OPTN/UNOS Pancreas Transplantation Committee
Report to the Board of Directors
June 25-26, 2012
Richmond, VA

Summary

I. Action Items For Board Consideration

- None

II. Other Significant Issues

- The Pancreas Transplantation Committee reviewed two applications to continue variances under the new pancreas allocation system. The Committee decided not to continue either variance. (Item 1, page 3)

- The Pancreas Outcomes Subcommittee is investigating the donor and recipient factors that contribute to improved outcomes for pancreas-after-kidney (PAK) recipients. (Item 2, page 7)

- The Pancreas Transplantation Committee reviewed and supported revised models for pancreas program specific reports for use by the MPSC. (Item 3, page 16)

- The Islet Subcommittee is drafting a proposal to require that every islet infusion be reported to the OPTN Contractor within 24 hours of the islet infusion. (Item 6, page 23)

- The Pancreas Transplantation Committee reviewed and endorsed three pancreas waiting time transfer cases. (Item 7, page 25)

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David A. Axelrod, MD, MBA, Chair
Jonathan Fridell, MD, Vice Chair

This report includes items addressed by the Pancreas Transplantation Committee (the Committee) at its meetings held on October 20, 2011, October 26, 2011, January 27, 2012, and March 14, 2012.

1. Review of Pancreas Variance Applications

On October 26, 2011, Jonathan Fridell, MD, Chair of the Pancreas Allocation Subcommittee, presented two variance applications and the Pancreas Allocation Subcommittee's recommendations on these applications. As part of the recent pancreas allocation proposal, there was a provision that groups with existing variances would have the opportunity to apply to continue their variances under the new allocation system, provided that they met the requirements for a variance and were consistent with certain elements of the new pancreas allocation system. In the March 2011, the Committee notified all groups with existing kidney-pancreas (KP) or pancreas (PA) variances of the deadline for variance applications to be submitted. The deadline for application submission was May 2011. The Life Source Upper Midwest Organ Procurement Organization (MNOP) group chose not to apply to continue its variance **(Exhibit A)**. The MNOP variance will be dissolved when the new pancreas allocation system is implemented.

Both the Carolina Donor Services (NCNC) and Tennessee Statewide groups submitted applications to continue their variances. In July 2011, the Pancreas Allocation Subcommittee met to review variance applications for completeness. In August 2011, the subcommittee's feedback was provided to the applicants with the opportunity to submit revised applications by September 19, 2011. The subcommittee met again on October 6, 2011 to review the revised variance applications and develop recommendations for the full Committee.

According to Policy 3.4, the Committee must notify the applicants of its decision within 10 business days. If the applicant intends to appeal the decision, the applicant must notify the Committee in writing within 30 days of the Committee's communication of its decision. The Committee reviews only new information on the appeal. The applicant may participate in discussion. Then, the Policy Oversight Committee would review the appeal, and the Board would vote on the variance appeal.

The subcommittee reviewed each application for the following elements (the reference for each element is in parentheses):

a. Research design (Final Rule, Application)
b. Data collection plan (Final Rule, Policy, Application)
c. Analysis plan (Final Rule, Policy)
d. Time-limited/ defined endpoint (Final Rule, Policy, Application)
e. Indication of support or opposition from each OPO or transplant center that is to take part in the variance (Policy, Application)
f. If not unanimous, statements of support or opposition (Policy)
g. Statement of purpose, incorporating a review of the method for improving organ allocation or distribution (Policy)
h. How the system is intended to accomplish this purpose (Policy)

i. Why the current, national allocation system does not sufficiently address the needs of the transplant professionals or candidates that your organization serves (Application)
j. What is the target audience/population? (Application)
k. Predicted outcomes (Application)

Review of NCNC Application ***(Exhibit B)***
This variance allows candidates who are ABO identical and a 0 to 2 ABDR mismatch with the donor to have priority over KP candidates at the local level. All other local PA candidates come after the KP candidates on the match run. The rest of the allocation scheme is consistent with the old pancreas allocation system; there were no updates to make the variance consistent with the new pancreas allocation system as required in the pancreas allocation proposal. Four pancreas programs and one OPO voted in favor of the application. The NCNC applicants did not submit any additional or revised information based on the subcommittee's feedback in August 2011. Table 1 shows the Committee's assessment of the NCNC application for each variance criteria.

