores of 20% or less. The KAS hopes to improve longevity matching and thus achieve "best use" of each donated organ.

As part of the new KAS, programs are expected to keep the four data fields used to calculate the EPTS score up-to-date. These fields include age, dialysis start date (when applicable), a diagnosis of diabetes, and prior transplant(s). Since dialysis start date is also used to determine waiting time points, candidates without a verified dialysis start date will not receive points for time spent on dialysis prior to being registered on the waitlist.

Problem/Situation: Waitlist management is essential to maintaining these and other data about waiting transplant candidates. If programs utilize EPTS scores to help match patients with EPTS scores above 20 with prospective organs, lack of up-to-date information may lead to a falsely low EPTS score. In addition, transplantation of such patients with falsely low EPTS scores may affect the interpretation of the patient survival data generated based on EPTS score at time of transplant.

At our center, our quality team routinely enters data about our transplant recipients in a database developed for research and quality purposes. This data includes EPTS score, KDPI score, and other data deemed important by our team. A team member noticed that a patient we transplanted had been on the waiting list as a pre-emptive patient (not on dialysis) but in fact, had started dialysis several months prior to receiving their kidney transplant. Listed as pre-emptive, the patient had an EPTS score of 66%; upon re-calculation utilizing the dialysis start date, the EPTS score increased to 81%. Realizing that there might be other patients like this on our waiting list, and knowing that falsely low EPTS scores might eventually affect patient survival analyses, we decided to review all of our patients currently listed as pre-emptive in UNET.

Approach: As of 12/16/2016, we had 313 pre-emptive patients who had been added to the wait list after 5/1/2014, when we had received the dialysis start date data download from CMS, prior to implementation of the new KAS. Each patient was reviewed to determine their current status. Patients who had begun dialysis since the time of listing had their dialysis start dates entered into UNET once confirmed by receipt of the CMS 2728 form. For those patients, EPTS score was captured before and after the entry of the dialysis start date.

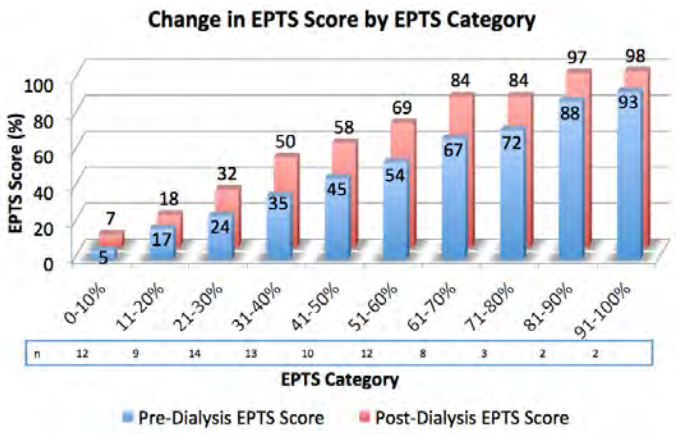
Findings/Solutions/Conclusions: Of the 313 patients, 52 (17%) had been removed from the waiting list due to transplant, death, or transfer to another center, 176 (56%) remained pre-emptive, while 85 (27%) had started dialysis since the time of listing.

Overall, the mean EPTS score for the 85 patients who had started dialysis since the time of listing increased from 38% to 48%. Figure 1a shows the change in pre- vs. post-dialysis EPTS score by EPTS

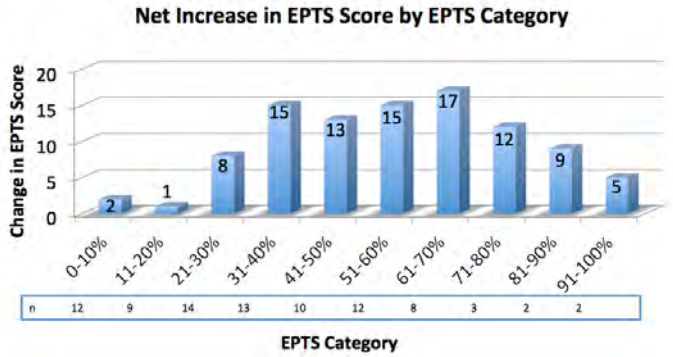
category, while Figure 1b shows the net increase in EPTS score for each EPTS category. As seen in Figure 1c, the effect of starting dialysis was most prominent in the EPTS scores of patients with diabetes mellitus (DM).

Figure 1. Change in EPTS Score After Adding Dialysis Start Date

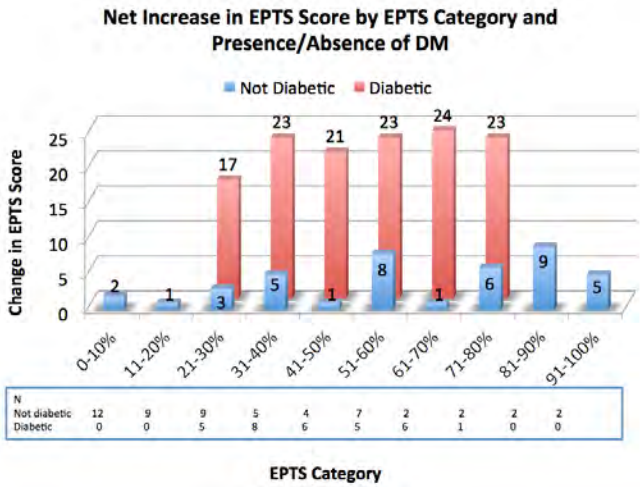
a)



b)



c)



<u>Implications/Relevance</u>:

Transplant Centers are responsible for keeping the clinical information about waitlisted patients up-to-date. This can be a challenging task, especially at centers with large waiting lists. The ability to receive information about dialysis start dates is difficult since it relies on notification from the patient and subsequent request/receipt of 2728 forms from individual dialysis centers. Transplant centers are not able to access their transplant candidates in the CMS web-based data-collection system, and no routine download of this data into UNET is available from CMS, despite its initial availability at the time of KAS implementation. Availability of these options would greatly enhance transplant centers' ability to obtain this important data in a timely fashion. In addition, centers should be cognizant of the significant impact that starting dialysis can have on their patients' EPTS scores, particularly for their patients with diabetes.

<u>Meredith J. Aull, Pharm.D.</u>, Judith Hambleton, RN, CCTC, Katherine Rhee, R.N., Allison Hoffman, Eileen Kang, Sandip Kapur, M.D.

ABSTRACT C2-I

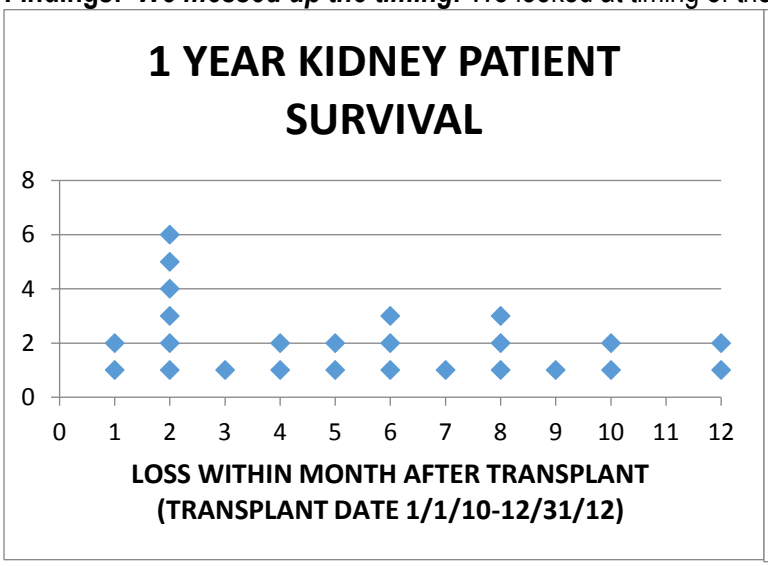
IMPROVING KIDNEY TRANSPLANT OUTCOMES BY CHANGING THE MODEL OF CARE: A DETAILED LOOK AT DATA DRIVEN CHANGE

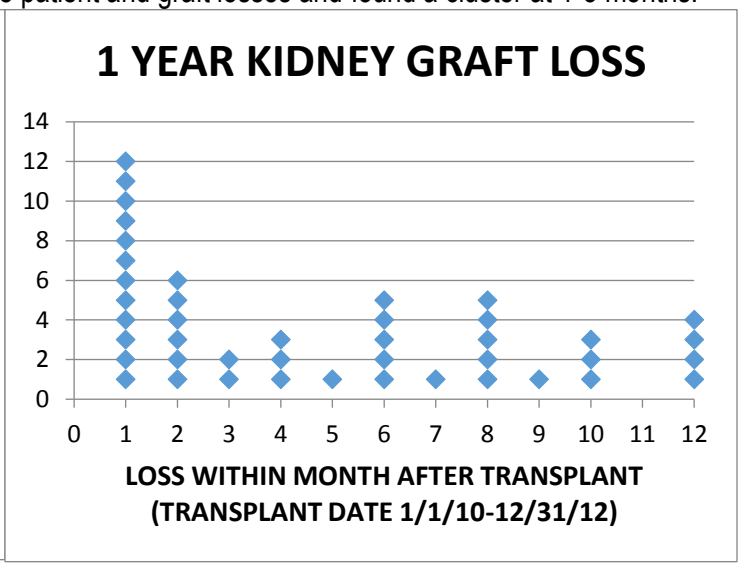
Gwen E. McNatt, RN, PhD, CNN, FNP-BC, Northwestern Memorial Hospital, Chicago, IL

Problem/Situation: Our center's one year kidney patient survival outcomes for the SRTR publication cohorts of July 2013, January 2014 and June 2014 did not meet the threshold described by CMS 482.80: *Conditions of Participation: Outcome Requirements for Transplant Centers*: O-E = 8.48/7.96; O/E = 1.63/1.66 and p value = 0.021/0.022 respectively. The raw graft and patient survival rates for July 2013 (first flag) were 93.42% and 95.79% respectively.

Approach: Between April 2010 and July 2013 we performed three root cause analyses (RCA's) focusing on graft and patient survival. We made a number of changes to recipient and donor selection criteria based on the data but the data also demonstrated that post-transplant management was also a factor in graft and patient loss.

Findings: ***We messed up the timing!*** We looked at timing of the patient and graft losses and found a cluster at 1-3 months.





Figures 1 and 2: Clusters of patient and graft losses by time after transplant

The protocol at that time mandated only 2 visits in that crucial first three month period. Grafts and patients were lost all along the 12 month period, only 2 additional visits were mandated by protocol during that time period post –transplant.

All Push no Pull! We also found that many of these patients (21%) had been lost to follow up or not consistently followed. The system was entirely "push" i.e. the Transplant Nurse Coordinators (TNC) checked labs or answered calls as they were pushed to them, but if a patient did not have labs drawn or did not show up, there were no processes in place to follow up. Additionally, there was no prioritizing of patients by risk or time from transplant. The stable patient who was transplanted 20 years ago received the same "dose" of TNC.

Solution: ***Fix the Timing, Increase the Dose, Add some Pull!*** Our solution was to 1) Increase frequency of visits 2) Increase the "dose" of TNC in the first year post transplant or any other high risk time. 3) Implement TNCs proactively reaching out ("pull") to patients in the most high risk period.

Frequency of visits was accomplished by changing the protocol. The total number of protocol visits increased from 4 to 12 in the first year. This was implemented in April 2014.

Figure 3: Increase Frequency of Clinic Visits

As the nephrologists were all participants in the QAPI process and could clearly see the need, we did not need additional buy-in. We did have some challenges opening up additional slots initially but we blocked out future clinic appointments so that the slots are available at discharge. All appointments are made for the patients at discharge. Compliance with appointments are tracked on our QAPI dashboard. First quarter of FY17 – we had 78% compliance with patients completing their proscribed visit schedule in the first 3 months and 93% compliance in the next 9 months.

The second tactic involved several changes: 1) Assign patients to a TNC 2) Develop lab process that prioritizes patients in first year or with acute problem to top priority, patients 1-2 years out or with chronic issues such as HIV or HBV risk to intermediate priority for lab review and stable long term patient labs to low priority. Labs from patients in the low risk category are checked weekly by clinic nurses freeing up the TNCs to focus on the high and intermediate risk patients labs and also giving them time to call their patients. 2) Proactive calling protocol was implemented. TNCs make contract with their patients at least weekly in the first 3 months. We have continued to have some issues with meeting lab goals (missed goal 14 days in 1st Q FY17) and with contact compliance (32% in 1st Q FY17). But with improved staffing and processes we are optimistic that we will continue to see improvement. The new model and protocols were implemented in October 2014.

Results/Implications: Our kidney and graft survival rates have continued to improve with our most recent cohort ending 12/31/15 at 95.5% and 97.5% for graft and patient survival. We have not flagged for OPTN or CMS review since that June 2014. Our last published cohort is in the table below. We believe that data driven improvements are more likely to improve outcomes as they target the actual factors contributing to those less than optimal outcomes.

ADULT GRAFT SURVIVAL	**June 2014 PSR**		**ADULT GRAFT SURVIVAL**	**December 2016 PSR**
Number of transplants	541		Number of transplants	447
Observed	36		Observed	19
Expected	22.53		Expected	15.421
CMS Criteria			CMS Criteria	
O-E	13.47		O-E	3.579
O/E	1.6		O/E	1.232
p-value	0.005		p-value	0.211
ADULT PATIENT SURVIVAL	**June 2014 PSR**		**ADULT PATIENT SURVIVAL**	**December 2016 PSR**
Number of transplants	541		Number of transplants	397
Observed	20		Observed	7
Expected	10.63		Expected	6.977
CMS Criteria			CMS Criteria	
O-E	9.37		O-E	0.023
O/E	1.88		O/E	1.003
p-value	0.007		p-value	0.547

Table 1 Improvements in Graft and Patient Survival

Gwen E. McNatt, RN, PhD, CNN, FNP-BC, Christianna Turner, BS, Kathryn Thomas, MSN, RN, SCRN

ABSTRACT C2-J

DISSEMINATING QUALITY PRACTICES THROUGH COLLABORATION AND COMMUNICATION

Hedi Aguiar RN, MSN, CCRN-K, Organ Donation and Transplantation Alliance, Vienna, VA

Situation: The Transplant Quality Resource Guide (TQRG) is an online roadmap which incorporates best practices for developing and sustaining high quality, patient-centered excellence in donation and transplantation. Seven key strategies are addressed: Institutional Vision, Dedicated Team, Clinical Operations, Patient Centered Care, Financial Intelligence, and Performance Improvement. The TQRG was authored by a council of transplant leaders in 2013; however, despite valuable content it was not being actively utilized by the community, due to a lack of awareness and communication. Additionally, supporting tools to the TQRG, that could be beneficial to any transplant program seeking practical and concrete ways and examples to improve their transplant program operations, processes, and practices, did not exist.

Approach: In order to address the knowledge and communication gap, as well as to create a hub for peer-shared resources to support the TQRG, two strategies were employed. The first strategy was to generate awareness of the TQRG through active promotion of this roadmap with the help of postings on social media channels, listservs, and organizational newsletter. The second strategy was to create a national multidisciplinary workgroup, the Transplant Resource Tools (TRT) workgroup, comprised of representatives from various size transplant programs and Organ Procurement Organizations, representing different roles and expertise, to collaboratively identify tools, materials, and published references to underpin and supplement the seven key strategies and respective change concepts outlined in the TQRG.

Solutions: The TRT workgroup, formed in June 2015, over the period of one year, gathered more than 130 templates, policies, job descriptions, references and other resources to support the TQRG. With the help of the workgroup and social media, as well as other communication tools, based on google analytic metrics, the number of hits to the TQRG and Tools site has increased seven-fold. Comparing the same time frame from 2015 prior to the workgroup formation to the same time frame of 2016, an increase in page views was observed from 864 views to 6,559 page views.

Relevance: Individual organizations can create tools and materials resulting in successful outcomes, however, unless they are shared externally and deliberate communication and collaboration strategies are employed, other transplant programs cannot benefit. Collaboration and communication are crucial strategies to disseminating quality practices.

Authors: Hedi Aguiar, RN, MSN, CCRN-K; Jennifer Milton, BSN, MBA; LeAnn Swanson, MPH

ABSTRACT C2-K

Prognosticating Transplantation, Mortality, and Removal Rates From the Waitlist Using the Kidney Transplant Morbidity Index (KTMI)

Daniel Pieloch MS, RD, Robert Wood Johnson University Hospital, New Brunswick, NJ

Problem: Nearly half of all kidney transplant candidates who are placed on the waitlist at are eventually removed for reasons other than receiving a transplant at our center. This results in our program utilizing significant resources in a non-value added patient population. The Kidney Transplant Morbidity Index (KTMI) is a validated prognostic tool using pre-transplant comorbid conditions to help predict post-transplant outcomes. We looked to explore whether the KTMI could also be used to predict waitlist outcomes in an effort to improve productivity at our center.

Approach: To this end we performed a retrospective analysis of kidney transplant waitlisted patients at our center between the years 2006-2014. The study sample consisted of 1,673 patients. KTMI scores were generated using comorbidity status at time of first evaluation and were compared using descriptive statistics. Main outcome measures included rates of transplantation, waitlist mortality, and removal from the waitlist (excluding removal due to transplantation at our center). The KTMI scoring scale can be found in Table 1.

