

## CASE STUDY FOR QUALITY IMPROVEMENT

# Solid Organ Transplant Transplant Diabetes Program

## STANFORD HOSPITAL AND CLINICS

### Organization Profile

The Transplant Diabetes Program at Stanford Hospital & Clinics addresses diabetes through a multidisciplinary approach. Started as a grassroots effort in 1995, the Transplant Diabetes Program, part of a multi-organ transplant program, operates 2 clinics to treat adults who are pre- and post-solid organ transplant. Clinic patients are in diabetes-related organ failure.

Transplant physicians, diabetes educators, endocrinologists, nurse transplant coordinators, registered dietitians, and pharmacists work together to coordinate comprehensive quality care that is accessible to the patient. It currently employs the services of 29 MDs (30% transplant surgeons; 70% medicine physicians) and 1 endocrinologist part-time. Physicians come from more than 8 specialties such as pre- and post-transplant hepatology, nephrology, pulmonology, and cardiology. The clinic provides more than 750 outpatient visits per year, including return/follow-up.

The clinic began a phased implementation of the EMR system in 2008.

### Project Summary

The Transplant Diabetes Program was started in response to a need to streamline education and minimize duplication of effort by multiple health care providers working directly with the transplant diabetes (DM) population. Support grew from users of the program (the patients and their families) and the Transplant Nurse Coordinators who were dealing directly with these patients on a daily basis.

Early, patient-centered, transplant-specific DM self-management education in conjunction with close follow-up has established the Transplant Diabetes Program as unique within the transplant community. The complex nature of multi-organ transplantation carries potential side effects, which are amenable to early intervention. Patients educated in the Transplant Diabetes Program are empowered with a proactive approach that helps ensure a positive outcome in the transplantation process. When patients are provided with early consistent DM education, from a multidisciplinary team, the variables affecting good health are better appreciated and they become more proactive in their care.

Active members of the Transplant Diabetes Program share a high level of commitment to the transplant population and their complicated medical management.

### Goals and Objectives

Controlling diabetes is one of the most important things a patient can do to ensure the success of a transplant. The Transplant Diabetes Program works with adult transplant patients and their families to

- Decrease diabetes-related hospital readmissions of multi-organ post-transplant recipients with pre-existing and post-transplant diabetes (PTDM)
- Optimize glycemic control (pre-transplant fasting blood glucose of 80-120 mg/dL)

- Decrease or prevent diabetes complications, such as cardiovascular disease, in a high-risk population
- Prolong transplant graft survival

## Team Composition

The clinic team comprises more than 70 members in a multidisciplinary team including: transplant nephrologists; transplant hepatologists; transplant cardiologists; transplant pulmonologists transplant surgeons; endocrinologist; transplant nurse coordinators; transplant social workers; transplant pharmacists; transplant dietitians; and transplant DM educator and program/research coordinator. Of these, a core group of 6 make up the actual day-to-day work force.

## Diabetes Intervention and Population Baseline

Percent of total transplant patients who develop PTDM or have diabetes prior to transplant:

By organ:	By sex:	By ethnicity:
<ul style="list-style-type: none"> <li>• 40% kidney</li> <li>• 37% liver</li> <li>• 30% heart</li> <li>• 32% lung and heart/lung</li> </ul>	<ul style="list-style-type: none"> <li>• 57% male</li> <li>• 43% female</li> </ul>	<ul style="list-style-type: none"> <li>• 47% Caucasian</li> <li>• 24% Hispanic</li> <li>• 11% Asian</li> <li>• 6% Pacific Islander</li> <li>• 4% Indian sub-continent</li> <li>• 2% Black</li> <li>• 1% Middle Eastern</li> <li>• 1% Native American</li> </ul>

## Patient Composition

Among diabetic transplant patients, 8% are type 1, 65% are type 2, and 27% develop diabetes post-transplant (new onset).

For type 1 patients, the mean duration of pre-existing diabetes by transplant category is 17.8 years for the liver and kidney group and 24.3 years for the heart, heart/lung group.

For type 2 patients, the mean duration of pre-existing diabetes by transplant category is 12.4 years for the kidney and liver group and 7.4 years for the heart, heart/lung group.

## Registry Equivalent

All transplants are included in an Integrated Solid Organ Transplant database, TransChart, organ transplant software for tracking and managing transplant patients (or any patients

with chronic conditions). TransChart is accessed by the transplant RN coordinator (pre and post), transplant social worker, transplant physician and surgeon, transplant RD (pre and post), transplant PharmD, transplant CDE, and transplant insurance coordinators. While it coordinates data collection and communication and contains a Txp/DM registry, it does not interact with EPIC, thus requiring manual input to the EMR.

## Behind-the-Scenes Work

It is important for the program to maintain transparency of its services and its providers. Program development included the use of patient and provider interested party analysis questionnaires, forums, and satisfaction surveys; grant applications and resources to aid in cost-sharing and coordination for the core Transplant Diabetes team sponsored by Transplant Program medical and surgical directors; and endocrine division-supported endocrinologist to provide in- and out-patient consultation to the Transplant team physicians and patients.

Full-time clinical staff working with the in-patient transplant population had scheduled time to provide support and continuity of care to the Transplant Diabetes Program. Algorithms, medical record forms, databases, and patient plan-of-care strategies were created to support the program's protocols, goals, and standards of care.

Coordinators provided the link to the transplant physicians, transplant surgeons, and transplant physician assistants who wrote the orders to implement program recommendations and to refer patients into the program. Transplant Program Directors were compelled to provide support for research, secure clinic space, and obtain funding for the Program Research Coordinator. Directors of each transplant group worked cooperatively to provide funding.

