OPTN/UNOS Pancreas Transplantation Committee
Report to the Board of Directors
June 28-29, 2011
Richmond, VA

Summary

I. Action Items For Board Consideration

- None

II. Other Significant Issues

- The Islet Subcommittee developed and distributed a survey of islet programs to determine barriers to islet placement and procurement from the transplant center perspective. Islet transplant programs indicated that many of the barriers to islet transplantation are financial in nature. (Item 1, page 3)

- The Outcomes Subcommittee is investigating the donor and recipient factors that contribute to improved outcomes for pancreas-after-kidney (PAK) recipients. (Item 2, page 5)

- The Pancreas Transplantation Committee reviewed and endorsed two pancreas waiting time modification or transfer cases. (Item 3, page 10)

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Dixon B. Kaufman, MD, PhD, Chair
David A. Axelrod, MD, MBA, Vice Chair

This report includes items addressed by the Pancreas Transplantation Committee (the Committee) at its meetings held on October 29, 2010 and March 17, 2011.

1. Islet Subcommittee Update

On March 17, 2011, Brian Flanagan, PhD, co-chair of the Islet Subcommittee, updated the Committee on the work of the Islet Subcommittee. Pancreatic islet transplantation in the US has experienced a dramatic rise and fall in activity since the report of the Edmonton Trial in 2000. After peaking in activity in 2002 at 142, transplants declined to 66 in 2008. The subcommittee previously asked representatives of the OPO community what they perceived to be barriers to islet procurement and placement. OPO representatives identified the following barriers:

- Logistics
- Volume
- Preservation solution
- Reimbursement

In August 2010, the Pancreas Transplantation Committee recommended that the subcommittee investigate what the islet programs, including inactive programs, perceive to be barriers to islet transplantation. In January 2011, the subcommittee sent a survey to islet programs to gather feedback on these barriers. **(Exhibit A)**

Jennifer L. Wainright, PhD, UNOS Research liaison to the Committee, presented the results of the survey sent to active and inactive pancreas islet programs to determine barriers to islet transplantation. **(Exhibit B)**

The subcommittee surveyed 44 pancreas islet programs. One program reported that they had never had a functioning islet program, and that program was deleted from the list of programs. Out of the remaining 43 islet programs surveyed, 100% of active islet programs responded to the survey (n=20, including two programs that were excluded from analyses because they currently perform only autologous islet transplants). 95.7% of inactive programs responded (22 out of 23 inactive programs).

Participating active programs reported that they performed pancreas islet transfusions for a total of 91 patients since January 1, 2009 (a period of approximately 24 months). Program directors (94.1%) made up the largest group of respondents, followed by transplant surgeons (5.9%; n=1). Programs reported program volume for the past two years. They reported a range of 0-14 patients from January 2009 to January/February 2011, with an average of 5.1 patients during that period.

Most programs (83.3%) have a procurement team to recover pancreata for islet isolation, and that same number is willing to accept for isolation pancreata that were recovered by another program's team. Most programs are able to travel locally (94.4%) and regionally (72.2%), but only 16.7% of programs can travel nationally to recover a pancreas for isolation. Most programs reported that they have between 1 and 5 people on their pancreas islet isolation team, but some programs had more personnel available for the task.

Programs answered a variety of questions about the criteria they use in deciding which pancreata will be accepted for islet isolation. Most programs said that they were willing to accept a pancreas preserved in any of three preservation solutions (UW, HTK, and SPS), but more were willing to accept organs in UW (100%) than in HTK (87.5%) or SPS (82.4%). Programs were willing to accept organs preserved in UW for an average (median) maximum of 12 hours, in HTK for 10 hours, and in SPS for 9 hours.

Programs indicated which information about potential pancreas donors they thought was important for their program to receive. Most programs said that the amount of insulin utilization (83.3%) and A1c (77.8%) were important to know. Smaller majorities of programs also said they thought it was important to know lipase with reference range (66.7%) and timing of steroid administration (55.6%).

Programs provided their general exclusion criteria for pancreas islet donors for both islet transplant and for research. As expected, criteria for pancreata intended for research generally were looser than criteria for pancreata that were used for islet transplant. Programs had a higher maximum age for pancreata that would be used for research than for those used for islet transplant (i.e., they are willing to accept older donors for research organs). Programs' minimum age requirements for donors did not show as much variation between organs meant for research versus those meant for islet transplant. As with age, programs reported stricter maximum BMI criteria for donors whose organs would be used for islet transplant than for donors whose organs would be used for research.

Programs indicated which donor characteristics were exclusion criteria for organs intended for islet transplant and research. HCV and HBV seropositivity were exclusion criteria for 100% of programs for both islet transplant and for research. Being a CDC high risk donor was an exclusion criterion for 93.3% of programs for islet transplant and for 75.0% of programs for research. Abnormal A1c despite no diabetes was an exclusion criterion for 86.7% of programs for islet transplant, but for only 31.3% of programs for research. Similarly, DCD (donation after cardiac death) donors were excluded by 66.7% of programs for islet transplant, but by only 18.8% of programs for research. Few programs (20.0% for islet transplant and 12.5% for research) excluded donors with abnormal amylase or lipase.

Programs rated the relative importance of possible barriers to pancreas islet transplantation, with possible responses including "4: Major barrier"; "3: Moderate barrier"; "2: Minor barrier"; and "1: Never a barrier". The most highly rated barriers (i.e., rated between 3 and 4 on a scale of 1-4) were OPO charges, logistical issues in receiving the organ from remote sites in a timely manner, transportation costs, being charged the full SAC and islet preparation costs when the islets are not transplantable, waivers denied by OPO at time of offer, immunosuppression costs, time of offer for islets occurring after recovery is complete, and recovery team charges. Other notable barriers (i.e., rated between 2 and 2.9 on a scale of 1-4) included poor quality organs, consent for research not obtained, isolation facility costs, procedure costs, poor recovery technique, greater reliance on DCD approach by OPO, consent for donation not obtained, and organ recovery prior to availability of donor serological testing. Lower rated barriers (i.e., rated < 2 on a scale of 1-4) included not being able to accept an offered pancreas because an isolation team was not available and not being able to accept an offered pancreas because a recovery team was not available.