Table 1: Kidney Transplant Morbidity Index (KTMI) scale

Comorbidity	KTMI Points
Age (years)	
18 – 49	0
50 – 64	1
≥ 65	2
Dialysis Dependency (years)	
0	0
0 – 4	1
> 4	2
Diabetes	
No	0
Yes	1
Coronary Artery Disease	
No	0
Yes	1
Cerebral Vascular Disease	
No	0
Yes	1
Peripheral Vascular Disease	
No	0
Yes	1
Body Mass Index (kg/m^2)	
≤ 35	0
> 35	1
Previous Transplant	
No	0
Yes	1
Functional Status	
No Assistance	0
Needs Assistance	1
KTMI Score	Point Total

Table 2: Characteristics of Study Sample

Characteristic	Value
No. of recipients	1673
KTMI, No. (%)	
0	146 (8.7)
1	347 (20.7)
2	451 (27.0)
3	431 (25.7)
4	187 (11.2)
5	75 (4.5)
≥6	36 (2.2)
Age groups, No (%)	
18-49 y	567 (33.9)
50-64 y	731 (43.7)
≥65 y	375 (22.4)
Body mass index, No. (%)	
18.5-34.9	1503 (89.8)
≥35	170 (10.2)
Functional Status, No (%)	
No assistance	1575 (94.1)
Needs Assistance, No (%)	98 (5.9)
Comorbid Condition, No (%)	
Cerebral vascular disease	122 (7.3)
Diabetes	754 (45.1)
Coronary artery disease	14 (1.0)
Peripheral vascular disease	138 (8.2)
Previous transplant	153 (9.1)
Dialysis Dependency, No (%)	
0 years	796 (47.7)
0-4 years	800 (47.8)
≥4 years	76 (4.5)

Findings: Baseline characteristics for the study population are shown on in Table 2. KTMI scores ranged from 0 to 7, with a median of 2 and a mean of 2.4. Figure 1. displays waitlist mortality and waitlist removal rates by KTMI score. A sequential increase is seen in both waitlist morality and removal from the waitlist as KTMI scores increase. Figure 2. displays transplantation rates of waitlisted patients by KTMI score. A sequential decrease in transplantation rate is seen as KTMI score increases from 0 to 5.

Figure 1. Kidney Transplant Waitlist Mortality and Removal Rates by KTMI Score

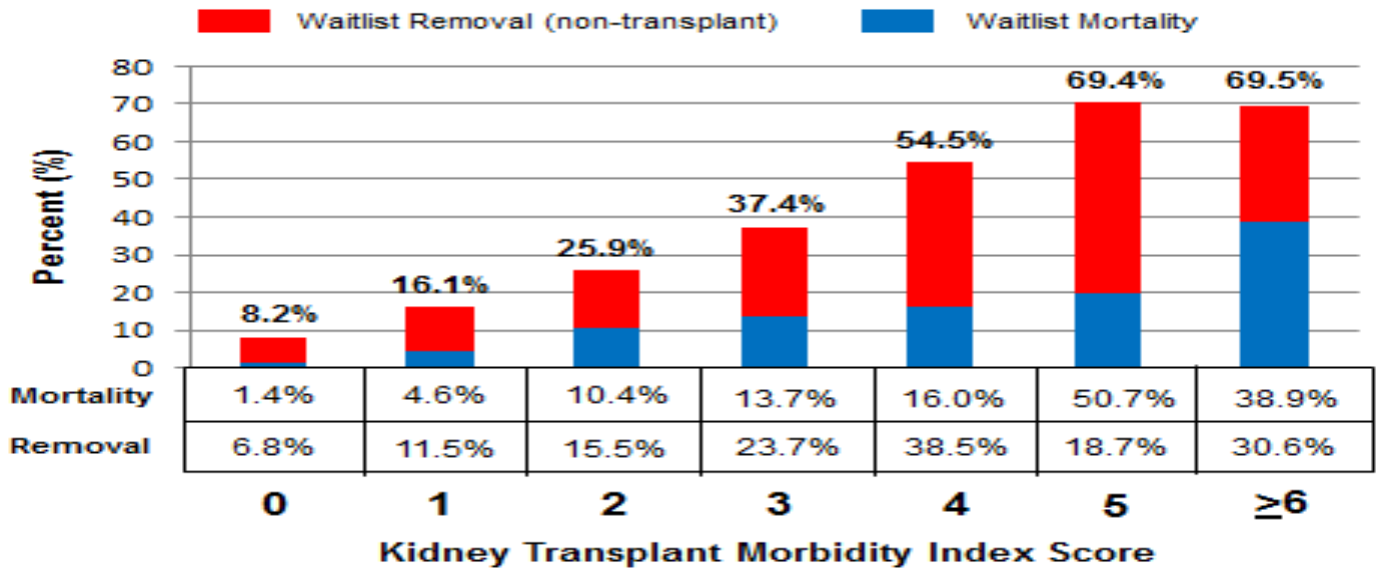
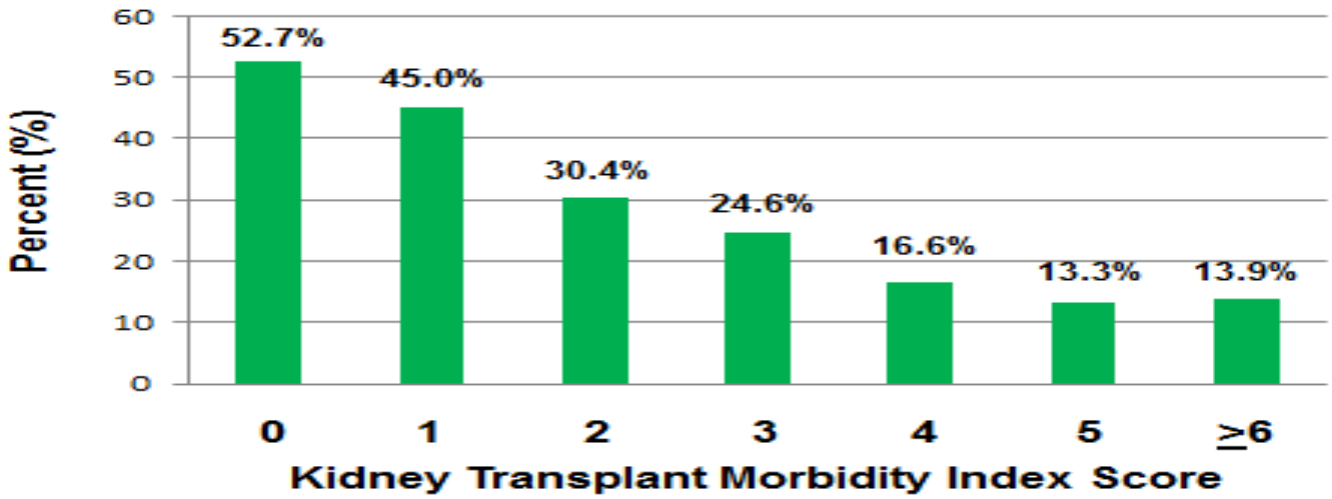


Figure 2. Kidney Transplantation Rates by KTMI Score for Waitlisted Patients



Implications: This analysis shows a strong correlation between the KTMI and waitlist outcomes, with waitlist mortality and removal rates sequentially increasing as KMTI scores increase with the inverse seen for transplantation rates as the KTMI score decreases sequentially. These findings help validate the KTMI to prognosticate waitlist outcomes for kidney transplant candidates using pre-transplant comorbidities at time of evaluation. Based on these results this simple tool may allow transplant programs to help improve productivity by better allocating and prioritizing resources to those waitlisted patients who are most and least likely to receive a transplant.

ABSTRACT C2-L

CULTIVATING RELATIONSHIPS BETWEEN TRANSPLANT PROGRAMS AND THEIR LOCAL OPO TO OPTIMIZE ORGAN UTILZATION AND IMPROVE LONG TERM OUTCOMES

Yvette M. Chapman, RN, BSN, CCTC, Southwest Transplant Alliance, Dallas, Texas

Problem/situation: For years, organ procurement organizations (OPOs) have spent countless hours and resources building relationships with donor hospitals in an effort to increase donor awareness and organ availability. As a result, donor referral rates and deceased organ donation have increased dramatically. Yet the need for organs still far exceeds the supply. Two OPOs hypothesized that giving focus to cultivating strong relationships with transplant centers can create an opportunity to understand transplant center needs, acceptance criteria and ultimately increases transplantation rates locally.

Methods/Practices/Interventions: Two OPOs implemented dedicated departments and personnel to serve as directors of relationship (DR) management with transplant programs in their designated donor service areas (DSA). The DR focuses primarily on developing effective and supportive relationships with Transplant Center leaders, analyzing and reporting center specific organ utilization and transplant data. Additionally, the DR is responsible for creating and implementing effective strategies to optimize organs for recovery and transplantation, while providing education and ensuring compliance with CMS, UNOS and ASTS requirements. The DR serves as the first point of contact for Transplant Center communications, complaints, and inquiries related to the transplant and allocation systems. The DRs actively foster an organizational culture that is based on collaboration, support, process improvement and constructive feedback; and provide input as needed into organizational policy development.

One process improvement strategy deployed by the two OPO DRs was to provide customized, program specific, organ offer and acceptance data analysis to help programs better understand acceptance practices and potentially increase organ utilization from local donors. The DRs worked with the business solutions division of the United Network for Organ Sharing (UNOS) to develop a tool to review distinct deceased organ offers. The DRs share center and program specific organ offer acceptance data and analysis with surgical and administrative leadership as well as collaboratively identify improvement opportunities, and support improvement initiatives.

Findings/Solutions/Conclusions: Upon full implementation of the DR role, our findings will be reported based on quantitative and qualitative analysis of assigned centers by using data analysis, examination of organizational hierarchy and needs assessment to develop effective improvement strategies for immediate results.

Implications/Relevance: The OPO DR manages relationships with transplant centers to maximize the shared mission of donation and transplantation. The DR provides ongoing support, consultation, and education to the transplant centers to ensure that all aspects of the donation process are understood, supported, practiced and implemented. Additionally, by evaluating outcomes data and acceptance rates with transplant we can collaborate to identify improvement opportunities and develop individualized improvement plans aimed at increasing transplantation.

The Organ Utilization Tool

Center Specific Data which includes the following elements for evaluation and analysis as provided by UNOS data

- Transplant Center acceptance rates by organ type
    - Ability to filter based on pre-determined donor characteristics and time
- Distinct deceased donor organ offers by organ type
    - Ability to filter
        - based on pre-determined donor characteristics and time
        - Decline code
- Evaluation of reported recipient outcome data of organs declined and transplanted elsewhere on a rolling 24-month period

Author List: Yvette M. Chapman, RN, BSN, CCTC; Meg Rogers, BSN, CPTC; Patti Niles, RN, BSN, CPTC

ABSTRACT C2-M

SURVIVING A LOSS-OR IS IT? TRANSITIONING FROM A DEDICATED TRANSPLANT DATABASE INTO AN ELECTRONIC HEALTH RECORD; ENSURING SEAMLESS, ACCURATE DATA FOR PATIENT MANAGEMENT, FQAPI, AND CMS/UNOS SITE SURVEYS

Debbie Mast, Financial and Database Manager, Stanford Health Care, Palo Alto, California

Situation: Year after year we were told we lived in a silo, with some patient information only available to us in our robust, stand-alone database. We had full control of the data entered, patient and team communications, and quality reporting. ABO documents were easily accessible and it was just the proverbial "us" that had access to our patients at a push of a button. Although manual manipulation of data was required, we had CMS reports at the ready, dashboards prepared for our quality councils and the ability to upload our Tiedi forms to UNET (data not available in the EHR), among other things. With the emergence of the Electronic Health Record (EHR), there came a bigger push to move our seamless world into the unknown. After all, how could we have up to date medication information for a patient but when they arrived in the emergency room, the staff there did not; and how could we have those outside labs, which interfaced with our database, when the hospital had to look for the scanned documents to find them? Our program managed to stall for a while but the inevitable time arrived where administration and top leadership made the decision to move forward. Panic set in and then we moved into action.

Approach: A project governance committee was formed in order to drive project requirements, scope, key decisions and issue resolution. The team consisted of leadership, managers, super users, IT, EHR IT team and program data manager. A project timeline (see Table 1) was executed to keep all involved in the process on track. Milestones were also determined for each phase of the project implementation (see Table 2).

Table 1

Table 2

Milestones:

- Planning
- Design
- Build
- Test
- Train
- Go-Live
- Stabilize
- Optimize

An important step in the initiation was to determine hours necessary for the project for all critical team members. (See Table 3)

Table 3

Project Role	Phase Total Hrs	Pre-Plan Nov	Plan Dec	Plan / Design Jan	Design Feb	Build Mar	Build Apr	Test May	Test Jun	Train Jul	Go-Live Aug	Sustain Sep
Transplant Team												
Executive Sponsor	154.00	12.00	12.00	18.00	8.00	8.00	8.00	8.00	8.00	18.00	18.00	18.00
Operational Lead	184.00	8.00	8.00	18.00	20.00	8.00	8.00	8.00	18.00	18.00	32.00	20.00
Quality Manager	166.00	8.00	8.00	18.00	20.00	8.00	8.00	8.00	18.00	18.00	32.00	20.00
Physician Champions (Abd)	180.00	12.00	18.00	18.00	20.00	8.00	8.00	8.00	18.00	18.00	32.00	20.00
Physician Champions (Thor)	210.00	12.00	18.00	18.00	32.00	8.00	8.00	8.00	18.00	18.00	32.00	20.00
Financial/Reporting SME	820.00	12.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00
Program Manager (Kidney)	202.00	8.00	12.00	18.00	12.00	18.00	12.00	8.00	12.00	32.00	32.00	20.00
SME (Kidney)	222.00	8.00	12.00	18.00	20.00	20.00	18.00	18.00	20.00	32.00	32.00	16.00
Physician SME/Champion	182.00	4.00	8.00	18.00	20.00	20.00	18.00	18.00	20.00	32.00	8.00	16.00
SME (Kidney)	214.00	8.00	12.00	18.00	20.00	20.00	18.00	18.00	20.00	32.00	32.00	16.00
SME (Kidney)	222.00	8.00	12.00	18.00	20.00	20.00	18.00	18.00	20.00	32.00	32.00	16.00
SME (Kidney)	214.00	8.00	12.00	18.00	20.00	20.00	18.00	18.00	20.00	32.00	32.00	16.00
Program Manager (Liver)	202.00	8.00	12.00	18.00	12.00	18.00	12.00	8.00	12.00	32.00	32.00	20.00
SME (Liver)	246.00	8.00	12.00	18.00	20.00	20.00	18.00	18.00	20.00	32.00	32.00	16.00
SME (Liver)	184.00	8.00	12.00	18.00	20.00	20.00	18.00	18.00	20.00	32.00	32.00	16.00
Physician SME (Liver)	184.00	8.00	12.00	18.00	20.00	20.00	18.00	18.00	20.00	32.00	36.00	16.00
HepC coordinator	184.00	8.00	12.00	18.00	20.00	20.00	18.00	18.00	20.00	32.00	36.00	16.00
Program Manager (Lung)	246.00	8.00	12.00	18.00	12.00	18.00	12.00	8.00	12.00	32.00	32.00	20.00
SME (Lung)	222.00	8.00	12.00	18.00	20.00	20.00	18.00	18.00	20.00	32.00	32.00	16.00
SME (Lung)	222.00	8.00	12.00	18.00	20.00	20.00	18.00	18.00	20.00	32.00	32.00	16.00
Program Manager (Heart)	202.00	8.00	12.00	18.00	12.00	18.00	12.00	8.00	12.00	32.00	32.00	20.00
SME (Heart) / SuperUser (Heart)	228.00	8.00	18.00	18.00	20.00	20.00	18.00	18.00	20.00	32.00	32.00	16.00
SME (Heart) / SuperUser (Heart)	210.00	8.00	12.00	18.00	20.00	20.00	18.00	8.00	18.00	32.00	32.00	16.00
Solid Organ Transplant Totals	5626.00	208.00	368.00	494.00	520.00	460.00	410.00	384.00	484.00	722.00	786.00	486.00

The data manager was assigned the bulk of hours due to data conversion, reporting, and data integrity. Positions were back-filled with staff so that adequate/quality time could be spent on the implementation. In addition to reviewing resources, the governance committee also had to look at the overall scope of the project, work flows and data conversion. Gathering and documenting business requirements with all members of transplant teams was crucial.

The data manager and IT group needed to document gaps from the database to the EHR, which included integration of outside lab data within the database that was not available within the EHR. Engaging the lab team, we had to work with IT, the transplant team, the EHR team and the outside labs to integrate labs as part of the go-live process, while also converting data from the database into the EHR as discrete values that could be reported on.

Each team had to document all current workflows and changes to work flows as the project moved forward. An important component for our teams was to include our Mechanical Circulatory System (MCS) patient population along with our Outreach patient population (the outreach clinics are not *only* transplant patients but also consist of general medicine patients that our team follows). Another imperative piece was the financial data. We were able to work the

transplant insurance screens from our database into the EHR, allowing discrete data tracking for Top 10 patients, expiring authorizations for transplant, transplant-specific insurance benefits, and tracking of coverage at time of transplant.

We developed training materials, including a manual of how to's. Tested work flows with staff, had weekly updates with teams, and had a monthly steering committee meeting with leadership.