Table 1: Assessment of NCNC Pancreas Variance Application

Criteria	Reference	Notes
Research design	Final Rule, Application	Not included in detail
Data collection plan	Final Rule, Policy, Application	Included on page 2 of the application, but fields are not specific
Analysis plan	Final Rule, Policy	Not included
Time-limited/ defined end point	Final Rule, Policy, Application	Included on page 2 of the application
Indication of support or opposition from each OPO or transplant center that is to take part in the variance	Policy, Application	Ballots included. Four pancreas programs and one OPO voted in favor of the application. No one opposed the application.
If not unanimous, statements of support or opposition	Policy	N/A
Statement of purpose, incorporating a review of the method for improving organ allocation or distribution	Policy	Not present
how the system is intended to accomplish this purpose	Policy	Included in Attachment B but explanation is limited
Why the current, national allocation system does not sufficiently address the needs of the transplant professionals or candidates that your organization serves	Application	Included in Attachment C Application states anecdotal evidence is not sufficient.
What is the target audience/population?	Application	Included on page 2 of the application
Predicted outcomes	Application	Included on page 2 of the application

A combined SPK and PA match run	Pancreas proposal	In Attachment B of the application, but PA and KP candidates are sometimes in separate classifications. High CPRA statewide candidates follow 0MM high CPRA regional and national candidates (in national policy, high CPRA local candidates comes before 0MM high CPRA regional and national candidates). Differences for islet candidates based on donor type not noted.
SPK qualifying criteria	Pancreas proposal	Not included
Pancreas allocation disentangled from kidney allocation	Pancreas proposal	Not included

The subcommittee thought the application was not complete enough to be implemented. The subcommittee did not recommend that the full Committee approve this variance to continue under the new pancreas allocation system. The subcommittee vote to support continuing the variance was 0-Support, 7-Oppose, 0-Abstain. The Committee voted to support the subcommittee's recommendation not to continue the NCNC variance. (13-Support, 0- Oppose, 2-Abstain) Two Committee members from Region 11 abstained because their organizations could be impacted by the variance decision. The Committee did think that it would be worth investigating the impact of matching on solitary pancreas transplantation outside of the variance context.

Review of Tennessee Statewide Application ***(Exhibit C)***
This variance creates an alternative allocation system (AAS) by combining the two OPOs in the state into a single allocation unit. Two OPOs support the AAS. Two active pancreas programs and three inactive pancreas programs support the AAS. One active pancreas program opposes the AAS. The Tennessee Statewide applicants submitted a revised application that addressed all the recommendations. Table 2 shows the Committee's assessment of the Tennessee Statewide application for each variance criteria.

Table 2: Assessment of Tennessee Statewide Pancreas Variance Application

Criteria	Reference	Notes
Research design	Final Rule, Application	Included on page 2 of the application and Attachment E
Data collection plan	Final Rule, Policy, Application	Included on page 2 of the application and Attachment D
Analysis plan	Final Rule, Policy	Included on page 2 of the application and Attachment E
Time-limited/ defined end point	Final Rule, Policy, Application	Included on page 2 of the application and Attachment E
Indication of support or opposition from each OPO or transplant center that is to take part in the variance	Policy, Application	Ballots submitted. Two OPOs support the AAS. Two active pancreas programs and three inactive pancreas programs support the

		AAS. One active pancreas program opposes the AAS.
If not unanimous, statements of support or opposition	Policy	Statement provided.
Statement of purpose, incorporating a review of the method for improving organ allocation or distribution	Policy	Included on page 2 of Attachment C for
How the system is intended to accomplish this purpose	Policy	Included in Attachment B and Attachment C
Why the current, national allocation system does not sufficiently address the needs of the transplant professionals or candidates that your organization serves	Application	Included in page 1 of Attachment C How is item 1 (remove the disincentive for patients to pursue LRD kidney followed by PA) different from the national system?
What is the target audience/population?	Application	Included on page 2 of the application and Attachment E
Predicted outcomes	Application	Included on page 2 of the application and Attachment E
A combined SPK and PA match run	Pancreas proposal	Included on page 3 of Attachment B
SPK qualifying criteria	Pancreas proposal	Included on page 4 of Attachment B (same as the national system)
Pancreas allocation disentangled from kidney allocation	Pancreas proposal	Included on page 3 of Attachment B

The pancreas program who opposed continuing the variance under the new pancreas allocation system provided the following rationale:

1. "Our understanding of the new national pancreas allocation system is that it is essentially the same as TN AAS [Alternative Allocation System], i.e. pancreas allocated according to wait-time within blood group, kidney follows pancreas. This obviates the need to have a separate AAS.
2. As we have [learned] from our kidney AAS, there may be unintended, potentially adverse, consequences when one departs from a thoroughly vetted nationally approved system.
3. The new national system promotes wider, regional sharing, compared to current TN AAS."