Funding issues were reported to be important barriers to islet transplantation. Methods commonly reported to be used to fund costs associated with pancreas islet transplant included institution funding (62.5%), philanthropic (56.3%), NIH – part of CIT Consortium (43.8%), JDRF (37.5%), and self-pay by patient (37.5%). Fewer than a third of programs reported the following as funding sources for pancreas islet transplants: IIDP (31.3%), Medicare - covered under the NIH study (31.3%), other insurance (31.3%), grant (31.3%), and NIH – non-CIT (25.0%). Programs also reported methods used to fund costs associated with producing human islets for research, including institution funding (56.3%), IIDP (50.0%),

philanthropic (43.8%), NIH – non-CIT (25.0%), grant (25.0%), JDRF (18.8%), and NIH – part of CIT Consortium (12.5%). Methods used to fund costs associated with non-transplantable clinical isolations included the following: IIDP (46.7%), institution funding (40.0%), philanthropic (40.0%), NIH – part of CIT Consortium (33.3%), JDRF (26.7%), grant (20.0%), and NIH – non-CIT (6.7%).

Inactive programs were asked to explain why their program ceased activity. Many programs said that lack of funding was the cause of their program's inactivation. Personnel changes at the institution were another reason for inactivation.

Islet transplant activity in the US contracted dramatically from 2002 to 2008. These survey results suggest that the major barriers are primarily financial in nature. Specifically, handling of organ acquisition charges, transportation costs, and transportation charges are major obstacles.

The Committee noted that modification of current financial charge practices or approval of islets by third party payers as reimbursable therapy for Type I diabetes is needed for islet transplantation to expand to its full potential. An abstract has been drafted for submission at professional meetings (e.g., IPITA, ATC, AOPO, NATCO). The subcommittee would like to share these findings with the OPO community.

The Committee suggested correlating islet transplant activity with sources of funding to determine if transplants were occurring without NIH funding. Committee members also recommended sharing the survey results with the American Society of Transplant Surgeons (ASTS) to help them in their discussions with the Centers for Medicare and Medicaid Services (CMS). The Committee commented that there is a need for a comparative effectiveness metric between whole pancreas and islet transplantation. Another piece of information that is needed to compare these types of transplants is the true cost of doing an islet transplant.

The Committee noted that islets are particularly complex because they must be processed before they are transplanted, and the transplantability of the islets is not known at the time of procurement. Committee members stated that other organs, such as lung, have similar issues. The Committee thought that the question of how to handle organs that need to be improved to make them transplantable should be addressed across organ type. The Committee suggested bringing this question to the attention of the Policy Oversight Committee.

Islet Subcommittee minutes can be found in **Exhibit C**.

2. Outcomes Subcommittee Update and Evaluation of Pancreas-After-Kidney (PAK) Outcomes

On March 17, 2011, David A. Axelrod, MD, MBA, Vice Chair of the Committee and chair of the Outcomes Subcommittee, reviewed the recent work of the Outcomes Subcommittee. The Outcomes Subcommittee requested data on pancreas graft, kidney graft, and patient survival after a PAK transplant. Raja Kandaswamy, MD, and Sally Gustafson, MS, Scientific Registry of Transplant Recipients (SRTR) liaisons to the Committee, presented these analyses. **(Exhibit D)**

**The summary below reflects the information presented at the March 17th meeting. However, a discrepancy was found after the meeting that required the analyses to be updated. Updated results will be summarized in a future Pancreas Transplantation Committee report.*

A common theme in feedback to the proposal for a national pancreas allocation system was the desire to give PAK candidates, particularly those who receive a living donor kidney transplant, priority over other types of pancreas transplant candidates in an effort to help alleviate the kidney shortage. However, the 5-

year outcomes for pancreas graft survival in PAK recipients is significantly worse than 5-year outcomes for pancreas graft survival in simultaneous pancreas-kidney (SPK) recipients. There are some single center studies that show similar long-term outcomes for pancreas graft survival in PAK and SPK recipients. The Committee is interested in learning what factors influence improved outcomes for PAK recipients. In October 2010, the Outcomes Subcommittee requested data on which donor and recipient factors are associated with patient and graft survival for PAK recipients.

The analyses assessed outcomes (5 years post-transplant) for patient, kidney graft, and pancreas graft survival. The analyses included PAK recipients from January 1, 2000 to December 31, 2004, defined as having received a kidney-only transplant prior to or on that date. Previous SPK recipients were excluded to simplify graft status follow-up (N=255). Recipients who did not have records with UNOS for their previous kidney transplant were excluded (N=19).

The final cohort was 1374 PAK recipients, followed for a maximum of five years. The average age at pancreas transplant was 42 (minimum =11, maximum=65). 86.3% of the recipients were white, 6.8% were black, 5.6% were Hispanic, and 1.2% were classified as other. 59% of PAK recipients were male. 96.8% of PAK recipients had a diagnosis of Type I diabetes, 2.5% had a diagnosis of Type II diabetes, and 0.7% had diagnosis unknown. 74.3% had onset of diabetes prior to age 21.

Cox proportional hazards models were used to model three outcomes: patient survival, pancreas graft survival, and kidney graft survival. The start of the observation time was at pancreas transplant. Unless a graft failure was specifically recorded, death was a censoring point and not a graft failure event. A return to insulin was not considered a pancreas graft failure.

Of the 1374 PAK recipients included in the model, 221 (16.1%) died before the end of follow-up, 147 (10.7%) patients were lost prior to the end of follow-up, and 1066 (73.22%) survived to the end of follow-up.