Critical reports were developed before go-live so that our patient management, administrative dashboards, quality reports (see Table 4 and Graph 1), and CMS reports (see Table 5) were at the ready. Testing was completed along the way to ensure all data was correctly converted from the database and from UNET. Data from shadow charts, if not documented in the database, were manually entered.

Table 4

Quality Council (QC) Dashboard - Readmissions
Quality Council (QC) Dashboard - Returns to OR Post -Transplant
Quality Council (QC) Dashboard - Transplants and Rejections
Readmissions after Transplant Surgery
Transplant Length Of Stay (ICU)
Transplant Length Of Stay (ICU) - By Organ Classification
Transplants and Infections
Transplants and Readmissions

Graph 1

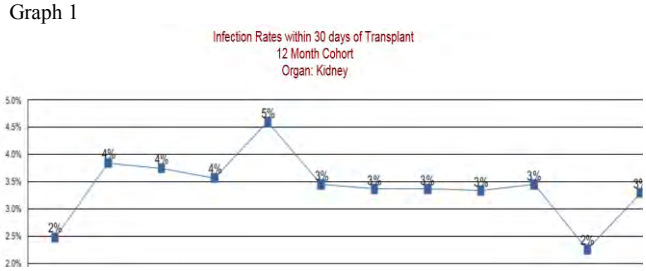


Table 5

Results: We have been able to develop and utilize an ABO tracking (see Table 6) including a pre-ABO tracking which is reviewed and discussed daily to ensure completeness and accuracy. Additional training is done as needed. Table 6

Date	Patient	ABO Timeout?	Surgeon?	Twice?	Anastomosis?	Anast >Verify?	Procedure canceled?	PT IN	Oper Start	Induction
07/08/2016		✓	✓	✓	✓	✓	No	1905	2237	1945
07/08/2016		✓	✓	✓	✓	✓		1351	1444	1400
07/12/2016		✓	✓	✓	✓	✓		1321	1541	1339
07/13/2016		✓	✓	✓	✓	✓	No	1300	1507	1316

Overall, data conversion, reports, forms, and letters was an enormous undertaking but something absolutely necessary for patient care and complete transplant documentation over many years of transplantation.

- Conversion: **1,000+** data elements/7million pieces of data
- **150-200** *reports* including real time clinical, dashboards, and regulatory UNOS/CMS reports for audits
- **14** UNOS *forms* will auto populate in the EHR when reporting data to UNOS
- **161** Physician /Patient *letters* will be automatically generated in and routed to HIMS for printing /mailing

Preparedness in the implementation of the data integration and knowledge of required reporting and workflow needs enabled each organ program to have a smooth transition at go-live. Transplant staff can easily access data collected across the entire continuum of care to inform their clinical decisions; shadow charts are no longer essential; data comparison is easily attainable through reporting; and, the transplant teams are ever-ready for site surveys.

Eliminated are:

- ✓ ***Duplicate documentation in two systems (including meds)***
- ✓ ***Limited data in the EHR***
- ✓ ***Missing outside lab values in the EHR***
- ✓ ***Multiple sources of data review***
- ✓ ***Shadow charts***

Conclusion: Utilizing the EHR for the transplant patient population has allowed complete access to the full patient medical record for hospital staff, providing the ability to meet patient needs and provide outstanding clinical care. There is no longer a disconnect between clinical data within two systems, and duplication of manual efforts has been eliminated. Our reporting is enhanced as there is no additional data manipulation required; CMS survey was successfully completed utilizing EHR CMS-specific reports, including the electronic ABO verification. Quality and administrative dashboards are readily available including graphical data views. Patient data allows for review and completion of Root Cause Analysis (RCA) as needed. All transplant programs with a hospital EHR can integrate their population of specialized patients within the EHR using the methods described. A dedicated team within the program, an IT team that understands transplant, and a supportive administration will ensure the needs of both the patient, team, and survey requirements are fully met.

Deborah A. Mast

ABSTRACT C2-N

Improvement of Liver Transplant Waitlist Attrition& Sustainability Achievement by Lean Principles

Zeynep Tulu, MS, MEMP, CSSBB, Quality Improvement and Compliance Manager, Stanford Health Care, Palo Alto, CA

Problem/situation:
In 2014, 181 patients were removed from the Center Liver Transplant waitlist. Of those patients removed, only 36% were removed for Liver Transplant. 67/181 (37%) of patients "died" or were "too sick" at the time of waitlist removal. *True north* is 100% of waitlisted patients receive Liver Transplant, and 0% die or become too sick for transplant. This project aimed to decrease the mortality/too sick removal rate from 37% to 25% by October 2016.

Approach:
Lean A3 methodology is used for problem solving. Initial data analysis showed that 33% (22/67) of these patients died despite having a low MELD score (low MELD score for this project is defined as <20). The project team scoped down and focused on patients who died/too sick on the list with low MELD scores (<20). Waitlist management, especially following inactives and low MELD patients, distance, access and primary care were identified as areas of opportunities. Causes of death were related to stroke, diabetes, frailty, hypertension, nutrition.

Findings/Solutions/Conclusions:
Access: Prior to this project, patients were seen in clinic by MD's. To increase access, the program has implemented a weekly Nurse Practitioner clinic.

Waitlist management: The transplant nurse coordinator (TNC) structure is redesigned, so that there will be dedicated staff for waitlist management.

Lean tools: visual management/ viz board and active daily management (ADM) are used for waitlist management and patient information update in the UNOS system. The program manager monitors MELD scores and expirations on the program viz board daily; the nurse coordinators update information for their own patients. During the project, prior to implementation of the interventions in November 2015, there were 121 patients who had expired MELD scores (program has ~500 patients on the list). The project goal is to have <50 patients with expired MELD scores. As a result of ADM, having information visible all times on the viz board and restructuring the coordinator's workload, currently, there are 40 patients who have expired MELD scores.

Distance/outreach clinics: Program has 8 outreach clinics; and the clinics had paper charts; therefore the handoff process from MD to TNC was broken. The MDs who would see the patients in outreach clinic would chart on paper, however that information was not easily accessible by the TNC, therefore the TNCs did not know what follow-up the patients needed. After identification of this problem, the project team worked with the outreach team who were able to include outreach clinics in the EMR. While at the beginning of this project there was no follow-up completed by the TNC (due to unavailable paper medical records), after the implementation of the EMR, the project team started auditing the MD clinic note and After Visit Summary (AVS) in EMR and TNC follow-up within a week. Initially, 50% of the patients had TNC

follow-up within a week completed, after education on the outreach clinics schedules and MD AVSs, the TNC follow-up rate within a week has increased to 92%.

Primary Care, Waitlist Management and Health Maintenance: A new institution: *Liver Transplant **Wellness** Program with an internal medicine physician serving as primary care physician if needed and focusing on* stroke, diabetes, frailty, hypertension and nutrition has been implemented since February 2016. The hospital internal medicine physician sees 4-5 patients/week. These patients are mostly patients who may not have primary care physicians locally, or those patients who are identified by the program as needing more focus and f/u for health maintenance.

The project team has chosen three process measures: expired MELD scores, timely TNC follow-up for outreach patients, and number of patients seen/clinic utilization in the Liver Transplant Wellness. In addition to program manager's monitoring of these measures in ADM; these process measures are also monitored by the Quality team and reported to the Quality Council monthly to ensure sustainability. Since November 2015, as a result of the implementation of the interventions above, the team has met the all process measure goals since April 2016 and continues to work on improving the outcome measure. As of August 18th, 2016, the mortality/ too sick removal rate has decreased from 37% to 26% (p-value <0.05) (see Figure1 below).

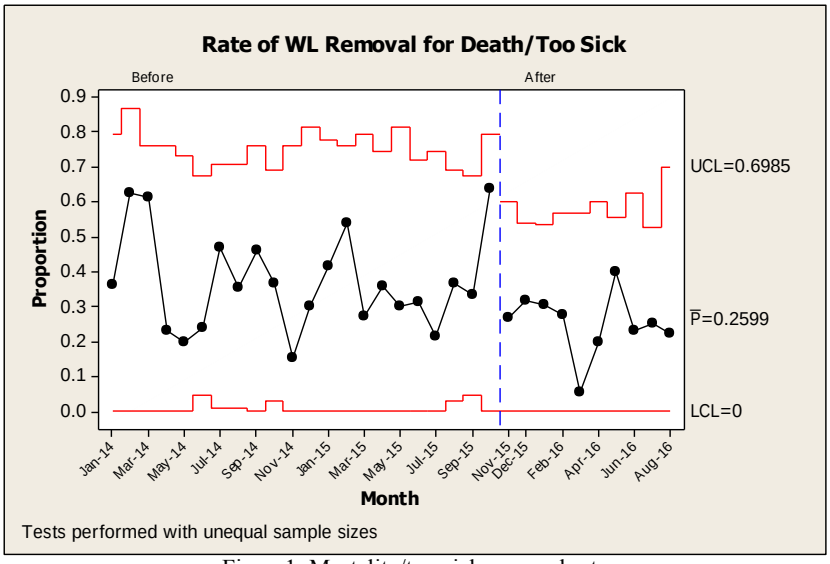


Figure1. Mortality/too sick removal rate

4. **Implications/Relevance/Learnings:**

The project has identified the need to provide same experience across outreach clinics, as all patients are listed in Center OPTN waitlist, and should be provided with the same care at the hospital and at the outreach clinics.

The project team and the program have benefited greatly from the use of ADM and Viz Walls. The TNCs and all staff can easily see the information, and are held accountable.

The project team identified that deaths for low MELD patients were not due to their liver disease rather were mostly related to primary care factors. This resulted in more emphasis on Health Maintenance, which is being provided through the new institution: *Liver Transplant **Wellness** Program.*

The project team and the program will continue to work towards achieving the True north.

Lupe Hogan, RN, Liver Transplant Program Manager, Zeynep Tulu, MS, Transplant Quality Manager, Antonia Maninang, RN, Liver Transplant Nurse Practitioner, Brendan Watkins, MBA, Operational Analytics Executive Director, Waldo Concepcion, MD, Liver Transplant Surgeon

ABSTRACT C2-O

A Multidisciplinary Approach to Increase Skin Surveillance in a High Volume Multi Organ Transplant Center

Michael James, BSN, RN, Tampa General Hospital, FL

Problem: Most literature on the subject of post-transplant skin cancers suggests that the risk of developing squamous cell carcinoma (SCC) is increased at least 100 fold when compared to the general population (Arron, Engels, Roberts, & Robbins, Skin Cancer Foundation Journal 2016). While the risks are well founded, there is little research devoted to transplant patient follow up with qualified dermatologists. Anecdotal evidence suggests that post-transplant follow up with dermatology runs the gamut from "dismal to fair" with the greatest successes coming from centers with access to staff dermatologists. The efficacy of transplant-focused dermatology clinics have shown that they can effectively increase awareness of transplant patient's skin cancer risk and improve their compliance with photoprotection. Overall, the literature suggests that few solid organ transplant patients recall receiving any counseling on their increased skin cancer risk. In fact, only 54% of patients remembered receiving education on skin cancer and less than 30% understood why sun precautions were necessary (Seukeran, DC, Newstead,CG, Cunliffe, WJ. Br J Dermatol 1998)

Approach: Beginning March of 2016 a quality initiative for scheduling for a post-transplant dermatology visit was implemented. A list of 54 kidney transplant patients was sent to the dermatology clinic for the task of contacting patients to schedule them; five of these patients were pediatric patients and not counted in this study. In collaboration with the institution's IT department a scheduling work queue was developed and operationalized on May 11, 2016. The utilization of the work queue expedited communication of the scheduling request to the dermatology department ensuring all post-kidney transplant patients were contacted immediately after discharge. Education provided to patients was modified to include statistical data regarding the increased risk of developing life threatening skin cancers, the value of early detection, and the importance of photoprotection. Patients were informed that they will be contacted by the dermatology department to arrange a convenient appointment that will coincide with their scheduled post-transplant clinic appointment; this eliminated some travel and time barriers that patients experience. Patients are also educated that post-transplant dermatology visits in the absence of any active issue is an annual visit.

Conclusion: Post-transplant **s**kin surveillance appointments increased from 9% to 39% post intervention with the discovery of 72 squamous cell carcinomas and 18 basal cell carcinomas. As a result of this successful initiative, other organ groups have adopted the post-transplant workflow.

Implications: The results of this quality initiative has increased skin surveillance in the post-transplant population. The findings suggest that some patients may have undiagnosed skin cancers in the pre-transplant phase suggesting more research is warranted in an attempt to capture this group before transplant. Research of the financial impact of early detection, treatment, and the feasibility of skin surveillance in the pre-transplant phase is underway.

Michael James, BSN, RN, Deborah Zuknick, BSN, RN, CCTC, Marge Asafu-Adjaye, BSN, RN, CCTC, Nishit Patel, MD, Lyndsey Bowman Anger, Pharm.D., BCPS, Nadine Hill, BSN, RN, CCTN

ABSTRACT C2-P

A QUALITY IMPROVEMENT EFFORT TO IMPROVE SCREENING FOR EPSTEIN-BARR VIRUS INFECTION IN PEDIATRIC SOLID ORGAN TRANSPLANT RECIPIENTS

Genna Kreher, MPH; Children's Hospital of Philadelphia, Philadelphia, PA

Problem/situation: Children receiving a solid organ transplant are at high risk for malignancy, especially post-transplant lymphoproliferative disorder (PTLD). PTLD is associated with Epstein-Barr virus (EBV) infection. Therefore, current adult transplant guidelines suggest screening for EBV with serial blood polymerase chain reaction (PCR) testing. Although there are no effective anti-viral medications for EBV, decreasing immunosuppression in patients with a positive blood EBV PCR, when feasible, may allow the host to control the infection and decrease the subsequent risk of PTLD. However, a lack of clear guidance on how frequently EBV PCR surveillance testing should be performed results in inconsistent EBV testing practices between and within transplant centers and organ groups. Using a formal quality improvement strategy, we standardized the screening for EBV infection among patients with a lung, liver, kidney, or heart transplant at our center.

Approach: The outcome measure was the percentage of children who received at least one EBV PCR blood test every 3 months for the first year after transplant. The process measure was the percentage of EBV PCR results with a text shortcut embedded in the electronic medical record (EMR) which detailed how providers responded to each EBV PCR result (i.e. continued screening, decreased immunosuppression, referred to oncology, etc.). The goal was to increase the percentage of children with a solid organ transplant who received at least one EBV PCR quantitative test every three months to 90% and to have the EMR text shortcut filled out for 90% of the PCR test results by December 2017.

Findings/Solutions/Conclusions: Collaboration between the four solid organ transplant groups (heart, kidney, liver, lung) was formalized with monthly meetings and education on the EBV screening algorithm (Figure 1). A QlikView (interactive data visualization tool) was developed to track the percentage of patients at each 3-month time period with at least one EBV PCR test (Figure 2). Baseline data (March 2016) revealed that 0% of patients had at least one EBV PCR test every 3 months for the first year after transplant. Baseline data (March 2016) showed that the EMR text shortcut was appropriately attached to 12% of the PCR results. As of December 2016, 43% of patients received at least 1 EBV PCR every 3 months within the first year post transplant. As of December 2016, the EMR text shortcut had been attached to 54% of PCR test results.

Implications/Relevance: We have implemented this quality improvement initiative with the multidisciplinary input of nephrology, gastroenterology, pulmonology, cardiology, infectious diseases, and oncology to optimize screening for EBV infection after transplant. Our ongoing monthly meeting includes review of the data, tests of change to improve adherence with testing, and case discussions of patients with persistently elevated EBV PCR results and of new PTLD cases. Once we achieve our goals of 90% of patients having regular EBV PCR screening and 90% of PCR tests having the EMR text shortcut attached, we will better understand how providers are responding to positive test results. Future quality improvement projects will incorporate how donor and recipient pre-transplant EBV serologies, organ type, and immunosuppression exposure affect the risk of positive EBV results and pathology-proven PTLD. Future research projects may examine the optimal frequency of PCR testing, PCR

thresholds (log copies/mL) associated with PTLD, and novel screening tests (additional biomarkers) and treatments (virus-specific T-cells) for this high-risk population.