The subcommittee noted that there is precedent, from the Liver and Intestinal Organ Transplantation Committee and the Board of Directors, for sharing in a unit smaller than the region and which is not broader sharing. There was also concern that one of three active programs opposed the variance. The subcommittee noted that addressing racial/ethnic disparities is important, but the variance would only address disparities within the state, not within the region which may have other OPOs with similar disparities. The subcommittee thought the OPO should have a prospective study of racial and ethnic disparities, in particular the impact of not having this variance in effect, and bring the results back to the Committee. The subcommittee voted to recommend that the full Committee not approve this variance to continue under the new pancreas allocation system. The subcommittee vote to support continuing the variance was 0-Support, 6-Oppose, 1-Abstain. The subcommittee member from Region 11 abstained from voting because his program could be affected by the variance.

The Committee noted that the state is currently a net exporter of pancreata, so it is not clear that the removal of the variance would negatively impact the ability for candidates in Tennessee to receive

pancreas offers. The Committee voted to support the subcommittee's recommendation not to continue the NCNC variance. (17-Support, 0- Oppose, 1-Abstain) One Committee member from region 11 abstained from voting because his organization could be impacted by the variance decision.

Pancreas Allocation Subcommittee Minutes can be found in **Exhibit D.**

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

Background on the data request

On October 26, 2011, David Axelrod, MD, MBA, Chair of the Committee, provided background on why the Committee is investigating PAK outcomes. Public comment for the proposal for a new pancreas allocation system included much feedback about having a combined list of SPK and PAK recipients. Two themes of the feedback were the desire for SPK candidates to have priority over all other types of pancreas candidates and the desire for PAK candidates who received a living donor kidney to have priority over all other types of pancreas candidates.

Whereas living donor kidney transplant outcomes may be superior to deceased donor kidney transplant outcomes for kidney-alone recipients, the case is more complicated for candidates who need both a kidney and a pancreas. For pancreas graft survival, the 1 year outcomes for SPK transplant (84.8%) and for PAK transplant (80.0%) are similar; but at 5 years, the outcomes for PAK (53.4%) are worse than SPK outcomes (73.4%). The kidney graft survival outcomes for SPK and PAK are similar at 1 year and 5 years (2009 OPTN/SRTR Annual Report, Table 1.13). Therefore, the data do not support a statement that a living donor kidney is a better option for candidates who also need a pancreas. There are some single center studies that show better outcomes for PAK recipients, but the improvements have not been shown at the national level to date.

As a result of this feedback from public comment, the Committee decided to investigate the factors that influence improved PAK outcomes at the national level. The Committee began reviewing these data at its March 17, 2011 meeting. On March 31, 2011, the subcommittee discussed the feedback from the March 17, 2011, Committee meeting and requested the following additional data:

- Continue analyses of donor and recipient factors that are associated with patient and graft survival for PAK recipients.
    - As an additional analysis, rerun/rebuild models using an expanded cohort of PAK recipients from 2000-2009.
    - Report average follow-up time when presenting Kaplan-Meier survival analyses.
    - Investigate use of PDRI, eGFR of recipient, donor type (living vs. deceased donor), and interaction terms in the models.
    - Compare methods of calculating graft failure. Examine all-cause graft failure.
    - Examine outcomes for PAK transplant with 'ideal' recipients and donors, showing estimated 5-year outcomes from the models for combinations of characteristics.

On October 26, 2011, SRTR staff presented an updated PAK analyses to the Committee incorporating the additional analyses requested in March 2011. The SRTR data analyses can be found in **Exhibit E**.

Methods

Study population

2349 PAK transplant recipients who underwent pancreas transplants between January 1, 2000, and December 31, 2009, were included. Only the first pancreas transplant during this period was considered. Additionally, 467 patients who had previously undergone SPK transplant (as opposed to kidney-alone transplant) were excluded from this analysis to simplify follow-up of the various graft statuses. Patients who were denoted as having undergone a previous kidney transplant but had no record of the transplant

were excluded. Multiple prior kidney transplants were possible; the most recent kidney transplant before the pancreas transplant was considered for the outcomes analysis.

Average pancreas donor risk index (pDRI) has decreased from 2000 to 2009 as has average cold ischemic time for pancreas transplant. The Committee thought this trend was related to transplant hospitals taking less risk with pancreata. The pressure to show better outcomes for PAK may have caused this change in behavior.