Of the 1374 PAK recipients included in the model, 138 (10.0%) experienced a pancreas graft failure prior to death; 11 (0.8%) had a reported pancreas graft failure on the date of death, and were also considered a graft failure, resulting in a total of 149 (10.8%) pancreas graft failures. 137 (10.0%) patients were lost to-follow-up. 134 (9.8%) patients died without a reported pancreas graft failure, and so were censored at death but not considered to have experienced a pancreas graft failure. 954 patients (69.4%) were followed to five years post-transplant without incident.

Of the 1374 PAK recipients included in the model, 91 (6.6%) experienced a kidney graft failure prior to death, and 7 (0.5%) had a reported kidney graft failure on the date of death, resulting in a total of 98 (7.1%) kidney graft failures. 143 (10.4%) patients were lost-to-follow-up. 155 (11.3%) patients died without a reported kidney graft failure, and so were censored at death but not considered to have experienced a graft failure. 978 patients (71.2%) were followed to five years post-transplant without incident. 5 patients (0.36%) experienced a kidney graft failure prior to the date of their pancreas transplant and so were not included in this model.

Table 1 shows the covariates examined for the models.

Table 1: Covariates Examined for the Patient, Pancreas Graft, and Kidney Graft Survival Models

Covariates examined, recipient specific	Covariates examined, kidney specific	Covariates examined, pancreas specific
Years of Renal Replacement Therapy	Kidney donor age, race, gender, BMI, donor type, creatinine, cold ischemic time of organ, COD=CVA	Pancreas donor age, race, gender, BMI, height, creatinine, hypertensive, diabetic, COD=CVA
Age at transplant	Recipient PRA, BMI at time of kidney transplant	Recipient PRA, BMI, age, creatinine at time of pancreas transplant
Race	Received dialysis in week after transplant	Change in PRA and BMI from kidney to pancreas transplants
Gender	Age at kidney transplant	Pancreas cold ischemic time
Years with Diabetes at Time of Pancreas Transplant	Primary insurance at kidney transplant	Primary insurance at pancreas transplant
Age at Diabetes Onset	Recipient functionality (Karnofsky score) at time of transplant	Functionality status (Karnofsky score) at time of transplant
PVD, CVD, and Angina diagnoses at listing for pancreas	Kidney failed prior to pancreas transplant	Time from kidney to pancreas transplant
Albumin level at pancreas listing	Immunosuppressants and induction agents used at kidney transplant	Immunosuppressants and induction agents used at pancreas transplant
Average daily insulin dosage prior to pancreas transplant (60.3% missing)		Pancreas duct management
Type of diabetes		Number of HLA mismatches with donor
		Geographic region
		Share type: local/regional/national
		Total volume at recipient's transplant center in year of transplant: total PAK, total PA, and overall total
		Drug-treated hypertension at time of transplant

If a covariate was significant or marginally significantly predictive of the outcome (approximately $p < 0.10$), it was retained in the model and then subjected to backwards selection. If the model fit worsened significantly (with a selection criteria of $p < 0.08$) with the covariate's exclusion, the covariate was retained. Otherwise, the covariate was removed. Table 2 shows the recipient and donor factors retained in the models.

Table 2: Recipient and Donor Factors Included in the Final Models

Recipient factors	Donor factors
Age	Pancreas donor creatinine
Years of Renal Replacement Therapy	Kidney donor creatinine
BMI at pancreas transplant	Pancreas donor BMI
HLA mismatches at pancreas transplant	Kidney cold ischemic time
Change in BMI from kidney to pancreas transplant	Cause of death = CVA
Creatinine at time of pancreas transplant	Share type for pancreas (local versus non-local)
Functional status (Karnofsky score) at time of kidney transplant	
Peripheral Vascular Disease (PVD)	
Sensitization at kidney transplant (PRA %)	
Induction used at pancreas transplant	
African-American race	
Insurance at PA transplant	
Transplant year	

Table 3 shows whether the covariates specifically requested by the subcommittee were significant in the final models.

Table 3: Impact of Subcommittee Requested Covariates on the Final Models

Requested Covariate	Impact
Time between kidney and pancreas transplants	Highly significant alone but not in fully adjusted model
Kidney Donor Type	Highly significant alone but not in fully adjusted model
Quality of renal allograft function at time of pancreas transplant	Creatinine highly significant in final model
Geographic region	Not significant
PDRI or its components	BMI, COD=CVA, and creatinine significant
Immunosuppression at time of pancreas transplant	Significant in final models
Share type	Local versus nonlocal share significant in final model
Sensitization	PRA at kidney transplant significant in final model
Transplant center's total pancreas, SPK, and PAK volumes	Not significant

The Committee discussed the problem of defining graft failure. Pancreas graft failure is a reported field, and transplant centers use different criteria to determine graft failure. The Committee noted that it could be helpful to clarify how to fill out the pancreas follow up forms so centers would report graft failure more consistently.

The Committee had several suggestions for the PAK analyses. First, the Committee suggested noting that the data was based on a cohort where everyone had reached 5 years of follow up. Second, the Committee requested that eGFR be used as a measure of kidney function rather than creatinine. Third, the Committee would like to run pancreas donor risk index (pDRI) in a univariate analysis. The Committee commented that living versus deceased donor were collinear with creatinine or GFR, so both covariates may not need to be included.

The Committee debated whether it would be reasonable to exclude early technical loss from the model because different factors impact early versus late graft failure. The Committee considered running early and late graft losses separately in a univariate analysis or separating early and late pancreas graft failure in the kidney graft failure model. The overall statistics would not improve with these analyses, but the analyses could show the impact of early technical loss.

The Committee considered whether the amount of time between kidney and pancreas transplant may be a factor in pancreas or kidney graft survival. The time variable may not capture what amount of time between kidney and pancreas transplant is too short. The Committee also considered whether clustering on center would show any impact, particularly relating to induction agents, but the numbers are too small to cluster on center.

The Committee inquired what the five-year survival would be for candidates who had the set of characteristics that the model showed to be positively correlated with increased survival. The Committee thought this information would be helpful to clinicians and could help inform them in which circumstances a PAK would have better outcomes.