Figure 1: EBV screening algorithm with EMR text shortcut breakdown for clinical use

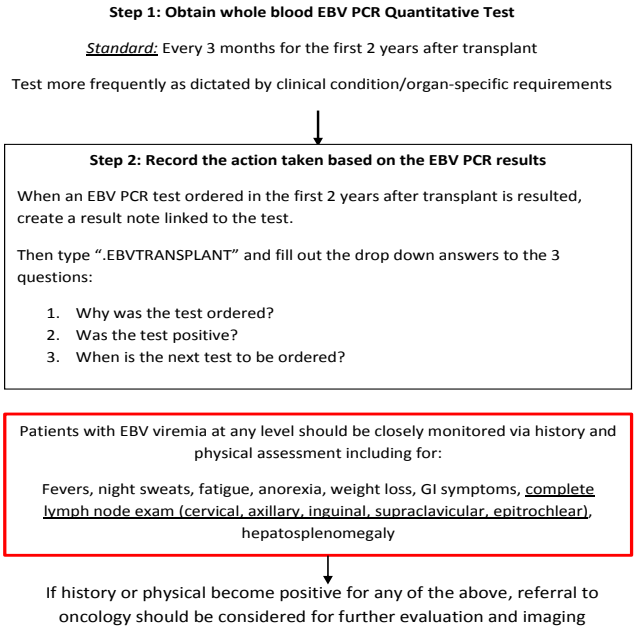
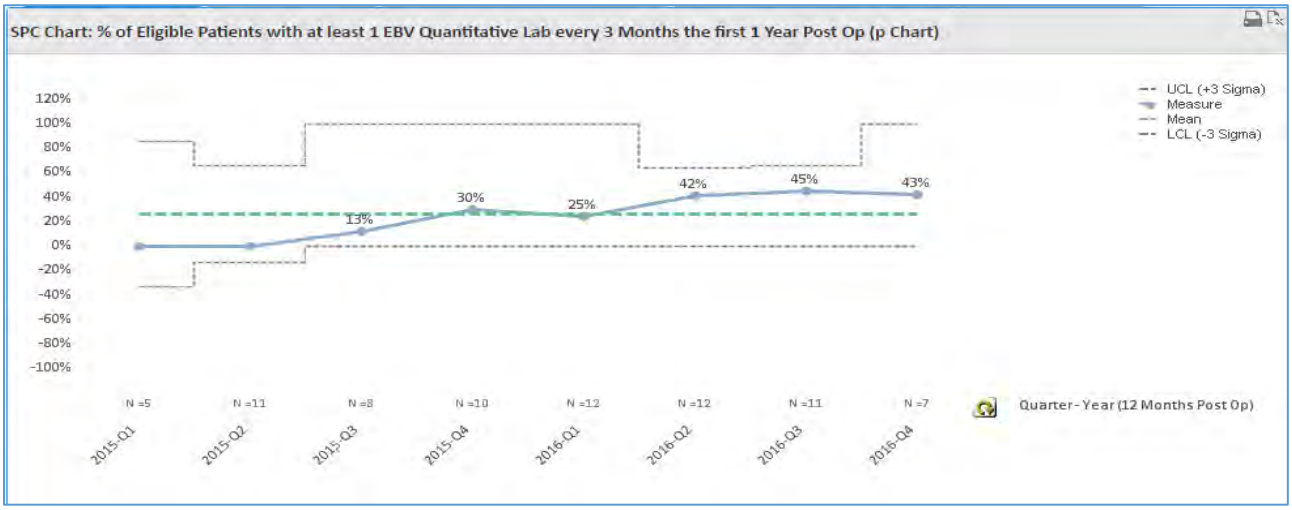


Figure 2: Statistical process control (SPC) chart in QlikView displaying the outcome metric of the percentage of patients with at least one EBV PCR every 3 months within the first year post-transplant. Each patient is eligible for testing at 3-month intervals from transplant. Thus the denominator (N) of total patients who are eligible to be tested at each time point varies (indicated at the bottom of figure 2).



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ABSTRACT C2-Q

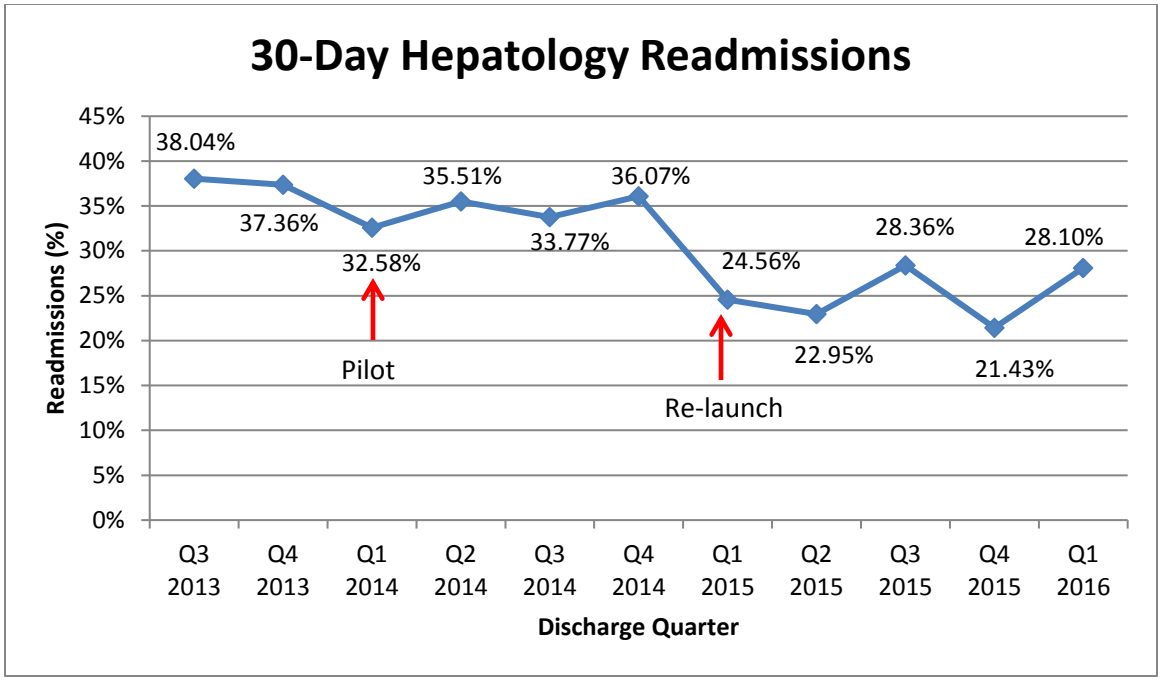
THE REDUCTION OF READMISSIONS AMONG HEPATOLOGY PATIENTS THROUGH CARE COORDINATION

Linda Wright, DrNP, RN, CNN, CCTC, Thomas Jefferson University Hospital, Philadelphia, Pa

Problem: The diagnosis of advanced liver disease is associated with many complications, such as hepatic encephalopathy, fluid overload, GI bleed, and electrolyte imbalances. The management of these patients is challenging for caregivers and providers alike as they require close monitoring and frequent hospitalizations. Hospital readmissions are not only reflective of patient outcomes, but also increase the risk of the development of new complications, such as hospital acquired infections, pressure ulcers, and overall physical decompensation. In addition, readmissions are a financial burden to the healthcare system, which impacts both patients and healthcare facilities.

Approach: In an effort to reduce cirrhosis related readmissions, a Care Coordination program was developed for the hepatology service at our center. Our facility is an inner city academic medical center, with a service which specializes in the care of patients with liver disease, including patients in need of a liver transplant. The Care Coordination program is managed collaboratively by attending hepatologists, a nurse practitioner, and an inpatient liver transplant nurse coordinator. Patients meeting certain criteria are enrolled in the program during their hospitalization. Inclusion criteria include frequent admissions due to cirrhosis related complications, poor social support, poor health literacy, and barriers to adherence with prescribed therapy. The nurse coordinator meets with the patient and his/her family to conduct an assessment and explain the goals of the program. The inpatient team works with case management to ensure effective discharge or transition of care to another setting. Patients are scheduled for a follow up visit with hepatology within 7-10 days post discharge. On discharge from the hospital, patients enrolled in Care Coordination receive frequent follow up phone calls from the nurse coordinator, to ensure adherence with the treatment plan and to intervene on clinical issues. Patients and their families are strongly encouraged to use the Care Coordination team as a resource to help manage the many symptoms related to their liver disease.

Findings: Our facility performed 66 orthotopic liver transplants in 2016, with the hepatology service admitting over forty patients monthly. The Care Coordination program was piloted in February 2014 and was re-launched in January 2015, after some modifications were made to the implementation process. Prior to the launch of the Care Coordination program, the readmission rate for hepatology ranged between 34-38%. The hepatology readmission rate has decreased to 22-29% since the implementation of the program. The Care Coordination program has resulted in decreased readmissions in patients with liver disease at our center. The causes of readmissions vary greatly, with some admissions being unavoidable. In the cases of preventable admissions, effective discharge planning, close monitoring, and continuity of care from the inpatient to the outpatient setting have been beneficial in preventing readmissions in our patient population.



Relevance: Patients with liver disease are frequently admitted to the hospital, due to the many complications associated with cirrhosis. These frequent admissions present a challenge for patients and providers, and represent a financial burden to our healthcare system. The Care Coordination program has resulted in a decrease in the readmission rates of high-risk hepatology patients at our center. This model can be modified to meet the needs of different patient populations.

Stephania Dottin RN, BSN, Linda Wright, DrNP, RN, CNN, CCTC

ABSTRACT C2-R

COMMUNICATION MANAGEMENT TO REFERRING PROVIDERS

Sophy Oung, RN, BSN, University of Kansas Health System, Kansas City, KS

Problem: The liver transplant program received complaints from referring physicians that communication was inadequate regarding their patients' progress towards liver transplantation. The liver transplant office had recently transitioned to a different electronic medical record system which contributed fundamental process failures in timely communication to referring providers. Upon analysis, the liver transplant team identified that there were 3000 visit and status update letters that had not been dispatched to referring providers properly.

Interventions: First, a collaborative multidisciplinary performance improvement team was formed to identify barriers to timely communication with referring providers. Barriers included:

- Providers not routinely signing off dictations at the end of the clinic day. Some providers would hold visit dictations until they had an "office day" which led to a large volume of letters being held in a pending status.
- The name and address of the proper referring provider was not always properly documented in the correct field in patients' electronic medical record (EMR).
- There were different work processes for letter management depending on the type of clinic and provider, even though the same office staff was working with all letters.
- The EMR system often had the wrong fax or contact numbers for referring providers' offices, which led to misdirected letters
- Office staff spent a large amount of time formatting letters to meet individual provider preferences.
- Provider dictations were often routed to the wrong person or office pool leading to further delay in completion of letters.
- Office staff also responsible for scheduling and phone communication, which lead to letters being handled as a lower priority task.

The performance improvement team met frequently over a six month period to identify, test, and implement solutions to each of the barriers above. Team members included the manager of liver transplant, the transplant clinic manager, office staff, informational technology staff, and providers.

Solutions: Analysis of workflow process and time management determined that the majority of delay in sending letters to referring providers was directly related to the lack in capturing the referring provider in the EMR. Staff was educated on the importance of this information in the workflow and was trained on a standardized process in documenting the referring provider in the EMR. The team performed random chart reviews after clinic visits, a team member would contact the referring provider to confirm that they received our letter using our new workflow.

The transplant providers agreed to be ultimately responsible for verifying that the correct referring provider was reflected in the EMR.

Other interventions included:

- Providers now responsible for timely dictation completion
- The team met with other ambulatory clinics to discuss their work process for letter communication
- Letter management workflow was simplified and condensed to be standardized across transplant clinics
- The standard letter templates were revised to implement provider preferences. Individual letter formatting according to provider is no longer allowed.
- The informational technology department analyzed letter routing and corrected errors
- Specific office staff was assigned to letter management as a priority responsibility
- Office staff was allowed overtime to get caught up on the back-log of letters.

Support staff and office members are now responsible for transplant clinic visit letters to referring providers. On average staff members are able to manage and process approximately 300 letters per week with a que sustained at goal level.

Implications: Transplant programs have a responsibility to provide timely updates to referring providers regarding a transplant patient. Referring providers should receive communication on a patient's waitlist status or post-transplant recovery and care for transplant recipients. This is a regulatory requirement, as well as a best customer care practice. Effective communication can improve collaboration between the referring provider and the transplant team ultimately improving the overall care delivered to the patient. This performance improvement project was established to correct a simple request to provide timely and accurate communication to referring providers. Prior to this project, we assumed that letters were sent to referring providers after clinic visits, and that referring providers were receiving this communication. After receiving feedback from several different providers, we decided to review our letter practices. Analysis determined that the cause was multifactorial including process, people, equipment and environmental components.

Sophy Oung, RN, BSN
Joanne Oxman, RN, BSN

ABSTRACT C2-S

TRANSPLANT THOROUGH REVIEWS: A SUCCESSFUL PROCESS DESIGN AND TOOL SET FOR ENGAGEING CLINICAL USE AND EFFECTIVELY MEETING REGULATORY REQUIREMENTS

Rebecca A. Stepan, JD(c), MPH, University of Minnesota Health, Minneapolis MN

PROBLEM/SITUATION

In 2014, the Transplant Conditions of Participation were updated to include Quality Assessment Performance Improvement (QAPI) elements. These federal requirements are described in the Centers for Medicare & Medicaid Services (CMS) Title 42: Public Health, § 482.96. Specifically, subsection (b) contains the adverse event review and policies. The transplant community faced several challenges with these additional requirements in an already highly regulated, rapidly-changing field with scarce resources.

In order to meet the new QAPI requirements, hospitals were tasked with designing a transplant thorough review process. Here, we show a successful design and tool set that can be replicated at other centers.

APPROACH

The strategy phase I included working with hospital quality and regulatory leadership to develop a transplant-specific Adverse Event (AE) Policy. This policy contained a protocol that clearly delineates when the hospital performs a required Root Cause Analysis (RCA) and when the transplant department performs a Transplant Thorough Review. The strategic plan part II was then developed to target: (1) identification; (2) monitoring; (3) analysis; and (4) prevention and sustainment of adverse events.

FNDINGS/SOLUTIONS/CONCLUSIONS

Identification

A timeline and planning series was designed with inpatient and outpatient adverse event regulatory and information technology (IT) staff for the purpose of adding a transplant flag to the currently-existing electronic programs at our center which report adverse events.

Monitoring

Training and development of reports from the electronic databases of the hospital were set up so that transplant quality and regulatory staff could monitor real-time reports of all adverse events.

Analysis

The Transplant Quality Professionals Listserv was leveraged to seek examples of transplant clinical review forms and tools from around the United States. Organ-specific clinical review forms were developed and customized for adult and pediatric liver, kidney, pancreas, heart and lung programs. The tools were converted into an Excel database so that the discrete data fields would be entered and analyzed for severity and additional trends in a pivot table each quarter.

Prevention and Sustainment

The clinical review form was further designed to incorporate the process elements from our hospital-based fishbone (Ishikawa) contributing factors criteria. A corrective action plan section was added for monitoring of actions taken when an issue was identified during the review. A thank-you email with a summary of the review is sent to participants and was the final critical design factor to ensure participants continue to attend and value the reviews.

IMPLICATIONS/RELEVANCE

To date, we have completed 46 transplant thorough reviews and are efficiently monitoring 32 corrective action plans. The program did not add staff for this work but rather focused on strategy and design. Annually, these data are aggregated and presented to Transplant Quality Steering Committee and the Hospital Lead Quality Committee, adding further value to the program and organization.

An efficient and sustainable design is critical to effectively meet the CMS § 482.96(b) Adverse Event requirements. Here, we show a timeline and tool set that can be replicated at transplant centers.

AUTHORS

Rebecca A. Stepan, JD(c), MPH and Michelle James, MS, RN, CNS, CCTN

ABSTRACT C2-T

TIME-IN-A-BOTTLE STUDY (TIAB II): MEDICATION ADHERENCE IN THOSE WAITING FOR A TRANSPLANT

Catherine M. Ashbaugh ACNS, BS, CCTC, Clinical Nurse Specialist, Transplant Department, University of Missouri Health Care, Columbia, Missouri

Purpose: Though poor medication adherence among adult kidney transplant patients is alarmingly high with distressing consequences, no one has systematically examined medication adherence in those waiting for a kidney transplant. Examining medication adherence in those waiting for a transplant may provide insight into possible interventions to improve this behavior before transplant so after transplant medication adherence is optimized. The purpose of this study is to examine the rate and correlates of medication adherence in those on the waiting list for transplant.

Methods: Using a descriptive, longitudinal design, 31 adults on the wait list for kidney transplant at two transplant programs in the Mid-west were followed for 4 months with electronic medication monitoring. One twice-daily administered medication was monitored using a medication event management system to simulate a twice-daily post-transplant immunosuppressant. Medication self-efficacy was measured using the Long-Term Medication Behavior Self-Efficacy Scale. Perceived health and health difficulty was measured using the Patient Health Survey. Social support was measured using the Social Support Appraisals Index. Perceived barriers to medication adherence was measured using the Medication Taking Barriers scale.

Results: Mean age was 51.94 years (range 25-69) with 68% male, 71% Caucasian, 35% with a high school education, 61% married, 45% disabled, and 65% utilizing a pillbox. The average number of medications was 11.03; average number of over-the-counter medications was 1.23; and 69% did not worry about paying for medication. Diabetes was the etiology of kidney disease in 45%. Medication adherence (percent doses taken on schedule) was 58%. Medication adherence was statistically significantly correlated with worry about paying for medications $r = -0.37880$ ($p = 0.0427$). Medication adherence was weakly correlated, though not significantly, with medication self-efficacy $r = 0.31966$ ($p=0.1278$), perceived health $r = 0.22798$ ($p=0.2174$), perceived health difficulty $r = 0.26543$ ($p=0.1640$), social support $r = -0.17853$ ($p=0.3366$), and perceived medication barriers $r = 0.17117$ ($p=0.3572$).

Conclusions: Nearly half of those on the wait list for kidney transplant are non-adherent with their twice daily administered medications. This is consistent with findings of medication non-adherence in other chronically ill populations. Many commonly targeted predictors of medication non-adherence were not significantly correlated. Patient worry about paying for medications may be an emerging predictor of medication non-adherence. Interventions are needed for those on the wait list to prepare them for immunosuppressive medication adherence after transplant. Traditional intervention approaches targeting motivation, intention, and self-efficacy have not proven effective.

Innovative interventions targeting novel behavior change approaches such as personal environmental systems, habits and routines should be explored.