Analytical approach

The Cox proportional hazards model was used to model five outcomes in the PAK cohort: all-cause pancreas graft failure, death-censored pancreas graft failure, all-cause kidney graft failure, death-censored kidney graft failure, and patient death. Observation time for all models began at the time of the pancreas transplant. Multiple covariates were examined separately and together to best determine the predictors for each type of outcome. If a covariate by itself was not significantly predictive of the outcome (with a significance level of $P < 0.10$), it was not considered in the final multivariate model. Backwards selection was used to create the final model. If model fit worsened significantly (with a selection criterion of $P < 0.10$) with the covariate's exclusion, the covariate was retained. Otherwise, the covariate was removed. Appropriate functional form of each covariate was considered separately for each univariate and multivariate model. Linear, quadratic, cubic, and logarithmic parameterizations were variously tested to assess form. Furthermore, the proportional hazards assumption was assessed for all covariates included in the final model, and stratification was used to control for strong violations of this assumption. For a covariate to satisfy this assumption, the magnitude and direction of its effect cannot significantly vary during follow-up.

Table 3 shows a snapshot of the overall survival rate for all five outcomes examined.

Table 3: Survival Rates by Outcome

Outcome	1-year survival rate (95% CI) as percentages	5-year survival rate (95% CI) as percentages	10-year survival rate (95% CI) as percentages
All-cause pancreas graft failure	78.8 (77.1, 80.4)	56.5 (54.3, 58.8)	39.1 (24.7, 43.5)
Death-censored pancreas graft failure	81.9 (80.3, 83.4)	65.0 (62.8, 67.1)	51.1 (46.0, 56.1)
All-cause kidney graft failure	94.8 (93.8, 95.6)	75.8 (73.8, 77.7)	55.1 (50.7, 59.3)
Death-censored kidney graft failure	98.6 (98.0, 99.0)	86.7 (85.0, 88.3)	71.1 (66.3, 75.4)
Patient survival	96.0 (95.1, 96.7)	84.9 (83.3, 86.4)	67.9 (64.3, 71.2)

Results for the Pancreas Graft Failure Models

In this study, 2349 PAK patients were included. Of those, 997 (42.4%) experienced all-cause pancreas graft failure prior to September 30, 2010. Of those, 229 (9.7%) died prior to graft failure and 768 (32.7%) experienced graft failure prior to death. In addition, 15 patients (0.6%) were lost to follow-up and 1337 (56.9%) were followed to the censoring date without incident.

All-Cause Graft Failure

The average length of follow-up for patients with pancreas graft failure was 688 days (22.6 months), while the average length of follow-up for patients without pancreas graft failure was 1706 days (56 months). The index of concordance for this model was 61.3%, with a 95% confidence interval (CI) of 59.4-63.1%. Table 4 shows the covariates in the all-cause pancreas graft failure model and the related hazard for each covariate.

Table 4: Covariates in the All-Cause Pancreas Graft Failure Model

Covariate	Result
Kidney failure during follow-up, prior to pancreas failure or death	↑ hazard
PDRI, linear	↑ hazard as PDRI ↑
Age < 30	↑ hazard
CNI and mTOR use at pancreas transplant	↑ hazard if neither used or missing
Years between kidney and pancreas transplants	↑ hazard as time ↑
Recipient eGFR at pancreas transplant, quintiles	65-77, ↓ hazard versus others
Peripheral vascular disease (PVD)	↑ hazard if yes
Type 1 diabetes	↑ hazard if yes
Karnofsky score at pancreas transplant	↑ hazard if total assistance
Pancreas procured within OPO	↓ hazard
Pancreas donor eGFR	↓ hazard as eGFR ↑
Transplant year	↓ hazard as year ↑
Recipient BMI	↑ hazard for BMI >31 versus 20-31
Delayed Graft Function of Kidney	↑ hazard if yes

The Committee inquired at what time period between kidney and pancreas transplant the risk of graft failure increases. There is no specific inflection point. The increase in risk is linear. The Committee asked whether it is beneficial to perform a PAK in recipients who have a good GFR because of the reduction in diabetic complications. This question is not answered by the PAK analyses requested by the Committee, but other studies have shown improved kidney function five years after a PAK. The Committee asked whether any other immunosuppression factors were tested. The SRTR contractor did examine other immunosuppression factors, but those factors were not significant in the final model.

Table 5 shows the characteristics of sample low risk, medium risk, and high risk PAK candidates and their predicted outcomes using the all-cause pancreas graft failure model.