Pancreas Program-Specific Reports Models

On its October 8, 2010 conference call, the subcommittee reviewed the purpose of their work on the pancreas program-specific report (PSR) outcomes models. In November 2006, the Membership and Professional Standards Committee (MPSC) asked the Committee to work with SRTR to consider the variables that could be included in a pancreas-alone outcomes model. At the time, only a kidney-pancreas model existed. In 2007, the Committee formed a subcommittee to investigate this model. As part of the process, the subcommittee considered and eventually recommended having a combined SPK/PAK/PTA model to increase the statistical power of the model by increasing the number of events. In January 2009, the subcommittee requested that the MPSC only use the 1-year patient survival model for evaluating pancreas programs and allow the Committee to continue to work on the 1-year graft failure model in order to raise the index of concordance. In April 2009, the MPSC agreed to give the Committee additional time to work on the 1 year graft failure model. On October 8, 2010, the Ann Arbor SRTR staff reviewed the work previously done on the combined SPK/PAK/PTA models. The subcommittee requested data on the number and percent of large volume pancreas transplant programs (performing more than 9 transplants in a 2.5 year period) that meet all of the following metrics using the combined SPK/PAK/PTA graft and patient survival models developed by the committee:

- Observed – Expected Events > 3
- Observed / Expected Events > 1.5
- One-sided p-value < 0.05

The cohort for 1-year outcomes was all pancreas transplant programs performing 10+ transplants between January 1, 2007 and June 30, 2009. Of 140 active pancreas programs, 92 were large-volume (performed 10+ transplants during 30-month interval). There were a total of 2980 transplants at large-volume centers. The cohort for 3-year outcomes was all pancreas transplant programs performing 10+ transplants between July 1, 2004 and December 31, 2006. Of 141 active pancreas programs, 94 were large-volume. There were a total of 3351 transplants at large-volume centers.

In the 1-year cohort, 48 patients did not have follow-up forms submitted, and in the 3-year cohort, 73 patients did not have follow-up forms submitted. These patients were not included in the models. In the 3-year cohort, 6/3278 (0.18%) were reported as lost to follow-up by the transplant center. In the 1-year cohort, 5/2932 (0.17%) were reported as lost to follow-up by the transplant center. These patients were included in the models, but censored at the date the "lost-to-follow-up" form was filed.

No centers in the 1-year cohort were dually flagged for both patient and graft survival. One center in each cohort was flagged for graft survival in both 1-year and 3-year follow-up. One center in the 3-year cohort was dually flagged for both patient and graft survival.

The Committee suggested using the Social Security Death Master File (SSDMF) data to supplement the information reported to the OPTN to improve the PSR models. The Committee commented that it would be interested in hearing about any revisions the new SRTR contractor would like to make to these models going forward. The Committee voted to send a recommendation to the MPSC that it use the combined SPK/PAK/PTA graft failure model to assess pancreas program performance. (15-Support, 0-Oppose, 0-Abstain)

Pancreas Outcomes Subcommittee minutes can be found in **Exhibit E**.

3. Retrospective Review of Waiting Time Cases

On March 17, 2011, Dixon B. Kaufman, MD, PhD, chair of the Committee, reviewed two waiting time modification requests received since the last full committee meeting. On December 17, 2010, the Committee chair and vice-chair reviewed an urgent waiting time transfer case. A candidate was listed for a whole pancreas on May 25, 2004. The candidate developed episodes of severe hypoglycemia resulting in life threatening hypoglycemic seizures and hospitalizations. As a result, the candidate's health was too fragile for a whole organ transplant, so the center requested that her waiting time be transferred to the pancreas islet list. This request was approved.

The subcommittee reviewed a waiting time modification request by e-mail on February 25, 2011 through March 2, 2011. The transplant center intended to list the candidate on May 5, 2010. The transplant center gave the data coordinator the listing information on May 5, 2010, but the coordinator resigned for personal reasons on May 7, 2010. As a result, the candidate was inadvertently not listed at that time. The transplant center discovered this error during a September 2010 appointment with the patient, at which time the center re-initiated the listing process. The transplant center requested that the pancreas waiting time be modified from a listing date of 12/16/2010 to 05/05/2010. The subcommittee voted to modify the candidate's waiting time on the pancreas list to begin on 05/05/2010. (6-Support, 0-Oppose, 0-Abstain)

The Committee voted to endorse the waiting time modifications. (14-Support, 0-Oppose, 0-Abstain)

Pancreas Waiting Time Subcommittee minutes and supporting documentation can be found in **Exhibit F**.

4. Update from the Pancreas for Technical Reasons Work Group

On October 29, 2010, Dr. Axelrod updated the Committee on the progress of the work group. Transplant centers and OPOs do not always agree on the appropriate disposition code (transplanted or not transplanted) for pancreata that are used for technical reasons as part of multi-organ transplants. Many of the pancreata used for technical reasons in multi-organ transplants are from infant donors; 61.5% of donors for liver-intestine-pancreas (LI-IN-PA) transplants are under the age of 5. On its previous call, the work group noted that pancreata from such young donors seem unlikely to be usable in whole pancreas transplants. The work group inquired whether it is possible to distinguish pancreata that could be used for whole organ pancreas transplant from those that are not likely to be used for that purpose and set a threshold for reporting purposes.

The work group recommends that pancreata recovered for technical reasons from a donor weighing less than 35 kg should be reported as not transplanted and pancreata recovered for technical reasons from a donor weighing more than 35 kg should be reported as transplanted. Pancreata from donors weighing less

than 35 kg account for less than 5% of the pancreata used for simultaneous pancreas-kidney (SPK) or pancreas-alone (PA) transplantation. OPOs are unlikely to be able to allocate these organs to an SPK or PA candidate because of the small size. Pancreata recovered for use in a PA or SPK transplant should continue to be reported as transplanted (if the organ is transplanted) regardless of the donor weight. The work group is now asking the Committees represented on the work group to review this recommendation.