Cynthia Russell,PhD, RN, FAAN, Mark Wakefield, MD, Leanne Peace, MSW, Ashley Deere,RN, BSN, An-Lin Cheng, PhD, Karen Hardinger, Pharm. D, Sherry Potts, RN, BSN, Liz Blakley, RN, BSN, Peggy McGinnis, LCSW, MSW, Marilee Clites, RN, BSN, Daniel Murillo, MD

ABSTRACT C2-U

"IT'S NOT TOYOTA, IT'S TRANSPLANT! CAN LEAN TRANSFORMATION REALLY WORK IN TRANSPLANT?"

Darren Flynn, MBA, PMP, LSSMBB, UNC Center for Transplant Care, Chapel Hill, NC

Problem:

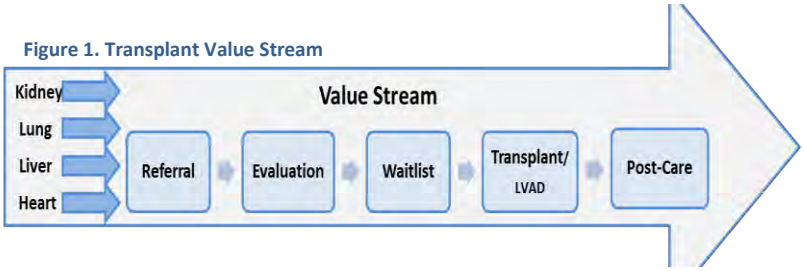
In 2006, we launched our mandated data-driven Transplant Quality Assurance & Performance Improvement (TQAPI) program in preparation for the 2007 CMS Transplant Conditions of Participation. A decade later, our TQAPI program has matured beyond meeting the basic regulatory requirements. Each organ group has a successful Local Quality Council who has developed a strong TQAPI program using Lean Six Sigma methodology. We had very high praise in our FQAPI survey this year. However, we still had unmet business process needs and despite staff expansion, there was growing concern about caseloads and care demands for staff and providers alike. Our transplant teams work hard every day, caring for critically ill patients. We perform life–saving work under constantly changing environments, with intense regulatory and financial pressures and demands. For all our efforts, we want to know that our work is meaningful and effective. We want proof that we are making a difference for our patients, our business, and for our people. We've had great success using Lean methodology, so we turned to Lean to help us reach the next level – to cultivate Lean culture and thinking throughout our business. We embarked on a lengthy journey to transform our transplant center, our culture, and the way we manage our daily processes. We adopted a philosophy called Lean Transformation (LT) to meet this lofty goal.

Lean Transformation is a comprehensive approach to process improvement that reaches beyond the traditional scope of a single process improvement project; LT supports a culture of quality embedded into daily activities. Lean Transformation offered us a structured roadmap, letting us continue to build on a strong Clinical QAPI foundation, while adopting a wider quality lens for daily business practice to include other institutional pillars, i.e., People, Growth, Value, & Innovation.
Top manufacturing companies, like Toyota, have successfully embedded Lean into their daily work and culture. But Toyota is not healthcare, and it certainly isn't transplant! Could LT work in such a complex, busy, regulated environment like transplant? Based on our previous success with Lean to date, we strongly believed that it could.

Methods:
Building on the basic tenets of Lean (efficiency, removing waste, and respect for people) we embarked on a 12-18 month journey to examine the value we create for ALL of our customers (e.g. patients, providers, staff, and third party entities). We've spent the last six months in preparation. With guidance and support from the hospital Operational Efficiency team, Transplant QAPI Leadership (Director, Managers, and Quality Leaders) explored the concept of LT, and how it could apply to daily transplant processes and began to map our transformation journey.

- **Commit to the process** – Transplant is always busy. We had a lot on our plates already, e.g., a major Electronic Health Record (EHR) implementation, preparing for FQAPI, and CMS re-certification survey. Could we take on and sustain a project of this magnitude? Time constraints around known events were identified, with tentative time frames for our LT Value Stream Analysis (VSA) event (a full week of off-site work). Operational Efficiency provided the necessary guidance and support, including planning events for this 12-18 month journey.
- **Define your "True North"** – We considered our mission statement, vision, and values to define our "True North". "Deliver comprehensive life-enhancing care for patients with end-stage organ disease, in a manner that results in the best possible outcomes for patients and their caregivers, efficiency for our physicians, surgeons and 3rd party entities, and respect for our employees."
- **Identify the Value Stream** – The value stream is the set of activities or processes that deliver a product to our patients. Which of these activities deliver the most value to our patients? We defined our value stream as a set of high level steps/phases that were common to each program. See Figure 1.

Figure 1. Transplant Value Stream



- **Create the project charter** – Define the Problem Statement and the Reason for Action – Lack of process alignment from team to team introduced variability in referrals and volumes; process times; decreased throughput, and not fully leveraging the new EHR. There was a clear lack of standard work across organ groups. Our Reason for Action was clear; we needed to learn to work smarter, we were already working harder!
- **Set the scope** – In 10 years of QAPI, we had studied lots of individual processes, e.g., referral to waitlist, post-transplant length-of-stay, readmissions, etc. Lean Transformation requires a higher level view. Our scope is: Start: Referral Receipt, Stop: Transplant surgery or /LVAD implant. We plan to address Transplant to post-care in LT Phase 2.
- **Project planning** – The VSA event will lead to an assessment of the processes we use to deliver value to our patients using our True North as our navigator. The process improvement projects identified will be the most important to successful transformation. A data collection plan was developed to measure our current baseline. (see Table 1)

Table 1. Transformation Metrics and Data Collection Plan

Resilience	Informed of Delay	Time to Selection	ETDBW	Referral to Appointment	Called for TXP/Not ready	Cancellations/no shows	TXp Rate	referral to WL conversion
People	Quality	Quality and Service	Q	Q	Q	Q	G/V	I
To Measure staff burnout/overburden	Assess service in the clinic	Measure the time from Referral recvd to presention?	Call response	Referral recvd to Appointment	Measure defects when txp patients are not ready	Assess the reasons for appointment waste/delay	Determine the txp rate	Assess the conversion of referrals to Wlable patients
			survey referring providers	define for each organ group	Use root report			% of referrals that we are able convert
Organ, Role,Years with Txp,FT v. PT, Temp vs Perm	All visits	Organ, comorbidities, IP vs OP, Peds vs. Adult, Instype, Second txp?, ESTEP, on hold		Organ, IP/OP, Peds vs Adult, referral provider, Ins type	Organ, SE stat, ins, comorbidity	physician, organ, specialty, Season		organ
survey	PG survey	BO		BO	Coordinators for detail	BO	6 month reports	BO
Random sample	Current PG process	All		All	All	All	All	All
discrete	continuous	continuous		continuous	discrete	discrete	continuous	continuous
bar chart	line chart	line chart		line chart	bar chart	bar chart	bar chart	bar chart
Quality team	Clinic Manager	Quality team		Quality team	Coordinator	Quality	Quality	Quality
August - TBD	ASAP - TBD	3/14/16 to present		3/14/16 to present	3/14/16 to present	Apr-14	2014-present	2014-present
Quarterly	monthly	Monthly		monthly	monthly	monthly	6 month	6 month
60.50%	81%	224h,354k,396lu,382li	TBD-9/12/2016	29 days	TBD-9/12/2016	50 per month	SRTR-tables	TBD-9/12/2016
TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

- **Prepare for the change** – Nemawashi is "the informal process of quietly laying the foundation for a proposed change or project by talking to the people concerned, gathering support, and feedback, etc." Literally translated, it means "going around the roots" to prepare the plant for change. A critical element that must be done before any formal change process begins; we purposefully sowed seeds of transformation for a year before we were ready to launch. We held a QAPI retreat in July 2015 to plan; since then, LT concepts and expected values have been discussed at TQAPI meetings, Directors meetings, Staff meetings, Division meetings, and Transplant Operations meetings. Our Nemawashi has successfully created buy-in across all organ groups, staff, and physicians alike.
- **Form the Teams** – Key participants from all organ groups have committed to participate in the week-long VSA event. We created the Lean Transformation Leadership Team and identified our currently existing Solid Organ Transplant Operations group as a Steering Committee. We have physicians who want to participate as well!
- **Hold the event** – The VSA event is scheduled for September 2016. We will have collected all pre-transformation baseline data and we will have collected our Voice of Customer. We will map out the current value stream, go to the GEMBA (where the work is done), and identify process gaps and plan the projects to reach our future state. Over the next year, we will implement projects to meet our goals.

Conclusions/Implications

We set our sights high, and we have a long way to go, but to date we have met our goals for planning and implementing the initial phases of the transformation. We are prepared for the VSA event. So, can LT work in Transplant? We enthusiastically think so, but it is an advanced philosophy, it's not for the inexperienced TQAPI program, or the non-committed. Based on experience to date, we believe that LT will be the right path to get us to the next level of quality and it can work for other transplant centers. Our outcomes will be more evident in the coming months as projects are implemented for the transformation measures. As we move through our transformation we will journal our progress, compile lessons learned, and measure our results to share with other Transplant Centers who are thinking about possible next steps for their TQAPI program.

Darren Flynn, MBA PMP, LSSMBB; Alessandra Sanatian, MBA; Lauren Kearns, MSN, RN-BC; Randy Watkins, LSSBB

ABSTRACT C2-V

EARLY IDENTIFICATION OF PSYCHOSOCIAL CONCERNS IN LIVER TRANSPLANT CANDIDATES STREAMLINES THE PATH TO LISTING

Lindsay R. Smith, RN, MSN, Vanderbilt Transplant Center, Nashville, TN

Purpose: Psychosocial factors, including lack of a support person and sobriety, can lengthen a liver transplant candidate's referral to listing time. In 2014, 61 liver transplant candidates were placed into a deferred status pending resolution of psychosocial issues. At this time, the liver candidates who were deferred for psychosocial concerns had a median time from selection committee to listing of 57 days, and a median time to decline of 175 days. These long deferral times often stemmed from a late discovery of a psychosocial concern during the evaluation phase that required the patient to take additional steps in order to become an appropriate liver transplant candidate. We identified an opportunity for improvement.

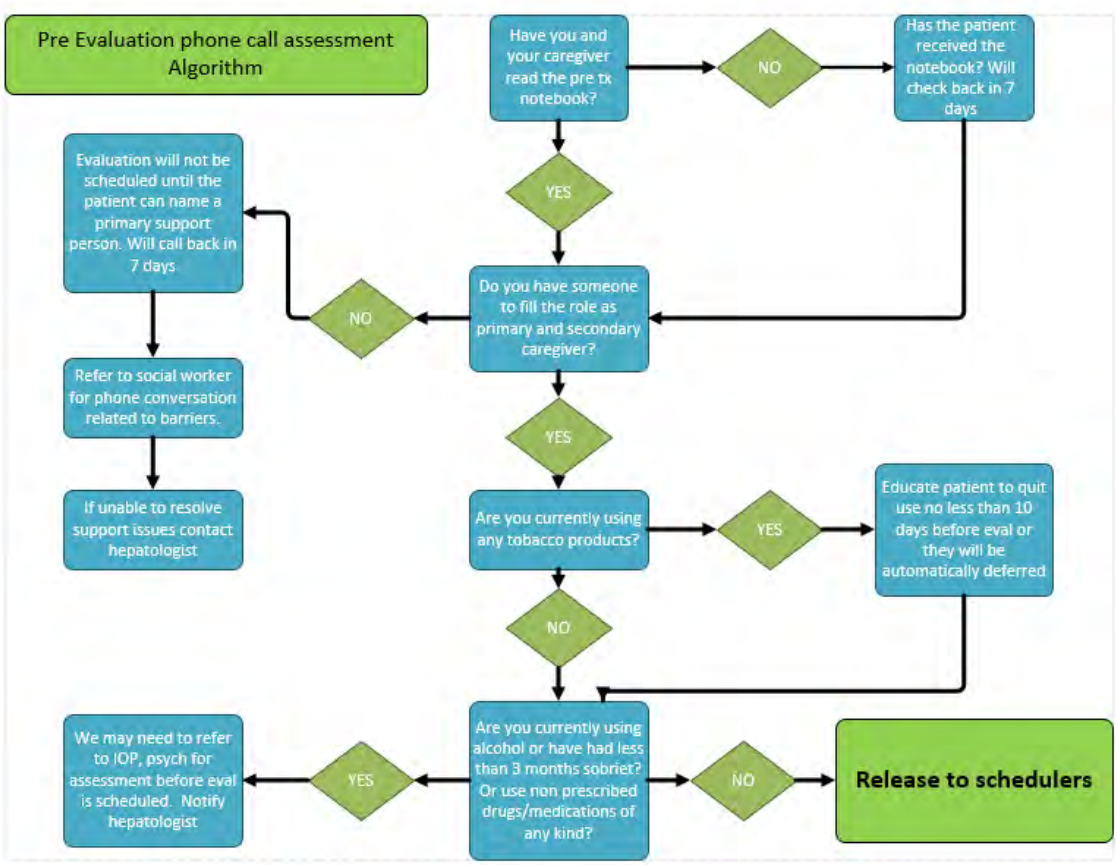
Method: A process improvement project team was created to improve the early recognition of candidates with psychosocial concerns and direct them to appropriate resources in order to be appropriate candidates at time of selection committee. The project team consisted of liver transplant physicians, coordinators, social workers, and psychiatry. The project team created a pre-screening algorithm to be used at time of referral to help identify candidates with psychosocial concerns (See Figure 1). This telephone tool screens for the following psychosocial concerns: 1) do they have a primary caregiver; 2) are they currently using alcohol or have they had less than three months of sobriety; and 3) are they using any non-prescribed drugs or medications of any kind? When a psychosocial concern is identified, the patient is connected with the resources that they need; i.e., intensive outpatient program (IOP) referral and/or social work referral. The screening tool has hard and soft stops built in to ensure that patients meet liver selection criteria prior to being scheduled for evaluation.

Results: The pre-screening tool was implemented at the start of 2016 and has been utilized for over 252 referrals. Of these patients, 89 were listed, 28 were declined, and 74 were placed as deferred after initial presentation at selection committee. These deferred patients had a decreased median wait time to listing of 35 days, and 28 days to decline (See Graph 1). The tool has also aided in screening out individuals who are not ready to start the evaluation process due to medical suitability, insurance coverage, or psychosocial reasons.

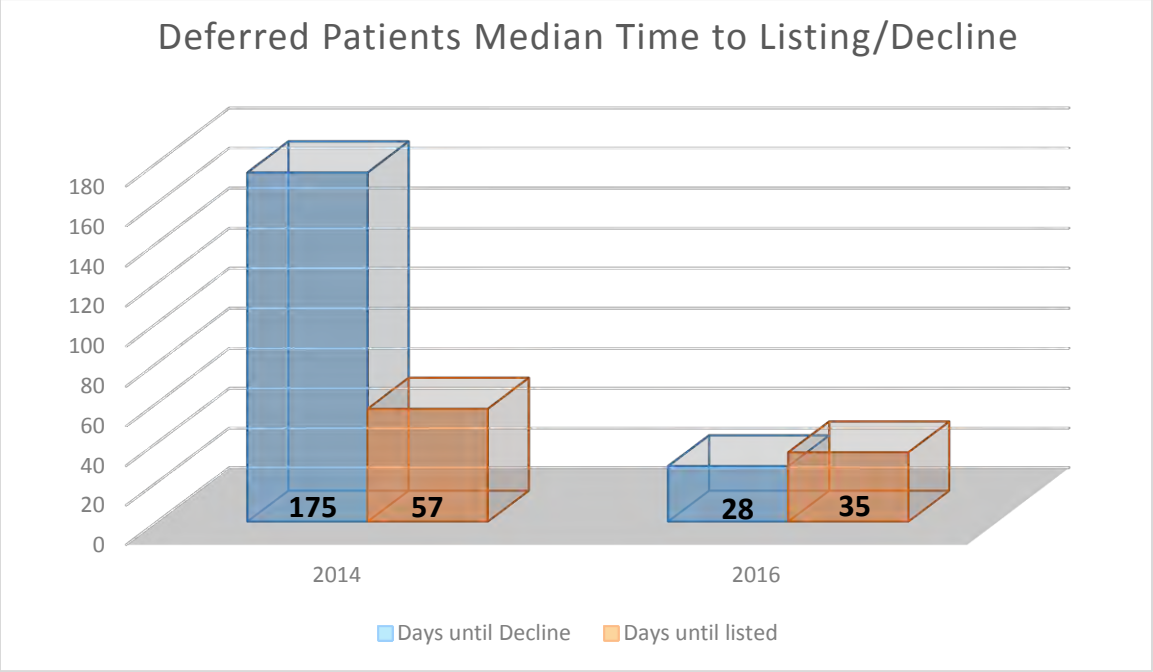
Conclusion: After the implementation of the prescreening tool, the liver transplant program's listings increased by an additional 39 listings for calendar year 2016, a 22% increase. These additional listings can be attributed to streamlining the process of referral to selection committee. By identifying psychosocial risk factors at time of referral, those patients are able to be connected with resources earlier to help them be an appropriate liver transplant candidate.