Table 5: Predicted Outcomes from the All-Cause Pancreas Graft Failure Model

Covariate	Person 1 low risk	Person 2 medium-risk	Person 3 high risk
PDRI, linear	0.80	1.0	1.5
Age	>30	>30	<30
Local pancreas	Yes	No	No
Years between kidney and pancreas transplants	1 year	2 years	3years
Calcineurin Inhibitor and mTOR use at pancreas transplant	Both	CNI only	mTOR only
eGFR at pancreas transplant	65.1-76.8	55.1-65	45.1-55
History of PVD	No	No	No
Delayed graft function of kidney	No	No	Yes
Year of pancreas transplant	2006	2006	2006
Pancreas donor eGFR	110	110	90
Karnofsky functional status	No limitations	No limitations	Some limitations
Diabetes type	Type 1	Type 1	Type 1
Estimated 5-year all-cause pancreas graft survival (95% CI)	68.6 (60,7, 77.5)	55.0 (49.9, 60.8)	29.3(14.8, 58.0)

Death-Censored Graft Failure

The average length of follow-up for patients with pancreas graft failure was 591 days (19.4 months), while the average length of follow-up for patients without pancreas graft failure was 1606 days (52.8 months). The index of concordance for this model was 61.7%, with a 95% confidence interval (CI) of 59.6-63.8%. Table 6 shows the covariates in the death-censored pancreas graft failure model and the related hazard for each covariate.

Table 6: Covariates in the Death-Censored Pancreas Graft Failure Model

Covariate	Result
Kidney failure during follow-up, prior to pancreas failure or death	↑ hazard
PDRI, linear	↑ hazard as PDRI ↑
Age at transplant, linear	↓ hazard as age ↑
CNI and mTOR use at pancreas transplant	↑ hazard if neither used, or missing
T-Cell depleting agent used at pancreas transplant	↓ hazard
Pancreas procured within OPO	↓ hazard
Recipient BMI	↑ hazard for BMI >31 versus 20-24
Type 1 diabetes	↑ hazard versus not-Type 1

Covariates dropped from the all-cause model include: recipient eGFR at pancreas transplant; PVD; Karnofsky score; year of pancreas transplant; pancreas donor eGFR; delayed graft function of kidney; and years between kidney and pancreas transplants.

Table 7 shows the characteristics of sample low risk, medium risk, and high risk PAK candidates and their predicted outcomes using the death-censored pancreas graft failure model.

Table 7: Predicted Outcomes from the Death-Censored Pancreas Graft Failure Model

Covariate	Person 1 low risk	Person 2 medium-risk	Person 3 high risk
PDRI, linear	0.80	1.0	1.5
Age	50	45	30
Local pancreas	Yes	No	No
Calcineurin Inhibitor or mTOR use at pancreas transplant	Both	CNI only	CNI only
Induction agent use	TCD	IL-2-RA only	None
Diabetes type	Type 1	Type 1	Type 1
Recipient BMI	≤ 24	24.1-28	>31
Estimated 5-year death-censored pancreas graft survival (95% CI)	80.8(76.2, 85.6)	64.6 (60.2, 69.4)	32.0 (22.5, 45.6)

Results for the Kidney Graft Failure Model

Of the 2349 PAK recipients included in the model, 591 (25.2%) experienced an all-cause kidney graft failure prior to September 30, 2010. Of these, 285 (12.1%) died without a reported graft failure and 306 (13.0%) experienced graft failure prior to death. In addition, 199 patients (8.5%) were lost to follow-up, and 1559 (66.4%) were followed to September 30, 2010 without incident. 4 of 591 (0.17%) experienced kidney graft failure before the date of the pancreas transplant and so were not included in this model.

All-Cause Graft Failure

The average length of follow-up for patients with kidney graft failure was 1193 days (39.2 months), while the average length of follow-up for patients without pancreas graft failure was 1804 days (59.3 months). The index of concordance for this model was 65%, with a 95% confidence interval (CI) of 62.6-67.1%. Due to nonproportionality of the hazard over time, the model was stratified by insurance type at pancreas transplant (private versus not private, 50.2% / 49.7%). Table 8 shows the covariates in the all-cause kidney graft failure model and the related hazard for each covariate.

Table 8: Covariates in the All-Cause Kidney Graft Failure Model

Covariate	Result
Recipient BMI	BMI <25 ↑ hazard versus 25-30
Kidney donor age	↑ hazard as age ↑
Recipient eGFR at pancreas transplant	<65 ↑ hazard
Kidney donor eGFR	↑ hazard if ≤ 75 or >115
Race	↓ hazard if Hispanic, ↑ hazard if African-American
Kidney donor type	↑ hazard if deceased
Pancreas failure during follow-up, preceding kidney failure or death	↑ hazard
Total HLA mismatches with kidney donor	↑ hazard if >1
Karnofsky score at pancreas transplant	↑ hazard if total assistance needed
BMI change from kidney to pancreas transplant	↑ hazard if gain >2 units of BMI or if change unknown
Kidney donor BMI	↑ hazard if BMI 35-40, versus 18-35, or >40
Kidney transplant was preemptive (versus >0 dialysis time)	↓ hazard

The Committee noted that the model is based on the kidney donor characteristics, which the pancreas surgeon cannot impact at the time of PAK. The Committee was interested in removing pancreas graft failure from the model and replacing it with pDRI because the transplant program can know pDRI at the time of pancreas offer. The pancreas program cannot know whether the graft will fail at the time of pancreas offer.