Committee members were concerned that this recommendation does not account for cases where the pancreas is used to replace function as part of a multi-visceral transplant.

Pancreas for Technical Reasons Work Group minutes are attached as **Exhibit G**.

5. Update on Safeguard Measure for SPK Qualifying Criteria

On October 29, 2010, Elizabeth F. Sleeman, MHA, liaison to the Committee, updated the Committee on the revisions made to the proposal for an efficient, uniform allocation system made by the Pancreas Allocation Subcommittee after receiving additional comments from the Kidney Transplantation Committee. These revisions were communicated to the Committee by e-mail, and the purpose of this update was to give the Committee the opportunity to ask any clarifying questions about the revisions.

At its August 30, 2010 meeting, some members of the Kidney Transplantation Committee still had concerns about the SPK qualifying criteria that allows candidates on insulin with a c-peptide greater than 2 ng/mL and a BMI less than or equal to 30 kg/m^2 to accrue SPK waiting time. Some members of the Kidney Transplantation Committee remained concerned that the BMI threshold of 30 would cause a substantial increase in the number of SPK transplants. Members of the Kidney Transplantation Committee were not able to determine a BMI threshold that would permit access for candidates who have Type 2 diabetes that is phenotypically like Type 1 diabetes. Some on the Kidney Transplantation Committee remarked that they were reluctant to support the proposed BMI of 30 only because OPTN policy changes are very arduous to implement and require quite a bit of time. The concern is that if the number of SPK transplants for candidates with Type 2 diabetes balloons, the time required to remedy the situation through the policy development process will take years. The Kidney Transplantation Committee expressed interest in a contingency plan that would allow for the BMI threshold to be modified in real time based on the number of SPK transplants for candidates with Type 2 diabetes.

In order to address the Kidney Transplantation Committee's concerns, the Pancreas Allocation Subcommittee added the following safeguard measure to the proposal:

Safeguard measure: If the percentage of SPK candidates who qualify for SPK waiting time because they have a c-peptide value greater than 2 ng/mL and a BMI less than or equal to the maximum allowable BMI is above 15%, then the BMI threshold will drop by 2 kg/m^2. If the percentage of SPK candidates who qualify for SPK waiting because they have a c-peptide value greater than 2 ng/mL and a BMI less than or equal to the maximum allowable is below 10%, then the BMI threshold will increase by 2 kg/m^2. The BMI threshold cannot exceed 30 kg/m^2 even if the percentage of candidates on the SPK waiting list in this category is below 10%. The maximum allowable BMI upon implementation will be 28 kg/m^2. The OPTN contractor will check this percentage every six months and send a report to the Committee. The Committee or its designated subcommittee will review the report. If a change is indicated, the Committee will forward the report to the Executive Committee who will make the official determination that the BMI should be modified in accordance with policy. If no change is indicated, the Committee will document its review in its board report. If the Executive Committee determines that a change to the maximum allowable BMI is indicated, the OPTN contractor will change the BMI threshold as necessary within a short time frame (exact time frame is yet to be determined).

If a change to the BMI threshold were implemented, it would serve as an indicator that the Pancreas Transplantation Committee and other interested committees need to re-evaluate the qualifying criteria using the standard policy development process. This provision is intended to prevent abuse or gaming of the system in real-time so that the committees have time to properly evaluate the situation and propose alternatives.

Some Committee members expressed concern that this safeguard measure is not consistent with the goal of making the pancreas allocation system less complex. However, the Committee agreed that the safeguard measure was acceptable if it gained the necessary consensus for the proposal to be approved.

Pancreas Allocation Subcommittee minutes are attached as **Exhibit H**.

6. Update from the November 2010 Board Meeting, Status of the Proposal for an Efficient, Uniform Pancreas Allocation System, and Review of Regional Meeting Slides

On March 17, 2011, Dr. Kaufman updated the Committee on the November 2010 Board of Directors meeting. The Board of Directors approved the Committee's proposal for an efficient, uniform national pancreas allocation system. (30-Support, 0-Oppose, 0-Abstain) The Board also approved the Histocompatibility Committee's proposal to require that deceased donor HLA typing be performed by DNA methods and identify additional antigens for kidney, kidney-pancreas, pancreas, and pancreas islet offers. These proposals will not be implemented until after the Chrysalis system redesign project is completed.

The Committee will prepare for the implementation of its proposal by reviewing the existing pancreas and kidney-pancreas alternative allocation systems (AAS). The proposal stated:

> *If the proposed policy is implemented, current alternative allocation systems (AAS) will be eliminated. If a group with an existing AAS wishes to continue its AAS in the new pancreas allocation system, that group will have the opportunity to re-apply for the AAS. It is expected that any applicants will incorporate the following changes to the national system:*
>
> - *A combined SPK and PA match run;*
> - *SPK qualifying criteria;*
> - *Pancreas allocation disentangled from kidney allocation.*
>
> *All applications will be reviewed by the Pancreas Transplantation Committee using the requirements located in policy and in the OPTN Final Rule.*

Currently, three groups (MNOP, NCNC, and Tennessee statewide) have an existing pancreas or kidney-pancreas AASs. These groups are being contacted about the process for re-applying if they wish to continue their AAS. If any groups apply to continue their AAS, the Pancreas Allocation Subcommittee will do an initial review of any applications received and develop a recommendation for the full committee.

The Committee also reviewed the Pancreas Transplantation Committee update slides for the spring 2011 regional meetings. These slides provide an update on the approval of the proposal for an efficient, uniform national pancreas allocation system, review the process for applying to continue an existing pancreas or kidney-pancreas AAS, and inform the regions that training on the new pancreas allocation system will be provided closer to the implementation date.

7. Policy Oversight Committee Update

Dr. Axelrod, the Pancreas Transplantation Committee representative to the Policy Oversight Committee (POC), provided an update on POC activities. The POC was established under the OPTN contract which went into effect in October of 2005. The purpose of the POC is to:

- Support and improve the efficiency of the OPTN policy development and deliberative process. The POC established a plan for reviewing the OPTN policies, which included the development of a scorecard;
- Ensure that allocation policies meet certain performance-improvement standards;
- Support ongoing operation and improvement of data-collection systems; and
- Review proposed research projects to ensure continued understanding of organ donation and transplantation issues that will ultimately improve the performance of the national transplant system.