Lindsay R. Smith, RN, MSN; Kim Bone, RN; Callie Darragh, NP; Chan Chung, MD; Anthony Dreher, MPA; Christianna Gamble, Sunil Geevarghese, MD, MSCI; Stacy Lytle; Lesley Omary, MD; Anne Schmitt, LCSW; Natasha Schneider, MD; Karen Starr, MSN, APRN-BC, LADAC

Figure 1:



Graph 1



ABSTRACT C2-W

DECREASING THE "ADVERSITY" OF OUR PATIENT SAFETY EVENT PROCESS

Lori L. Ewoldt, M.A. RN, William J. von Liebig Center for Transplantation and Clinical Regeneration, Mayo Clinic, Rochester, Minnesota

Problem: A 2014 Focused QAPI visit identified several deficiencies in our patient safety event management practices. Our existing process involved significant manual effort and it did not allow us to consistently identify events that occurred in the ambulatory setting or in support areas outside of the patient's assigned hospital unit. An additional challenge was the lack of a consistent "thorough analysis" in our review of events.

Methods/Practices/Interventions:
Our institution uses a vended self-reporting tool for patient event reporting. The transplant center was unable to identify transplant specific patient safety events as the reporting system captured incidents based on the geographic area where the incident occurred. Using the vendor's reports was labor intensive since transplant patients had to be manually abstracted from the other patients intermingled within the various care areas. In addition, lack of access to patient safety event data from support areas like radiology and infusion therapy meant that the list of transplant events was likely incomplete.

With no available benchmarks, the transplant team collaborated with nursing and quality office colleagues to develop a mandatory data field that was added to the event reporting tool. The new data field required the identification of all transplant patients at the time of event reporting.

We then requested that transplant event reports be formatted so we could decrease our manual reporting burden by leveraging the tools inherent in electronic spreadsheet programs. A single table of all transplant event information was developed to organize the data in a format suitable to initiate improvement. This enabled enhanced reporting; the data could be segmented and compiled into types of events, volumes and severity based on level of harm, and focus on highest volume and impact areas. All involved disciplines were given access to this table and trained on how to use the tool in order to obtain the most meaningful data for their particular purpose.

Findings / Solutions / Conclusions:
The transplant center is now able to segregate and look at information in depth by program as well as across multiple programs. There is flexibility to address an individual patient event or trend data by program for similar events across the center. The table of event data is refreshed monthly, including the dissemination of program specific reports.

The first half of 2015 was used to establish a baseline and create a standard process to disseminate and analyze the data. High impact and priority areas of focus were identified using Pareto analysis. For example, transplant nursing and pharmacy now meet on a quarterly basis to address medication

errors. Data allows the team to conduct root cause analysis objectively and form multi-disciplinary partnerships to address issues. Real time notification of incidents, based on level of harm, has increased engagement among providers and multidisciplinary teams. Thorough analysis of events is coordinated by the transplant center in conjunction with other disciplines based on the specific event.

Implications / Relevance:

Patient Safety Event reporting and analysis is part of the CMS Transplant Conditions of Participation. Establishing an efficient and meaningful event management system is an action item for all transplant programs. We achieved our goal of creating a standard methodology by which transplant related patient safety events could be identified, tracked, trended, and thoroughly analyzed. We were able to create a comprehensive baseline where none existed. The system has the flexibility to report and analyze event data at a specific program level and in aggregate across all programs in our center. Data staff are pleased that the new process has significantly decreased the manual effort previously required in event reporting and analysis.

This is a constantly evolving process. Traction has been gained through lessons learned and consistent visibility of this topic at all levels of the transplant center. This process improvement has strengthened the culture of safety within our transplant center. We were also pleased that the new process received positive feedback during a 2016 CMS site visit to our transplant center.

Lori L. Ewoldt, MA, BAN
Savitha Iyengar, M.S.

CATEGORY 3:

Revenue management/optimizing profitability

ABSTRACT C3-A

LUNG TRANSPLANT PROJECTED COMMERCIAL CLAIM COSTS FOR 2016 IN THE UNITED STATES

Stephen George, PharmD, MS, Milliman, Tampa, FL

For abstract, please contact Stephen George.

ABSTRACT C3-B

EARLY IMPACT OF LUNG RE-PERFUSION ON HOSPITAL FINANCES

Stephan J. Moore, MHA, FACHE, CMPE, UF Health Shands Hospital, Gainesville, FL

Purpose: With the number of end-stage lung disease patients listed for lung transplantation in the U.S. exceeding the available supply of cadaveric donor lungs, strategies to increase utilization of previously discarded organs are being pursued; two of which are donation after cardiac death and the use of lung re-perfusion technologies. Even under an FDA trial, hospitals will generally incur increased capital and supply/testing/staff costs associated with lung re-perfusion. Transplant Administrators will be concerned that the contribution margins of their program's lung transplant procedures will suffer with the addition of incremental costs. This concern is magnified in the current accountable care era where payers are increasingly looking for not only better-than-expected SRTR outcomes but programs that offer increased value to their covered lives (with less outlier protection on catastrophic cases and less willingness to raise case rates by Centers of Excellence payers).

Method: The program administrator utilized the hospital's data warehouse to analyze the lung transplants performed by the program since the first re-perfusion procedure was performed in early 2016. The data was extracted with the following variables:

- Patient Name (with and without re-perfusion applied to the donor lung(s))
- Admit Date of the inpatient transplant case
- Lung Allocation Score (LAS) at transplant (from UNET)
- Match sequence (from UNET)
- Transplant date
- Discharge date
- Charges/Direct Variable Costs/Direct Fixed Costs/Indirect Variable Costs/Indirect Fixed Costs/Net Collections/Length of Stay/ICU days/APR Risk of Mortality/APR Severity of Illness

Results: The analyses (utilizing data sorts based on re-perfusion/non-re-perfusion and blood group) yielded the followings summary findings:

- Of 21 total lung transplants, 4 (19%) were performed utilizing the re-perfusion technology prior to implant into the recipient
- Of the 4 re-perfusion cases 75% were blood group O, with 25% being blood group A
- Of the non-re-perfusion cases 41% were blood group A and 59% were blood group O
- Of the A blood group transplants all patients were called in from home at transplant
- Of the O blood group transplants 5 of 13 patients (38.5%) were waiting as hospital inpatients for transplants.

- Of the 5 O blood group transplants that were inpatient at the time of the organ offer, 40% received re-perfused lungs.

Summary Data and Financials were as follows (Mean/Median):

Group	LAS at TX	UNET sequence of offer	Transplant Inpatient Length of Stay	ICU length of Stay during Transplant Admission	Contribution Margin – Total for Group	APR Severity of Illness
Transplants with re-perfusion	33.82/32.88	15.25/11	17.75/18	5.50/6	-$20,427	3.75
A patients without re-perfusion	35.20/36.67	11.29/10	25.14/18	14.86/7	-$138,220	3.86
O patients without re-perfusion	52.31/42.25	6.30/2	32.40/27	14.50/7	-$717,839	3.67

Conclusions: While the sample size of this analysis is limited and will continue to be expanded as more lung re-perfusions occur, some early observations are worth noting.

- The lower median and mean LAS scores at transplant (especially in the blood group O population) in the re-perfusion group indicates the option of re-perfusion technology may allow the transplant surgeon and team to have more selection of lungs for O recipients which may allow some patients to transplant at a lower LAS before they become more ill and may then end up receiving lungs only when admitted to the inpatient (and more costly) setting.
- The higher average and mean UNET offer sequence further supports the ability of the surgeon and team to consider more lungs for recipients that other centers may determine are marginal without access to re-perfusion technology.
- The ability to better time transplant at a lower LAS score, especially for blood group O patients leads to a lower median and mean inpatient overall and ICU LOS and generates a better contribution margin for the re-perfusion group.
- The APR Severity of Illness indicates that the coded patient severity was not different on admission for the transplant event.

Stephan J. Moore, MHA, FACHE, CMPE

ABSTRACT C3-C

A KIDNEY PAIRED DONATION STANDARD ACQUISITION CHARGE PILOT PROGRAM

Betty C Crandall, MS, RN, Wake Forest Baptist Health, Winston-Salem, NC

Problem/Situation: A non-profit kidney paired donation (KPD) organization undertook a demonstration project to redesign reimbursement for the costs associated with KPD transplants utilizing a payment model similar to that used for deceased donor transplants – a standard acquisition charge (SAC). A 2012 Consensus Conference on KPD concluded that establishment of a national KPD SAC would alleviate administrative and financial challenges that currently limit transplant center participation when KPD involves more than one transplant center.

Approach: Over a number of months, stakeholders agreed on what costs should be reimbursed. Notably, the group decided on the appropriate tests included in the donor evaluations. Further, they compiled de-identified data on the current costs for living donor kidney recovery (facility fees and professional fees of the surgeon and anesthesiologist) as well as the costs for preservation, packaging and shipping of a living donor kidney. The de-identified data included the Medicare reimbursement rate for the services in each geographic area plus the average commercial insurance reimbursement calculated from three commercial payers of their choosing. The study experienced a slow start, as it was necessary not only to achieve consensus, but for the Centers for Medicare and Medicaid Services (CMS) to grant the awardee permission to move forward, given the project had direct implications for a transplant center's Medicare Cost Report. Approval was given in June 2014, and transplant centers formalized their participation via a written agreement.

Findings/Conclusions: The initial study was designed to provide reimbursement to transplant centers only for donor evaluations related to KPD; but it became obvious that in order to attract more centers to participate (thus broadening access for patients desiring KPD), expanding reimbursement to pay centers for KPD donor nephrectomy was highly desired. The project evolved to include payment to KPD donor hospitals for the cost of donor evaluations, facility and professional costs for nephrectomy, and preservation, packaging and shipping the donated kidney. In return, the KPD transplant center receiving the donated kidney agreed to pay a KPD SAC to the non-profit organization facilitating the exchange following transplantation of said kidney. To date, 72 transplants have been performed using the KPD SAC mechanism since its initiation in 2015 and 40 transplant centers have signed cooperative agreements to participate in the project.

Implications/Relevance: This Agency for Healthcare Research and Quality (AHRQ)-funded project has provided a mechanism to reduce the administrative burden of negotiating payment and legal agreements between providers for the costs associated with kidney paired donation. It has also provided cost certainty for transplant centers

and payers. In so doing, greater transplant center participation in KPD has been achieved, leading to additional living donor kidney transplants in the United States.

Acknowledgements:

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CATEGORY 4:

Transplant center initiatives to increase organ donation

ABSTRACT C4-A

LIVING DONOR TRAVEL PROGRAM APPLICATIONS VERSUS SCIENTIFIC REGISTRY OF TRANSPLANT RECIPIENTS: DONOR COUNT PER CENTER

Patricia Holly Warren, RN, American Society of Transplant Surgeons, Arlington, VA

Purpose: Most living organ donors face direct costs when donating an organ. Those costs are; transportation, lodging, meals, and lost wages. In 2006, a national program was established to remove some of the financial disincentives to living organ donation. Program eligibility is means tested by measuring the household income of the recipient of the organ. This HRSA funded program allocates $2M yearly for donor travel expenses. One of the goals of the program is to ensure all eligible donors know about the program and have equal access to the funding. To better understand transplant center usage of the program a two-year retrospective study was completed.

Method: The counts of submitted applications during 07/01/2014-06/30/2016 for 194 transplant programs were obtained from the program database. The counts of living kidney donations for those 194 programs during 07/01/2013-06/30/2015 were calculated from Scientific Registry of Transplant Recipients (SRTR) December 2015 report. The counts of program application were compared with the counts of living donation and Pearson correlation was calculated.

Results: The counts of program applications range from 0 to 111 (median=9.7, mean=4.5). The counts of living donations range from 0 to 337 (median=33.5, mean=52.5). Application and living donation counts were found correlated ($\rho=0.69$, $p<0.0001$) but with some uneven distributions (eg. center with 138 donations only submitted 3 applications). There are 29 programs that did >100 living donor transplants in a recent 2-year period. Among these 29 programs, the range of program penetration ranged from 2% (3 applications in 2 years) to 48% (86 applications in 2 years).

Conclusion: Transplant center usage of the program is uneven and could be improved. Although all donors do not qualify for the program, donors that do qualify should be given equal access to the federal funding. Improving education as well as monitoring and reporting transplant center participation may be the key to equalizing patient access.

Amit Mathur, MD, Robert Merion, MD, Jaiwei Xing, Barry Hong, PhD, Kimberly Gifford, MBA, Patricia Holly Warren, RN, Akinlolu Ojo, MD, PhD, MBA

ABSTRACT C4-B

NOVEL METHOD TO INCREASE ORGAN DONATION REGISTRATION AT A TRANSPLANT CENTER

Fauzia K. Butt, MD, FACS, St. John Transplant Specialty Center, Detroit, MI

Purpose: Our state has been fortunate in that the Secretary of State has partnered with our local OPO and eye bank to make the organ donation registry a key health initiative. Success has been demonstrated by an increase in registered adult organ donors from under 30% in 2010 to greater than 50% in 2016. While this is an admirable accomplishment, an insufficient supply of organs remains the major obstacle in fulfilling the promise of transplantation. Supporting this initiative, our transplant center partnered with an artist, who is also a transplant recipient. An interactive art exhibit was designed to increase organ donation registrations during National Donate Life Month 2016.

Methods: In April 2016, our transplant center unveiled an art exhibition entitled “Donating Life” in our lobby. The artist had received a living donor kidney transplant from his father when he was two years old and he was interested in increasing organ donation awareness. His artwork consisted of over 200 wooden silhouettes representing thousands of men, women and children awaiting organ transplants, each containing a kidney-shaped empty space. Visitors who registered as organ donors signed their names on wooden kidneys and placed them into the empty silhouettes, representing potential future donations. The hospital’s social media team partnered with local news coverage, emphasizing the interactive art experience during their broadcasts, to promote organ donation. The art exhibit was featured in the lobby during the entire month. Educational literature on organ donation was provided, highlighting facts and common myths. The exhibit was staffed 3 days each week by a volunteer transplant recipient, an OPO staff member and a representative of our transplant program. Hospital visitors and

employees were encouraged to learn more about organ, tissue and eye donation. Onsite electronic enrollment for the state donor registry was offered. All living kidney donors at our center who donated during that month also participated by signing their names on wooden kidneys and placing them into the recipient figures. Each living donor and recipient pair was photographed in front of the art exhibit and featured in our hospital system e-newsletter, thereby reaching a larger audience.

Results: Our donor registration rate increased 10-fold over the previous year. The number of registrations in April 2016 was 25, as compared to only 2 in April 2015, representing just over a 1000% increase. Our donor service area consists of 184 critical care units, including 9 transplant centers. Our transplant center contributed the second highest number of new registrations during National Donate Life Month 2016. The OPO reported that our transplant center generated 17% of the new donor registrations produced by the 9 transplant centers. In the following month, we duplicated this effort at an affiliated, non-transplant hospital and experienced even more impressive results. The art exhibit was displayed in the lobby for 1 week and staffed for 4 days, resulting in 20 new organ donor registrations.

Conclusions: An interactive art exhibit offered a tangible manifestation of the promise of a future donation. The number of new enrollments increased when the display was staffed as representatives were available to answer questions, provide educational materials and the opportunity for immediate electronic registration. Our findings indicate that presenting this art exhibit as an educational opportunity at a non-transplant center may be an even more effective tool. We plan to offer this engaging experience as a rotating exhibit in an ongoing effort to promote organ donation awareness and continue to increase the number of new donor registrations.

Gavin M. Ambrosi, MD, Levi Faber, Jennifer Kuhar, BS, Darla K. Granger, MD, FACS, Fauzia K. Butt, MD, FACS

CATEGORY 5:

Transplant Data: Analysis, Reporting and Research

ABSTRACT C5-A

DEVELOPING A SPECIALIZED TASK FORCE TO IMPROVE PATIENT ENGAGEMENT AND LIVING KIDNEY DONOR FOLLOW-UP POLICY COMPLIANCE

Jaclyn Bannon, MHA, Johns Hopkins Hospital, Baltimore, MD

Situation:

OPTN/UNOS policy 18.5.A requires transplant centers to 'report accurate, complete, and timely follow up data for donor status and clinical information' at 6-months, 1 -year, and 2-years post-donation. While 2-year follow-up has been required policy since February 2013, transplant centers are struggling to meet the maximum threshold of 80% clinical status and 70% laboratory for living kidney donors (LKDs). Two-year follow-up is now considered to be the standard of care for all prospective LKD's, and is clinically considered routine care. However, 2-year follow-up is not allowable on the Medicare Cost Report and therefore has been an unfunded mandate with additional barriers to patient engagement.

Interventions:

In 2015 our transplant center performed 254 kidney transplants including 67 LKD transplants. In August 2016, the OPTN/UNOS Membership and Professional Standards Committee (MPSC) issued our center a letter of noncompliance with Policy 18.5.A. We immediately created and convened a multidisciplinary task force to improve follow-up rates and LKD's patient engagement co-chaired by the transplant center regulatory manager and research faculty from the department of surgery. The purpose of our task force was to evaluate current follow-up care processes in addition to developing new innovations for improved long-term patient engagement and living donor follow up (LDFU) compliance. The task force is comprised of transplant administrators, clinicians, transplant research team members, data scientists, and prior LKD's. The regulatory manager provides a monthly update of the task force to the departmental QAPI meetings and reports progress to hospital leadership.

The task force discussed guidance from the OPTN/UNOS Living Donor Committee on follow-up data collection. Areas for improvement were identified through a systematic and data-driven approach, and process barriers were identified. The task force developed an action plan to address these barriers, and will meet bimonthly for 3 years. The action plan included revisions to our current follow-up protocol and the addition of new elements (Table 1). The action plan and task force activities were submitted as part of the corrective action plan regarding our noncompliance with OPTN/UNOS policy 18.5.A to the MPSC.