Table 9 shows the characteristics of sample low risk, medium risk, and high risk PAK candidates and their predicted outcomes using the all-cause kidney graft failure model.

Table 9: Predicted Outcomes from the All-Cause Kidney Graft Failure Model

Covariate	Person 1 low risk	Person 2 medium-risk	Person 3 high risk
Recipient BMI at pancreas transplant	25-30	>30	≤ 20
Recipient race	White	African-American	White
Kidney donor age	35	35	50
Karnofsky functional status at pancreas transplant	No limitations	No limitations	Some limitations
Recipient eGFR at pancreas transplant	65.1- 76.8	55.1-65	≤45
Kidney donor type	Living	Living	Deceased
Kidney donor eGFR	101.3- 113.9	101.3- 113.9	101.3- 113.9
Change in BMI from kidney to pancreas transplant	Change of <2 units	Change of <2 units	Gain of >2 units
Kidney donor BMI	18.1-35	18.1-35	<18
HLA mismatches with kidney donor	0-1	2-6	2-6
Insurance type at pancreas transplant	Private	Private	Private
Kidney transplant was preemptive (no dialysis)	Yes	No	No
Estimated 5-year all-cause kidney graft survival (95% CI)	93.0 (90.5, 95.5)	76.3 (67.8, 86.1)	43.9 (27.1, 71.1)

Death-Censored Graft Failure

The average length of follow-up for patients with death-censored kidney graft failure was 1358 days (44.6 months), while the average length of follow-up for patients without pancreas graft failure was 1694 days (55.7 months). The index of concordance for this model was 70.8 with a 95% confidence interval (CI) of 67.7-73.7%. Due to nonproportionality of the hazard over time, the model was stratified by insurance type at pancreas transplant (private versus not private, 50.2% / 49.7%). Table 10 shows the covariates in the death-censored kidney graft failure model and the related hazard for each covariate.

Table 10: Covariates in the Death-Censored Kidney Graft Failure Model

Covariate	Result
Recipient age, linear	↓ hazard as age ↑
Recipient BMI	BMI <25 or >30 ↑ hazard, versus 25-30
Kidney donor age, quadratic	↑ hazard as age ↑
Recipient eGFR at pancreas transplant	<65 ↑ hazard
Kidney donor eGFR	↑ hazard if ≤ 75 or >115
Race	↓ hazard if Hispanic, ↑ hazard if African-American
Kidney donor type	↑ hazard if deceased
Pancreas failure during follow-up, preceding kidney failure or death	↑ hazard
Total HLA mismatches with kidney donor	↑ hazard if 2-6
CNI and mTOR use at pancreas transplant	↓ hazard if CNI only versus both
eGFR post-kidney transplant	↓ hazard for >40, linear
Preemptive kidney transplant	↓ hazard

Covariates dropped from the all-cause model include: Karnofsky score; kidney donor BMI; and BMI change.

Table 11 shows the characteristics of sample low risk, medium risk, and high risk PAK candidates and their predicted outcomes using the death-censored kidney graft failure model.

Table 11: Predicted Outcomes from the Death-Censored Kidney Graft Failure Model

Covariate	Person 1 low risk	Person 2 medium-risk	Person 3 high risk
Recipient age at pancreas transplant	45	35	25
Recipient BMI at pancreas transplant	25-30	20-25	>30
Recipient race	White	African-American	White
Kidney donor age	35	45	50
Recipient eGFR at discharge, post-kidney transplant	80	55	35
Recipient eGFR at pancreas transplant	65.1- 76.8	55.1-65	45.1-55
Kidney donor type	Living	Deceased	Deceased
Kidney donor eGFR	101.3- 113.9	101.3- 113.9	101.3- 113.9
CNI and mTOR use at pancreas transplant	CNI only	mTOR only	Both
HLA mismatches with kidney donor	0-1	2-6	2-6
Insurance type at pancreas transplant	Private	Private	Public
Preemptive kidney transplant	Yes	No	No
Pancreas failed during follow-up	No	No	No
Estimated 5-year death-censored kidney graft survival (95% CI)	98.2 (97.2, 99.2)	80.0 (67.2, 95.2)	50.7 (34.6, 74.5)

Results for the Patient Survival Model

Of the 2349 PAK recipients included in the model, 442 (18.8%) died before the end of follow-up and the remaining 1907 (81.2) survived to the end of follow-up. The average length of follow-up for patients who died was 1337 days (43.9 months), while the average length of follow-up for patients who survived to the censoring date was 2163 days (71.1 months). The index of concordance for this model was 73.2%, with a 95% confidence interval (CI) of 70.6-75.8%. Table 12 shows the covariates in the patient survival failure model and the related hazard for each covariate.