The POC goals for the 2010-2011 committee year are to:

- Continue to review Committee proposals and initiatives according to Committee's charge and criteria specified by leadership;
- Review multi-organ allocation policies; and
- Oversee ongoing policy rewrite project, including providing input regarding the clarity and quality of rewritten and reformatted policy language.

The Executive Committee has been charged with taking a more active role in monitoring the policy development process to:

- Ensure cost-effective use of committee time and policy development resources;
- Ensure that proposals achieve cost-effective improvement in allocation policy consistent with the Final Rule;
- Ensure key stakeholders are engaged early and often; and
- Ensure proposals are not out of date when implemented.

The POC will take on an advisory role to the Executive Committee in this process. The POC will perform the following tasks:

- Objective assessment of the proposal's potential to further the OPTN mission;
- Objective assessment of the anticipated impact on other OPTN policies;
- Identification of key stakeholders (within and outside the OPTN);
- Establish anticipated development, implementation, and maintenance costs; and
- Establish an estimated timeline for the proposal so, if approved, resources are in place to begin programming soon after Board approval.

The POC has also been reviewing multi-organ allocation policies. One theme is that there should be minimal listing criteria for multiple organ transplants.

8. Separate Notification for Islet Teams

On March 17, 2011, Committee members raised an issue about islet offers for centers that have separate whole pancreas and pancreas islet teams. DonorNet^{SM} has the capability for the OPO to send separate notifications to both the whole pancreas and pancreas islet teams. However, there has been at least one case where the OPO has only sent notification to the whole pancreas team even though islet offers were being made. Committee members were concerned that some OPOs may not be aware that some centers have two teams and that they should be sending notifications to both teams. This information is particularly relevant for import offers where the OPO may not be familiar with individual center arrangements. The Committee asked the Islet Subcommittee to develop an educational memo, which can be shared with the OPO Committee.

9. Public Comment and Opportunities for Comment

a. Proposal to Clarify which Transplant Program has Responsibility for Elements of the Living Donation Process and to Reassign Reporting Responsibility for Living Donation from the Recipient Transplant Program to the Transplant Program Performing the Living Donor Nephrectomy or Hepatectomy.

Living Donor Committee and Membership and Professional Standards Committee

The Committee considered this proposal on October 29, 2010. The intended goal of this policy is to protect the health of living organ donors by shifting the responsibility for living donor follow-up to the hospital that has an established relationship with the living donor. The proposal clarifies and, in some cases, changes which transplant program is responsible for the living donation process. Under this proposal, the transplant program that operates on the living donor will be responsible for the consent, medical and psychosocial evaluations, perioperative care, and required follow-up reporting for that donor. Additionally, the revisions require that OPTN member transplant hospitals only accept living donor organs from transplant programs that are approved by the OPTN for recovering that type of living donor organ.

The Committee discussed this proposal on October 29, 2010, and voted to support the proposal as written. (12-Support, 0-Oppose, 0-Abstain)

b. Proposal to Establish Qualifications for a Director of Liver Transplant Anesthesia in the OPTN Bylaws

Membership and Professional Standards Committee

The Committee considered this proposal on October 29, 2010. This proposal will protect patient safety by ensuring that all liver transplant programs employ an anesthetist who meets minimum experience and training requirements specific to transplantation. Transplant programs will be required to designate a Director of Liver Transplant Anesthesia with expertise in the area of perioperative care of liver transplant patients who could serve as an advisor to other members of the team. The new bylaw language will:

- Designate the appropriate board certification for the position;
- Delineate certain administrative and clinical responsibilities that should be handled by the director; and
- Determine the minimum qualifications needed for the position.

The Committee discussed this proposal on October 29, 2010, and voted to support the proposal as written. (12-Support, 0-Oppose, 0-Abstain). The Committee also noted that while pancreas transplantation does require high level anesthesia care, no additional requirements in the bylaws are necessary for pancreas transplant anesthesia.

c. Proposal to Modify the Requirements for Transplant Hospitals that Perform Living Donor Kidney Recoveries

Membership and Professional Standards Committee

The Committee considered this proposal on October 29, 2010. The goal of this proposal is to provide an additional means for open donor nephrectomy qualification now that laparoscopic nephrectomy is more commonplace than it was when this bylaw was originally adopted. The proposal recognizes surgeons who are qualified to perform laparoscopic living donor nephrectomies as qualified to perform open donor

nephrectomies as well. The revisions also eliminate the requirement for kidney transplant programs to be specifically designated to perform open donor nephrectomies since the majority of donor surgeries are performed laparoscopically.

The Committee discussed this proposal on October 29, 2010. The Committee suggested that the term minimally invasive be used rather than laparoscopic**.** The Committee further noted that the laparoscopic requirements may be too low for a primary surgeon and should re-evaluated for currency. The Committee voted to support the proposal as written. (12-Support, 0-Oppose, 0-Abstain)

d. Proposal to Prohibit Storage of Hepatitis C Antibody Positive and Hepatitis B Surface Antigen Positive Extra Vessels

Operations and Safety Committee

The Committee considered this proposal on October 29, 2010. The proposed addition of policy is meant to improve patient safety and recipient outcomes related to the storage and transplant of extra vessels. The Operations and Safety Committee is proposing revised policy language for Policy 5.10.2 (Vessel Storage) prohibiting the storage of Hepatitis C antibody positive and Hepatitis B surface antigen positive extra vessels. This proposal also includes modifications to Policy 5.10.1 requiring transplant centers to verify the donor extra vessels ABO, all serology results, container contents, date of expiration and the UNOS Donor ID with the ABO and all serology results of the intended recipient prior to implantation. This change is expected to reduce the risk of disease transmission from transplant of extra vessels into secondary recipients when the vessels are not transplanted into the recipient for whom the donor's organ was originally procured.