## Work Flow Changes

It is important to note that the Transplant Diabetes Program and regular outpatient clinic occupy clinic space simultaneously, and it was important to allow for development of tracking materials specific to the transplant populations.

Therefore, the RD and Program/Research Coordinator set aside time to

- Provide routine duties for inpatient care
- Develop program materials
- Designate established output clinic times
- Coordinate space allocation
- Secure initial grant funding
- Meet with department directors to secure support
- Offer in-service Solid Organ Transplant Team services/benefits

## Information Gathering/ Transmission Tools

In general, transplant patients want and will go almost anywhere for information. It is important that more and easily accessible information and tools be provided for them.

- TransChart (Solid Organ Txp Database and communication mode described previously)
- Downloadable glucose meters
- Continuous glucose monitoring system (CGMS) selectively through Endocrinology
- Website
- Email, telephone, and fax

## Changing MD Practice

The entire team, including physicians, was charged with adopting routine changes to ensure coordinated/consistent care for optimal outcomes and to avail themselves of offered in-services, information, and tools relevant to transplant diabetes patients:

- Ensure close attention to transplant protocols
  - Visibility: Attending and participating in rounds
  - Attending and participating in transplant team meetings
- Conduct one-on-one meetings to identify common goals and develop consistency in speaking toward MD's goals
- Offer in-services on usable reference tools and resources, e.g., Txp/DM Reference Tool
- Provide access to research studies involving glycemic control

## Improvement Interventions

Convenient materials for patient use established and reinforced program standards and were perceived as time-savers:

- Transplant Diabetes Reference Tool for outpatient use: A pocket-sized tool with quick reference regarding treatment modality options, transplant-specific considerations, referenced standards, diagnostic criteria, contact information, and guidelines for ordering consults
- Pre-printed diabetes supplies order form for discharge and outpatient use (quick, standardized form for transplant needs)

## Measures Used

Because the diagnosis of PTDM has no universally accepted definition, the program used the standard diagnostic criteria provided by the Expert Committee on the Diagnosis and Classification of Diabetes Mellitus in addition to having any one of the following: Fasting Blood Glucose (FBG) >126 mg/dL on 2 or more occasions; random glucose of >200 mg/dL with symptoms on 2 or more occasions.

Efficacy was determined by utilizing pre-established, evidence-based standards from the American Diabetes Association (ADA), the American Association of Diabetes Educators

## Outcomes and Successes

In addition to patient improvements to the above measures, program success was demonstrated through:

- 40% reduction of DM-related re-admissions 1 year post-transplant
- 95% patient satisfaction rating
- 94% provider satisfaction rating
- 26% decrease in the incidence of rejection
- % patients in control (A1C <7%): 21% improvement (statistical significance=12, p>.05)
- Diabetes-related hospital readmissions: 37% improvement (statistical significance=6.96, p>.05)

The Transplant Diabetes program is one of only a few programs designed to empower the patient. It is known for its consistency and communication.

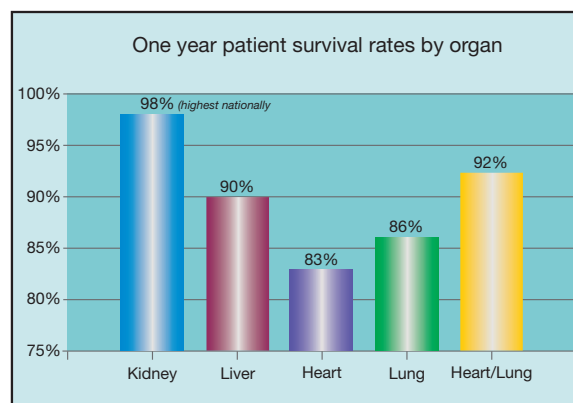
(AADE), and the American Transplant Congress (ATC) Clinical Practice Guidelines.

Specific measures included: quarterly laboratory values; medical record review; compilation of patient satisfaction survey; pre- and post-transplant DM knowledge assessment test; tracking of hospital readmissions; measurements of lipids; quarterly HbA1C; creatinine; pre- and post-transplant body mass index (BMI); neuropathy screening; annual eye and foot exam monitoring; continued smoking cessation; monthly review of home blood glucose logs; hospital readmission for DM-related complication tracking; patient and provider satisfaction surveyed; and transplant rejection review.

### Challenges or Obstacles

The major challenges facing the transplant diabetes team are space and time. Time is a consistent challenge among busy health care practitioners and space usage requires a good deal of flexibility because the program has access to space in the outpatient clinic 1 day per week.

A third is funding. There was a need to advocate for less expensive health care professionals rather than an MD, develop protocols to support increased use of allied health professionals, and look for JCAHO standards to support increased staffing.



### Future Steps

Looking to the future, the transplant diabetes team sees 3 pressing needs:

- Develop protocol for transplant pharmacists to adjust DM medications
- Secure funding for inpatient/outpatient cystic fibrosis dietitian
- Acquire physician assistant or nurse practitioner for Transplant Diabetes Program

## Lessons Learned

Topping the list of lessons is recognition of the power of speaking up and taking your cause to a higher level.

- Find a champion(s): be sure your administrator knows what you are doing and what you are accomplishing.
- Keep it interesting and make it desirable to the clinic and program staff.
- Collaborate; define common goals in meaningful language: each discipline involved in the transplant process has been key to the growth, success, and improved outcomes of the program, which translates to enhanced DM care. The program's research supports these benefits and furthers the studies of other medical and educational interventions to improve patient outcomes.
- Consistently communicate internally and externally.