Table 12: Covariates in the Patient Survival Model

Covariate	Result
Kidney or pancreas or both fail during follow-up	↑↑ hazard
Age at transplant, linear	↑ hazard as age ↑
Recipient BMI	BMI <20 ↑ hazard
Private insurance at pancreas transplant	↓hazard
Kidney donor age, linear	↑ hazard as age ↑
Recipient eGFR at pancreas transplant	<65 ↑ hazard
eGFR post-kidney transplant	↑ hazard if <30 or >90
Karnofsky score at kidney transplant	↑ hazard if total assistance needed
Pancreas donor BMI	lowest hazard if BMI 25-27
Pancreas donor eGFR	↓ hazard as eGFR ↑

Table 13 shows the characteristics of sample low risk, medium risk, and high risk PAK candidates and their predicted outcomes using the patient survival model.

Table 13: Predicted Outcomes from the Patient Survival Model

Covariate	Person 1 low risk	Person 2 medium-risk	Person 3 high risk
Age at pancreas transplant	30	45	55
Insurance type at pancreas transplants	Private	Private	Public or other
Recipient eGFR at pancreas transplant	65.1- 76.8	55.1-65	≤45
Recipient BMI at pancreas transplant	20.1-31	>31	≤20
Karnofsky functional status at kidney transplant	No limitations	Some limitations	Some limitations
Kidney donor age	35	45	60
Pancreas donor BMI	27.1-30	20.1-25	≤20
Pancreas donor eGFR	110	100	100
Recipient eGFR at discharge, post-kidney transplant	60-90	30-60	0-30
Kidney or pancreas failure during follow-up	No	No	No
Estimated 5-year patient survival (95% CI)	97.6 (96.5, 98.7)	90.5 (86.6, 94.6)	60.8 (47.3, 78.1)

Summary

Kidney graft failure had a strong negative association with subsequent pancreas graft failure; pancreas graft failure also had a significant negative association with subsequent kidney graft failure. Both effects were much stronger when the outcome was all-cause graft failure versus death-censored.

Kidney and pancreas graft failure were the definitive predictors of patient death. Though the magnitude of kidney failure's effect on death was much higher than that of the pancreas', a pancreas failure alone was a highly significant (P<0.0001) predictor of patient death.

For outcomes that included death, a low recipient BMI generally carried a high hazard; for death-censored graft failure, a low BMI was less detrimental and a high BMI became more hazardous. Immunosuppressant usage was not highly predictive of 10-year outcomes in contrast to a previous analysis; however, *missing* immunosuppression data was found to be highly hazardous. pDRI was highly predictive of pancreas outcomes but not kidney or patient survival. Cold ischemic time did not conform to clinical expectation with a marginally reduced hazard for <6 hours, but no differences among cold times between 6-30 hours. Kidney donor type was not predictive of pancreas outcomes. However, kidney graft failure was predictive of pancreas outcomes, and it is well-established here and elsewhere that kidney donor type is highly predictive of kidney outcomes. Young patients were at significantly higher risk of death-censored graft failure than older patients. The trend diminished for all-cause graft failure, and completely reversed for patient survival.

The Committee discussed the benefit of continuous glucose monitoring versus pancreas transplantation. Continuous glucose monitoring does not greatly improve events of hypoglycemic unawareness, but pancreas transplantation does.

The second request from the Committee was to calculate rates of kidney and pancreas graft loss, timing of loss, and causes of loss for recipients of PAK after living donor kidney transplant (PAK-LKD). The major causes of kidney graft loss were death (47.2% of graft failures) and chronic rejection (22.5% of graft failures). The rates were similar for recipients of PAK after deceased donor kidney transplant (PAK-DKD). The deaths for PAK-LKD were not in the early post-operative period. These data demonstrate that there is not a huge rate of peri-operative and post-operative death and that a PAK is a reasonable procedure. The early causes of graft failure were thrombosis, bleeding, and infection. Recipients of PAK-LKD had better survival of pancreas grafts than recipients of PAK-DKD.