The Committee discussed this proposal on October 29, 2010. The Committee thought that the restriction from storing all Hepatitis C antibody positive and Hepatitis B surface antigen positive vessels was unwarranted based on a single case when so many other recipients have benefited from the storage and appropriate use of these vessels. The Committee did not support the proposal as written. (2-Support, 8-Oppose, 0-Abstain). However, the Committee did support the definition and time-out provisions of the proposal. (12-Support, 0-Oppose, 0-Abstain)

e. Concepts for Kidney Allocation

Kidney Transplantation Committee

The Committee considered this concept document on March 17, 2011. The Committee reviewed the concepts for kidney allocation released by the Kidney Transplantation Committee. These concepts can be divided into three main themes:

1. Utilizing a kidney donor profile index (KDPI) to better characterize donor kidneys and to provide additional clinical information for patients and providers to consider during the transplant evaluation process and organ offer process. The KPDI is a continuous scale for measuring kidney quality to estimate the potential function of a donated kidney if it were transplanted in to the average recipient.

2. Allocating the highest quality kidneys (KDPI 20% and below) to the candidates with the highest estimated post-transplant survival (EPTS). Such kidneys account for 20% of available kidneys at this time.

3. Allocating remaining kidneys (80%) such that candidates have highest priority who are within 15 years (older or younger) of the donor's age.

The Committee appreciated the opportunity to provide feedback. There was concern that the shift in high quality kidneys to younger candidates would result in these younger patients forgoing a living donor transplant. The Committee inquired how the Kidney Transplantation Committee accounted for immunologic risk and not just age. Committee members also asked why the Kidney Transplantation Committee chose 80% age matching rather than using 100% age matching. Committee members thought that the complexity of DPI may not provide enough benefit to be worthwhile compared with the ease of simple age matching. The Committee asked what the transition plan is for candidates who are currently on the waiting list.

The Committee discussed the provision in the proposal that would allow dialysis time to be backdated, but would not allow backdating to the time the candidate had a GFR of less than or equal to 20 mL/min. Some Committee members thought that waiting time should be based only on dialysis time. Some Committee members thought that waiting time should be backdated to the first date where the candidate had a test that showed a GFR of less than or equal to 20 mL/min as well. However, there was also concern that referral patterns could result in ethnic minority candidates having less waiting time because testing is not ordered as early in the disease progression or because they had been on dialysis longer.

The Committee noted that the problem of geography is not addressed in these concepts, and the Committee was concerned that no one was tackling an issue that could have such a large impact on organ utilization and transplantation.

f. Proposed Model for Assessing the Effectiveness of Individual OPOs in Key Measures of Organ Recovery and Utilization

Membership and Professional Standards Committee (MPSC) and Organ Procurement Organization (OPO) Committee

The Committee considered this proposal on March 17, 2011. The Organ Procurement Organization (OPO) Committee and the Membership and Professional Standards Committee (MPSC) propose the use of a statistical model to analyze OPO performance. This model utilizes a comparison of observed (actual) to expected organs transplanted per donor (yield) based upon donor specific characteristics in each Donation Service Area. The model will be used in aggregate (for all organs) in addition to organ specific performance measures, and predicts how many organs would have been recovered and transplanted if the OPO performed at the level of the national average for donors with similar characteristics. The MPSC will use the model to monitor OPO performance, similar to existing practices for monitoring transplant program performance. Through this approach, the MPSC will identify opportunities for improvement at OPOs whose observed organ yield falls below expected levels by more than a threshold. The bylaw proposal provides information regarding the model's intended use by the MSPC as well as the threshold that will result in MPSC inquiry.

The Committee inquired why the organs per donor metric is the chosen metric over other metrics such as donors per capita. The sponsoring committees believe that the data used to calculate the organs per donor metric are more reliable than the data needed for other metrics. Committee members believe that although the data may be better for the chosen metric, a metric related to the conversion rate of donors would be more beneficial to the system as a whole. The Committee was concerned that the risk tolerance of the surgeons using the organs in the donation service area (DSA) would impact the organs per donor metric and was not accounted for in the model. The Committee was concerned that the number of organs recovered per donor was not within the OPO's control and that this metric would result in a disincentive

to pursuing a donor who may only be able to donate a smaller number of organs. Committee members noted that some donation after cardiac death (DCD) donors could become brain death donors in high-functioning OPOs. Adjusting away the difference between cardiac death and brain death could miss a key performance metric. Committee members commented that they would like to see a statement of how the data used for these models are validated. There was also concern over how these models would be used by groups other than the MPSC. The MPSC cannot control how other groups use the data. The Committee suggested that the MPSC work to make these results protected under confidential medical peer review. Committee members commented that the OPO community is largely supportive of this proposal. The Committee voted to support the proposal. (7-Support, 3-Oppose, 3-Abstain)

g. Proposal to Require Confirmatory Subtype Testing of Non-A_1 and Non-A_1B Donors

Operations and Safety Committee

The Committee considered this proposal on March 17, 2011. This proposal would require confirmatory subtype testing of blood group A and AB deceased or living donors when sub-typing is used for the placement of organs, and the donor is identified to be subtype non-A1 (e.g A2) or non-A1B (e.g A2B). Blood samples for the initial and confirmatory subtype testing will be required to be taken on two separate occasions and be pre-transfusion specimens only.