Table 1. Task Force Action Plan

1	Change in follow up protocol driven by clinical NP	Revision
2	Developed PCP communication plan	New
3	Post-donation Plan of Care Contract	New
4	Discharge education materials	Revision
5	Donor contact scripts (email/telephone)	Revision
6	Initial follow up pushed earlier	Revision
7	Payment of parking costs during follow-up visit	New
8	Expanded partnership with International Office	Revision

Conclusions:

Early preliminary results of the task force indicate improvement in our LDFU rates since its implementation in August 2016 (Table 2). Task force participants report improved confidence and enthusiasm for improving the LKD's experience throughout the continuum of donor care.

Table 2. LDFU rates pre and post implementation in August 2016

Month		6 months	1 year	2 years	Overall
April	**Clinical**	2/3 (67%)	1/5 (20%)*	3/6 (50%)	6/14 (43%)
	Laboratory	0/3 (0%)	3/5 (60%)*	4/6 (67%)	7/14 (50%)
May	**Clinical**	6/6 (100%)	5/8 (63%)	3/6 (50%)	14/20 (70%)
	Laboratory	5/6 (83%)	5/8 (63%)	2/6 (33%)	12/20 (60%)
June	**Clinical**	5/6 (83%)	2/4 (50%)	6/9 (66%)	13/19 (68%)
	Laboratory	4/6 (66%)	2/4 (50%)	5/9 (56%)	11/19 (58%)
July	**Clinical**	0/2 (0%)	4/5 (80%)	4/6 (66%)	8/13 (62%)
	Laboratory	0/2 (0%)	4/5 (80%)	3/6 (50%)	7/13 (54%)
August	**Clinical**	7/7 (100%)	6/7 (86%)	6/8 (75%)	19/22 (86%)
	Laboratory	7/7 (100%)	4/7 (57%)	5/8 (63%)	16/22 (73%)
September	**Clinical**	4/5 (80%)	3/3 (100%)	4/4 (100%)	12/16 (75%)
	Laboratory	2/5 (40%)	3/3 (100%)	3/4 (75%)	11/16 (69%)
October	**Clinical**	4/5 (80%)	3/3 (100%)	4/4 (100%)	11/12 (92%)
	Laboratory	2/5 (40%)	3/3 (100%)	3/4 (75%)	8/12 (67%)

*International patients included

Implications/Relevance:

Implementation of a specialized task force allows for increased capacity to solve clinical and regulatory problems collaboratively and can develop novel techniques to improve the health and wellbeing, engagement and interaction with living organ donors.

References:

Organ Procurement and Transplantation Network (OPTN) Policies – Policy 18.5.A: Living Donor Data Submission Requirements.

"Guidance for Developing and Implementing Procedures to Collect Post-Donation Follow-up Data from Living Donors", developed by the OPTN/UNOS Living Donor Committee.

Authors: Jaclyn Bannon, MHA, Corey Wickliffe, BS, Alvin Thomas, MSPH, Alyssa Klingbell, CRNP, Janet Hiller, RN, Samantha Halpern, BS, Dorry Segev, MD, PhD, and Macey Henderson, JD, PhD

ABSTRACT C5-B

QUANTIFYING PROGRAMMATIC CHALLENGES OF EVALUATING ELDERLY CANDIDATES FOR KIDNEY TRANSPLANT

Daniel Pieloch MS, RD, Robert Wood Johnson University Hospital, New Brunswick, NJ

Problem: The new Kidney Allocation System (KAS) has negatively impacted the elderly population particularly those requiring deceased donor transplants. With longer expected waiting times and more restrictive access to the deceased donor pool less transplants and poorer outcomes in this already higher risk population are a real possibility. We look to further explore the impact KAS has on outcomes and transplant program productivity of elderly patients awaiting deceased donor transplant.

Approach: To this end we performed two separate analyses. The first was an internal productivity assessment between our elderly and non-elderly transplant candidates who underwent evaluation at our program between the years 2010-2015. Performed June 2016 it was meant to identify differences in resource utilization and process outcomes in the new KAS. The second was to develop a tool to ultimately identify which elderly candidates would have acceptable risk profiles to begin a full transplant evaluation at our center post KAS implementation. This novel prognostic tool is called the Age-Adjusted Kidney Transplant Morbidity Index (KTMI) and was validated with retrospective analysis of the OPTN/UNOS database which consisted of 96,474 adult patients who received kidney transplants between 2000-2010. The Age-Adjusted KTMI scoring scale can be found in Table 1.

Findings: Of the 1669 patients who underwent a full kidney transplant evaluation between 2010-2015 roughly 26% (n=437) were aged 65 years or older with a median age of 69 years compared to a median age of 51 for the non-elderly cohort. As seen in Figure 1. non-elderly candidates at time of evaluation are 3.7 times more likely to get transplanted at our center compared to elderly patients.

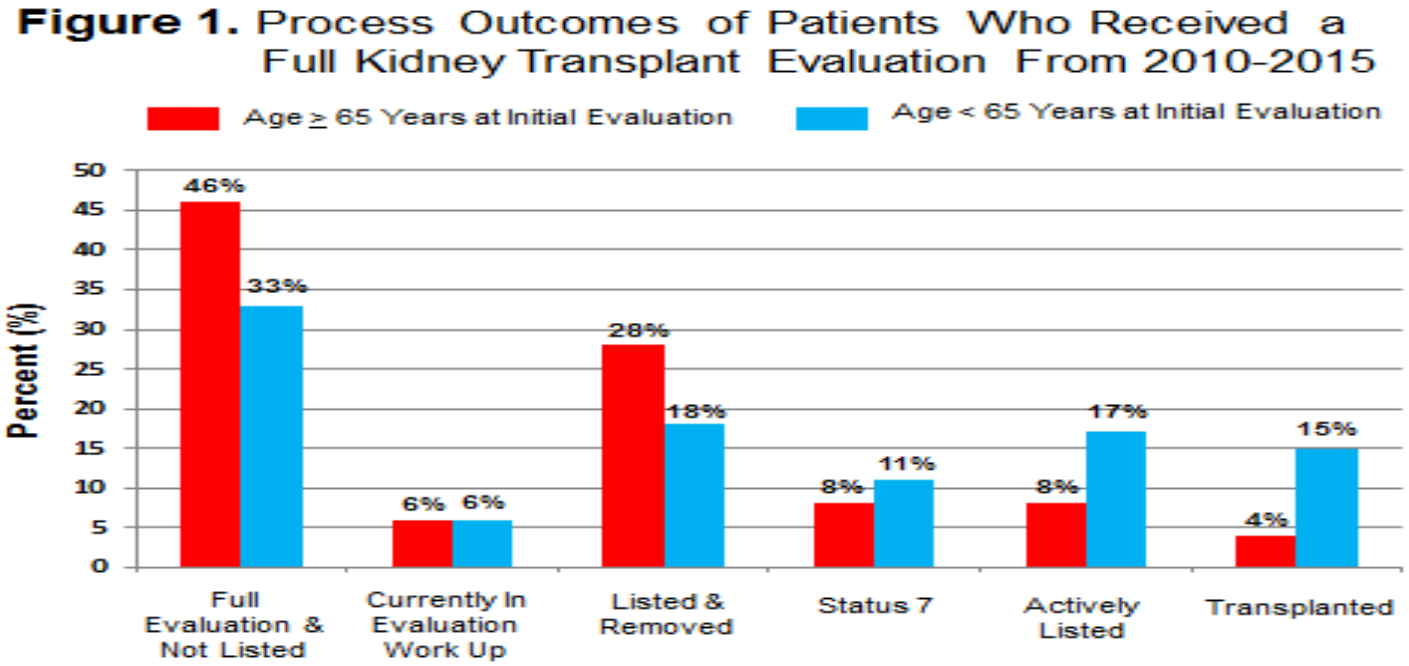


Figure 2 and Figure 3 display the results of Kaplan Meier 3-year patient and graft survival curves by age group in relation to Age-Adjusted KTMI score. There is a significantly lower graft and patient survival rate in the elderly compared to the non-elderly cohorts across all Age-Adjusted KTMI scores ($p<0.05$). More importantly a sequential decrease in graft and patient survival is seen as both age and Age-Adjusted KTMI score increases.

Table 1.

Age-Adjusted KTMI Scoring Scale

Comorbidity	KTMI Points
Dialysis Dependency (years)	
0	0
0 – 4	1
> 4	2
Diabetes	
No	0
Yes	1
Coronary Artery Disease	
No	0
Yes	1
Cerebral Vascular Disease	
No	0
Yes	1
Peripheral Vascular Disease	
No	0
Yes	1
Body Mass Index (kg/m²)	
≤ 35	0
> 35	1
Previous Transplant	
No	0
Yes	1
Functional Status	
No Assistance	0
Needs Assistance	1
	Total Score

Implications: The new KAS puts the majority of elderly patients awaiting deceased donor transplant at a disadvantage because they are less likely to get transplanted. Despite a 4.6% increase in deceased donation in 2015 the elderly population saw a 22.9% decrease that year according to a recent OPTN Kidney Transplantation Committee analysis and likely contributed to the lower than expected transplant rate seen in our elderly patients.

Figure 2. 3-Year Graft Survival of Deceased Donor Kidney Transplant Recipients by Age Group and Comorbidity Level: UNOS Data from 2000-2010

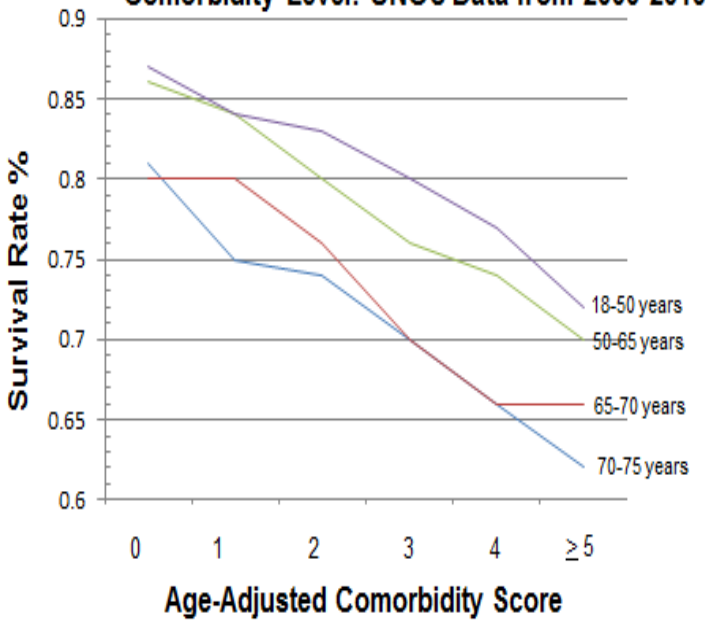
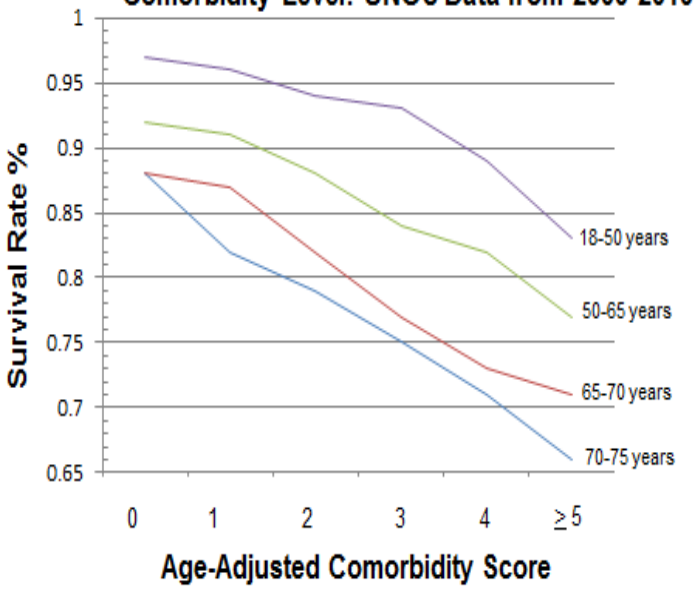


Figure 3. 3-Year Patient Survival of Deceased Donor Kidney Transplant Recipients by Age Group and Comorbidity Level: UNOS Data from 2000-2010



Less transplants mean longer waiting times and higher attrition rates with a nearly 75% attrition rate to date seen at our center despite a screening process prior to receiving an evaluation. This data helps quantify the amount of non-productive resources utilized and identified the need to make changes to our process to improve productivity. Knowing elderly patients come with higher graft failure and mortality risks it is important to identify those patients with acceptable risks profiles that are likely to receive a transplant earlier in the process. The Age-Adjusted KTMI helps quantify this risk. With an aging ESRD population it is critical that programs address how the new KAS impacts their productivity and outcomes in their elderly population. This data also highlights the importance of pursing living donation for elderly candidates in the new KAS.

ABSTRACT C5-C

UNOS DATA SERVICES PORTAL PROVIDES DOZENS OF ANALYTIC TOOLS FOR TRANSPLANT CENTERS AND OPOS

Sarah Taranto, UNOS, Richmond, VA

Problem/situation:
The OPTN transplant database is a tremendous resource to the transplant community. OPTN members have access to the data but often lack the resources or skillset to translate data into usable information. On average, UNOS responds to more than 400 data requests each month from members. Although this transactional system is necessary, UNOS recognizes the need to be more proactive in data management. Through partnering with the transplant community, UNOS set out to develop new and innovative analytic tools for reviewing organ acceptance practices and monitoring various center activities to help improve the outcomes of pre and post-transplant patients.

Approach:
During the summer of 2015 a pilot group from the transplant community was gathered to develop a tool to allow transplant centers and OPOs to review organ offers and acceptance patterns in close to real time. The new Data Services portal in UNET along with this Report of Organ Offers (ROO) were implemented in December, 2015. The ROO includes both a raw data file along with a Tableau visualization (see Figure 1) of the information. During 2016, more reports and visualization tools are continuing to be deployed within this new secure environment. These include: the Center STAR files, a visualization tool to monitor program waiting list activity, an updated living kidney donor follow-up report (Figure 2), and more than 30 other individual reports similar to those most often requested by centers and OPOs through the data request system. Examples include reports of waiting list registrations and transplants with citizenship information as required by CMS, listings of transplants performed with PHS increased risk donors, and listings of recipients and living donors for whom follow-up forms will be generated during the next several months to allow for easier scheduling of visits.

Figure 1.

Figure 2.

Donation Time Period	Number of Living Kidney Donors Recovered within Donation Time Period	Number of Expected Follow-up Forms	Living Kidney Donor Follow-Up Form	Number of Living Kidney Donors Recovered With Required Donor Status and Clinical Information	% of Living Kidney Donors Recovered With Required Donor Status and Clinical Information	K
February 1, 2013 - December 31, 2013	30	30	6-Month	26	86.7	
February 1, 2013 - December 31, 2013	30	30	1-Year	26	86.7	
February 1, 2013 - December 31, 2013	30	30	2-Year	8	26.7	
January 1, 2014 - December 31, 2014	10	10	6-Month	9	90.0	
January 1, 2014 - December 31, 2014	10	10	1-Year	6	60.0	
January 1, 2014 - May 31, 2014	4	4	2-Year	4	100.0	
January 1, 2015 - November 30, 2015	11	11	6-Month	8	72.7	
January 1, 2015 - May 31, 2015	3	3	1-Year	3	100.0	

Findings/Solutions/Conclusions:
UNOS is providing a large number and variety of analytical tools to assist transplant centers and OPOs. Initial feedback to this effort has been positive. We are aware of many centers setting up weekly meetings and processes to review the data in the ROO and/or downloading the Center STAR files on a monthly basis. As availability of the new reports is better known, the number of ad hoc requests requiring programming should decline as the community is able to find the data they need on demand and in a useful format in this new secure environment. We will be monitoring both the use of the Data Services portal reports and visualizations along with any decline in data requests over the next 24 months. The early results of this monitoring will be available in early 2017.

Implications/Relevance:
The Data Services portal was designed to meet several different purposes. Transplant centers and OPOs have a variety of data needs including preparing for CMS site visits, to monitoring compliance with follow-up and data submission requirements, ensuring the quality of data submission for PSR reports, and reviewing organ acceptance practices just to name a few. Often these needs are urgent and can't wait for a request to be submitted and the report to be custom generated. The Data Services portal meets this need and will continue to improve and provide additional valuable analytic products during the coming months and years.