This proposal would apply to both deceased and living donation. The Committee thought that several additional pieces of information are needed to make an informed decision about this proposal. What is the false positive rate for the test? How much does the additional sub-typing testing cost? What percentage of OPOs have already adopted a process for confirmatory sub-type testing? Committee members were also concerned about the pattern of making policy based on a single incident, especially if the additional requirements could reduce organ or vessel availability. The Committee supported the proposal in principle but does not support this proposal until there is more information on OPO adoption, potential practice pattern changes, and how much impact the additional testing could have on organ availability. The Committee did not support the proposal as written. (0-Support, 12-Oppose, 1-Abstain)

h. Proposal to Standardize Label Requirements for Vessel Storage and Vessel Transport

Organ Procurement Organization (OPO) Committee

The Committee considered this proposal on March 17, 2011. This proposed change makes the labeling requirements for vessel storage consistent with those for vessel transport. Recent Policy 5.0 changes eliminated the requirement that a label be placed directly on the vessel container for transport and require that the vessel label distributed by the OPTN contractor be attached to the outer barrier of the triple sterile barrier. Policy 5.10.2 currently requires the labeling of the vessel container when vessels are stored and requires the OPO to complete the labeling in the donor operating room. As such, there is an inconsistency in vessel labeling requirements. This proposed policy modification will not affect the labeling requirements for vessel transport and will clarify that containers for vessel storage do not require the vessel container itself to be labeled. The vessels must be placed in a triple sterile barrier, one of which is the rigid container, and labeled with the OPTN distributed label.

The Committee inquired whether the storage requirement would apply when the vessels are moving between operating rooms in a living donor transplant. The Committee voted to support the proposal. (12-Support, 0-Oppose, 0-Abstain)

i. Proposal to Update and Clarify Language in the DCD Model Elements

Organ Procurement Organization (OPO) and Organ Availability (OAC) Committees

The Committee considered this proposal on March 17, 2011. The proposed changes to the Donation after Cardiac Death (DCD) Model Elements will clarify and update language for the donation and transplantation community. These model elements identify specific requirements that OPOs and transplant centers must include in their DCD policies. As such, the name model elements has been changed to "Requirements." DCD is redefined as Donation after Circulatory Death (DCD) in order to accurately reflect the definition of death determined by cardio-pulmonary criteria. The committees also added the following language that mirrors the Centers for Medicare & Medicaid Services (CMS) requirements:

1) OPOs and transplant centers must establish protocols that define the roles and responsibilities of the OPO and the transplant center for all activities associated with the DCD donor, and;
2) OPOs must have a written agreement with Medicare and Medicaid participating hospitals and critical access hospitals in its service area that describes the responsibilities of both the OPO and hospital concerning DCD.

Additionally, other policies that have the terms "Donation after Cardiac Death" will have to be modified for consistency.

The Committee noted that even with the model elements, practice can vary across OPOs. Committee members thought that additional clarification would be helpful. The Committee requested that the OPO Committee clarify what constitutes declaration of death and specify whether the transplant team can be in the room during the waiting time following the declaration of death. The Committee voted to support the proposal. (11-Support, 1-Oppose, 0-Abstain)

10. Recognition of Outgoing Members

On March 17, 2011, Dr. Kaufman recognized the following Committee members with terms ending on June 30, 2011:

- James Markmann, MD, PhD- Region 1 Representative
- Stuart Geffner, MD- Region 2 Representative
- Rubin Zhang, MD, PhD- Region 3 Representative
- Jacqueline Lappin, MD- Region 4 Representative
- Horatio Rilo, MD- Region 5 Representative
- David Scott, MD- Region 6 Representative
- Mark Laftavi, MD, FACS- Region 9 Representative
- Jonathan Fridell, MD- Region 10 Representative
- Chris Chiarello- At Large Representative
- Albert Hwa, PhD- At Large Representative
- Christian Kuhr, MD- At Large Representative
- Rainer W. Gruessner, MD- Ex Officio
- David Axelrod, MD, MBA- Vice Chair

The Committee also recognized Dr. Kaufman's service as chair of the Committee.

Table 4: Pancreas Transplantation Committee Attendance

PANCREAS COMMITTEE		SEPTEMBER 1, 2010 - APRIL 30, 2011	
	MONTH	OCTOBER	MARCH
	DAY	29	17
	FORMAT	Live Meeting/ Teleconference	In Person
NAME	COMMITTEE POSITION		
Dixon Kaufman, MD, PhD	Chair		X
David Axelrod, MD, MBA	Vice Chair	X	X
James Markmann, MD, PhD	Regional Rep.	X	X
Stuart Geffner, MD	Regional Rep.	X	X
Rubin Zhang, MD, PhD	Regional Rep.		
Jacqueline Lappin, MD	Regional Rep.		by phone
Horatio Rilo, MD	Regional Rep.		X
David Scott, MD	Regional Rep.		by phone
Brian Flanagan, PhD	Regional Rep.	X	X
R. Brian Stevens, MD, PhD	Regional Rep.	X	X
Mark Laftavi, MD, FACS	Regional Rep.		
Jonathan Fridell, MD	Regional Rep.	X	X
Charles Bratton, MD	Regional Rep.	X	X
Nicole Beauvais, PA-C, MMS	At Large	X	X
Chris Chiarello	At Large	X	
Anissa Cole	At Large	X	X
Barry Friedman, RN, BSN, MBA, CPTC	At Large	X	X
Albert Hwa, PhD	At Large	X	
Christian Kuhr, MD	At Large		
Danielle Niedfeldt, JD, RN	At Large	X	X
Rainer W. Gruessner, MD	Ex. Officio		
James Bowman III, MD	Ex. Officio		by phone
Monica Lin, PhD	Ex. Officio		by phone
Ba Lin, MS, MPH	Ex Officio		by phone
Raja Kandaswamy, MD	SRTR Liaison	X	X
Peter Stock, MD, PhD	SRTR Liaison	X	
Sally Gustafson, MS	SRTR Liaison	X	X
Bertram Kasiske, MD, FACP	SRTR Liaison		by phone
Yi Peng, MS	SRTR Liaison		by phone
Jiannong Liu, PhD	SRTR Liaison		by phone
Elizabeth Sleeman, MHA	Committee Liaison	X	X
Jennifer Wainright, PhD	Support Staff	X	X
Kerrie Cobb	Support Staff	X	by phone
Kimberly Taylor, RN	Support Staff	X	
Lee Goodman	Support Staff		X