Authors: Sarah Taranto[1], James Pittman, RN MSN[2], Eric Beeson[1], Ryan Ehrensberger, Ph.D.[1]

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ABSTRACT C5-D

FROM SIMPLE TO SUBLIME: METHODS TO ESTIMATE YOUR SRTR EXPECTED NUMBER OF EVENTS

Austin Gregg, MS, UF Health Shands Transplant Center, Gainesville, FL

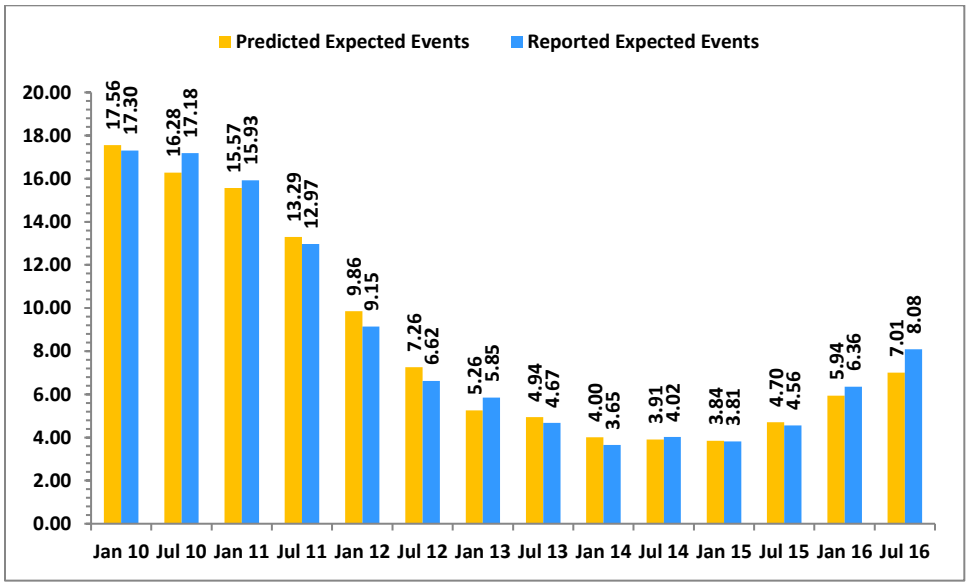
Purpose: To provide transplant administrative and clinical directors with reliable predictions of Scientific Registry of Transplant Recipients (SRTR) risk-adjusted 1-year expected number of events.

Method: Our center uses three distinct methods to predict expected number of events. The first is easily accomplished using a spreadsheet: From the most recent SRTR Program-Specific Report (PSR) the proportion of a (specific) 1-year cohort expected to have an event is calculated by dividing the expected number of events by the overall cohort transplant volume. This quotient, when multiplied to the cohort size for (future/forming) cohorts yet to be reported by the SRTR yields the prediction of expected events.

The second method uses statistical software to emulate the current SRTR Risk Adjustment model for a specific cohort (to be analyzed/reported on in a future SRTR PSR). Operating on an automated monthly data release available through the United Network for Organ Sharing (UNOS) UNET system, it yields an estimate of overall expected number of events based on each constituent patient's unique set of risk adjustment covariates.

Emerging from the process described immediately above, the third method of predicting expected events leverages the power of the SRTR's "Expected Survival Worksheet," which is released with each PSR. Carefully adjusting the spreadsheet one can omit selected patients (i.e. the oldest 6 months' worth of transplants) and, using each patient's unique set of risk adjustment covariates from the second method, add additional patients to constitute cohorts not yet reported on by the SRTR (i.e. cohorts in the next PSR).

Results: The first method described above (based simply on the proportion of the most recently reported cohort expected to have an event) has proven over many years to be a robust predictor of expected number of events. Figure 1 below demonstrates this for our center's 1-year adult liver patient survival cohort.



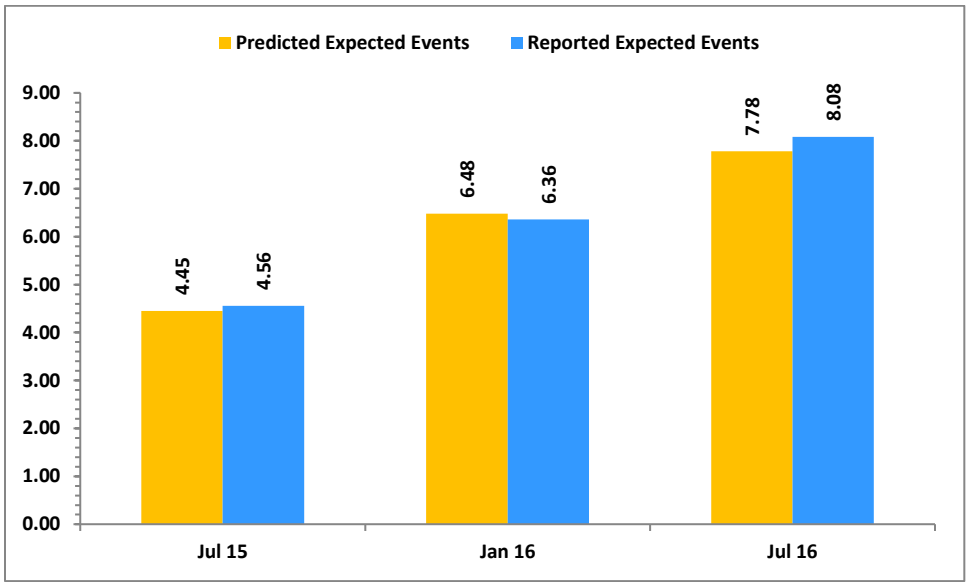
Method 1: Adult liver 1-year patient survival cohort - predicted vs. reported number of events

The second and third methods were only recently implemented by our center, and thus only a few PSR's worth of longitudinal information on its predictive effectiveness exists at this time. What data has been

generated, however, indicates a reasonably close estimation of the actual, SRTR-reported expected number of events is being obtained. (Please refer to the table and chart below.)

PSR	Predicted Expected Events	Reported Expected Events
Jul 15	4.58	4.56
Jan 16	6.73	6.36
Jul 16	7.95	8.08

Method 2: Adult liver 1-year patient survival cohort - predicted vs. reported number of events



Method 3: Adult liver 1-year patient survival cohort - predicted vs. reported number of events

Conclusion: All transplant centers, not yet so doing, should engage in at least rudimentary predictive analytics such as Method 1 described above. In our experience it has reliably provided an early warning when a cohort's outcomes were approaching or clearly in jeopardy of being flagged for underperformance. Moreover it is another means to continuously monitor our patients – and detect when there might be emerging issues.

The new predicative methods (2 and 3 above) we have deployed (based on emulating the SRTR's risk-adjustment model) lead us to a very granular understanding of the risk-adjustment process, which in turn brought about careful scrutiny of transplant data submitted to the UNET system. As a consequence, all patient information is now carefully reviewed by clinical leadership – with rectifications, in some instances, clearly impacting risk adjustment.

Though it is possible to do such with stand-alone statistical programming, adding patients to the SRTR's "Expected Survival Worksheet" (to form future cohorts) provides estimations of outcomes and applies them to regulatory criteria used by the Centers for Medicare and Medicaid Services, and the OPTN's Membership and Professional Standards Committee – complete with sophisticated graphics representing such. The sheet also enables transplant center leadership to engage in hypothetical modeling, adding events likely to happen, or changing high value donor and recipient covariates that impact risk adjustment. Accuracy is also increased, as much of the data employed by the sheet is exactly that used by the SRTR. Using this method to predict expected events - for all of our programs - comes remarkably close to those actually reported by the SRTR.

Austin Gregg, MS, Stephan Moore, MHA, FACHE, CMPE, Karl Womer, MD, Kenneth Andreoni, MD

ABSTRACT C5-E

A NATIONAL REVIEW OF TRANSPLANT QUALITY PROGRAM STAFFING MODELS

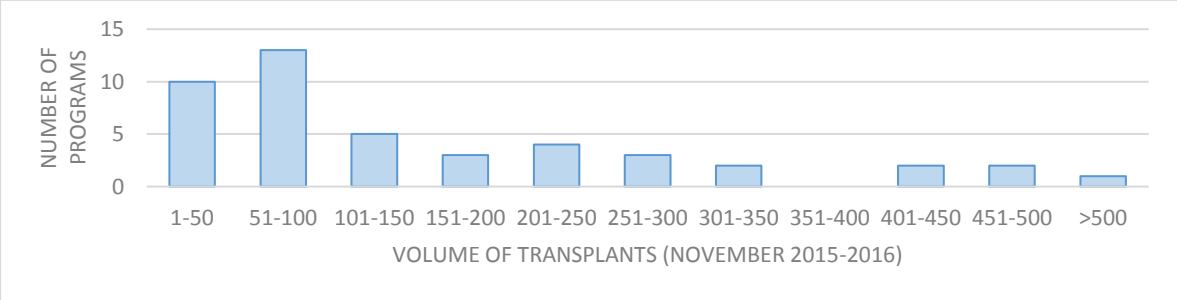
Makenzie Cook, MHA, Vanderbilt Transplant Center, Nashville, TN

Situation: With the ever rising demands of quality in healthcare, requirement of data-driven performance measures, and heightened awareness of regulatory impact, transplant centers must respond by creating sustainable quality programs. There is currently limited data on the constructs of quality programs within transplant centers.

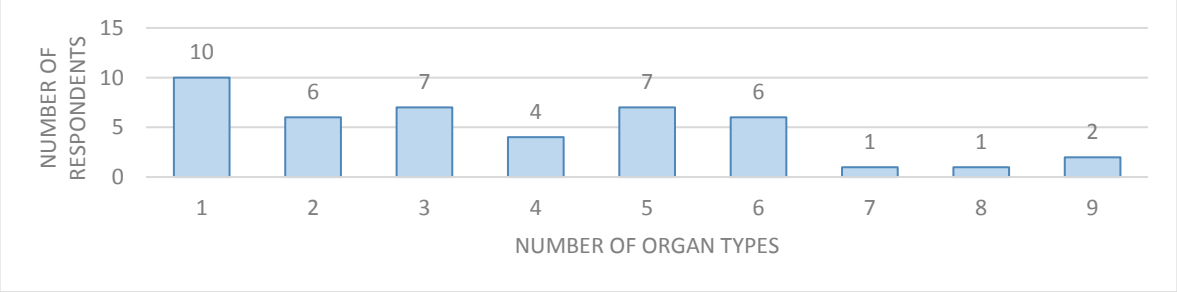
Approach: Using a web-based survey platform, a survey was sent to the UNOS transplant administrators' list serve across the United States. The survey aimed to gain insight on three questions: 1) how do transplant centers across the United States staff their quality programs in terms of FTEs; 2) how do the type of transplant programs offered and volume of transplants impact quality FTE allocation; and 3) which transplant program characteristics impact the relationship between the program and the hospital? The survey results included data from 42 unique respondents. Quality FTE was defined as staff supporting quality assessment and performance improvement efforts and data entry and analysis (i.e.; quality consultant, quality analyst, data analyst, data entry, quality manager).

Findings: Graph 1 below presents 12 month volumes of the transplant programs represented. Of the 45 responses, adult kidney programs represented the largest number indicating that at least 91.1%, or 41 respondents have a kidney program. The majority of respondents indicated that they work in a multi-organ transplant center (see Graph 2), with only 10 respondents being a single-organ transplant center. Graph 3 provides insight on the number of annual QAPI meetings transplant programs have across the nation, ranging from as high as 100 or greater, to 10 or less, with the majority of respondents falling between 10-40 QAPI meetings annually. The total number of FTEs dedicated to a quality program also varies by program (see Graph 4), with a positive correlation to transplant volume (see Graph 5). The number of quality FTEs also has a weak positive correlation with the number of organ programs represented per center (see Graph 6). The number of QAPI meetings has no correlation with the number of quality FTEs (see Graph 7), but does have a slight positive correlation with transplant volume (see Graph 8).

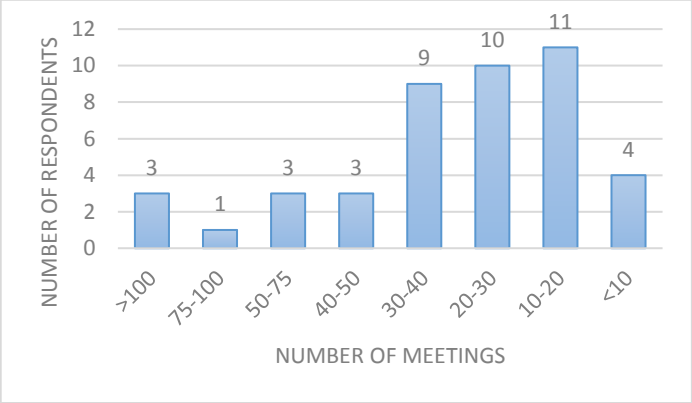
Graph 1: Volume of Transplants



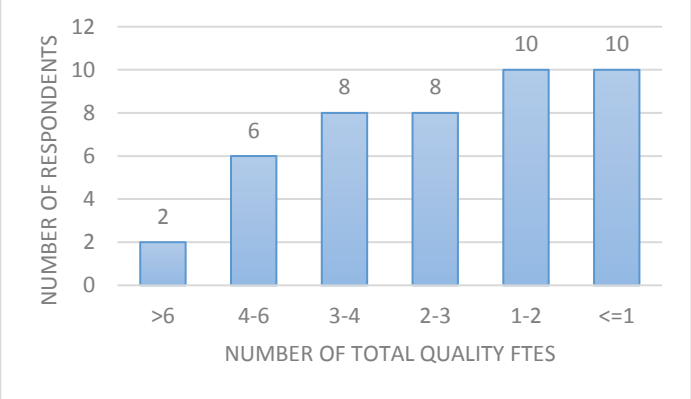
Graph 2: Number of Organ Programs per Respondent



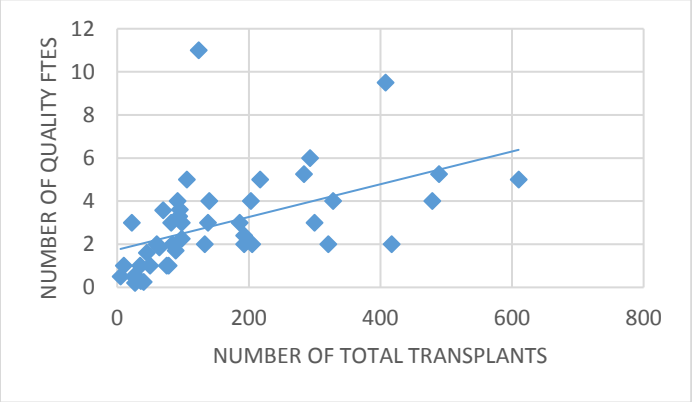
Graph 3: Number of Annual QAPI Meetings



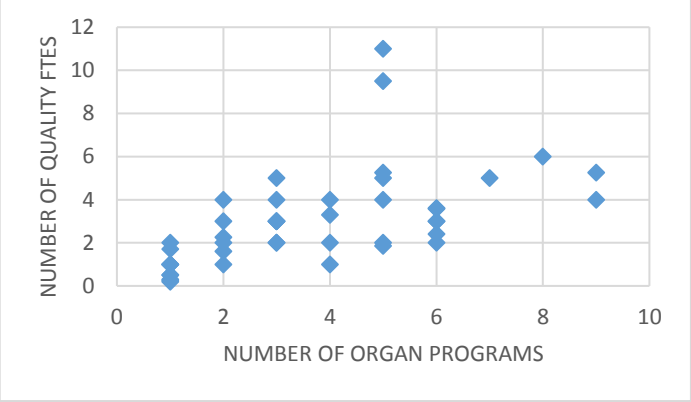
Graph 4: Total Quality FTE Breakdown



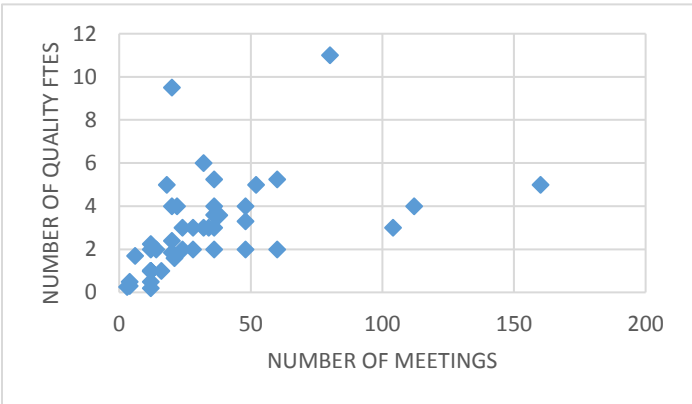
Graph 5: Number of Quality FTEs vs. Total Transplant Volume



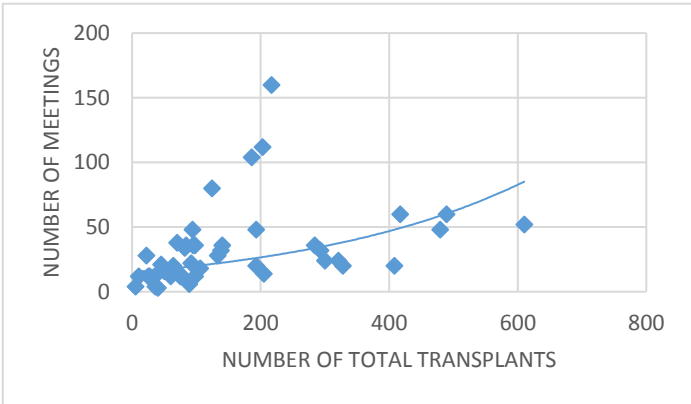
Graph 6: Number of Quality FTEs vs. Number of Organ Programs



Graph 7: Number of Quality FTEs vs. Number of QAPI Meetings



Graph 8: Number of QAPI Meetings vs. Total Transplant Volume



Implications: The survey suggests that the number of QAPI meetings and quality FTEs do not appear to be industry standards but rather the result of individual transplant center preference. Nevertheless, the total number of transplants is positively correlated to the number of quality FTEs. Future study would be beneficial to determine if there is an optimal staffing model for transplant quality programs and to learn how transplant volume variability impacts the efficiency of current FTE staffing models.

Makenzie Cook, MHA, Brian Modisett, MBA(2017), Lauren Smith, MBA(2017), Jerita Payne, ACNP-BC, MMHC, Edward Zavala, MBA