The third request from the Committee was to tabulate the number of kidney transplant recipients per year waiting on the PAK list and transplanted off the PAK list, stratified by time between kidney transplant and listing on the PAK list, and kidney donor type. New listings are those who join the list in the index year. New PAK waiting list counts include only patients who were not already listed at a different center prior to the index year. Prevalent listings are those on the list on a particular day that year, December 31for this analysis. Prevalent listings include both "new" and "old" listings. From 2004 to 2010, the average time on the waiting list per year for new PAK candidates is steady at approximately 0.5 years whereas the time on the waiting list for prevalent but not new listing is increasing in that time frame from 2.7 years in 2004 to 4.0 years in 2010. The trend in the number of both new and prevalent listings has decreased from 2004 to 2010. The Committee noted that 2004 was the time when there were several publications questioning the efficacy of PAK, which may have contributed to the decrease in listings. Time to pancreas transplant is similar for LKD and DKD recipients. However, the time to pancreas transplant is much higher for prevalent listings than new listings. Additionally, the time to transplant has increased over time for both new and prevalent listings.

The Committee intends to develop a manuscript for publication on these analyses and will present the data at the American Transplant Congress.

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

3. Pancreas Program Specific Reports

On March 14, 2012, Sally Gustafson, MS and Peter Stock, MD, PhD, SRTR liaisons to the Committee, presented updated pancreas program-specific report (PSR) models to the Committee **(Exhibit G)**. Pancreas program outcomes are currently not formally reviewed by the MPSC. The PSRs contain observed outcomes for all pancreas transplant recipients, presented separately for SPK recipients. Expected outcomes are provided in the reports for SPK recipients only. The Pancreas Committee and MPSC have requested outcomes models to evaluate all pancreas transplants within a program (PTA (Pancreas Transplant Alone), PAK (Pancreas after Kidney), and SPK (Simultaneous Pancreas-Kidney) combined).

The selected approach for building these models is to:

- Build a predictive model within each pancreas transplant subtype (PTA, PAK, SPK).
- Predict expected events (graft failures and patient deaths) within each subtype.
- Pool the transplant subtypes within program, and compare total events (PTA, PAK, and SPK combined) to total predicted events using 3 PSR metrics.

An alternative approach would be to combine all transplant subtypes into one model and stratify based on subtype. This approach allows for an increased sample size, which increases the predictive power of the model. However, this stratified approach assumes that the covariates included in the model have a similar effect on the outcome across all transplant subtypes. The SRTR chose to build one model for each transplant type using an extended time window. A larger cohort allows greater precision in the estimated effects of the risk adjusters.

PSRs are generated every 6 months. They evaluate programs based on 2 separate cohorts, each 30 months (2.5 years) long. For model development, the SRTR doubled the cohort to be 5 years wide, but created a "period" variable that indicates if the transplant occurred in the first or second half of the 5-year time period. Model estimates were obtained from period 1 plus period 2 data. The "period" variable allows the model to estimate expected outcomes within periods 1 and 2 separately. Only period 2 data are used to evaluate programs.

For 1-year outcomes models, the cohort included all SPK, PAK, and PTA transplants performed between 7/1/2005 and 6/30/2010. Recipients transplanted prior to 1/1/2008 were designated as period 1; recipients transplanted on or after that date were period 2. For 3-year outcomes models, the cohort included all SPK, PAK, and PTA transplants performed between 1/1/2003 and 12/31/2007. Recipients transplanted prior to 7/1/2005 were designated as period 1; recipients transplanted on or after that date were period 2. All transplants were included in graft failure models; only primary transplants were included in patient survival models.

Table 14 provides the definition of the outcome being assessed for each model cohort. For the pancreas graft failure metric, the transplant program reports when the pancreas graft has failed. It is not based on a specific clinical metric such as c-peptide or insulin usage. Therefore, how pancreas graft failure is reported may vary across programs. When the MPSC begins using these models, a transplant program's outcomes could be affected by how the program reports pancreas graft failure.

Table 14: Outcomes Definitions

Cohort	Event	Followed Until Earliest Of:
1 year	**Graft failure**	Pancreas graft failure; pancreas re-transplant; patient death; 1-year post-transplant
1 year	**Patient death**	Patient death; 1-year post-transplant
3 year	**Graft failure**	Pancreas graft failure; pancreas re-transplant; patient death; 3-year post-transplant
3 year	**Patient death**	Patient death; 3-year post-transplant

Table 15 shows the observed survival rates for each outcomes model.

Table 15: Observed Survival Rates

Outcome	1-year survival rate	3-year survival rate
Cohort	Transplanted January 1, 2008 - June 30, 2010	Transplanted July 1, 2005 – December 31, 2007
Graft Survival		
SPK	87.9% (86.4, 89.2)	79.0% (77.3, 80.6)
PAK	81.4% (77.6, 84.6)	68.0% (64.4, 71.2)
PTA	77.7% (72.1, 82.2)	63.4% (57.4, 68.9)
Patient Survival		
SPK	96.0% (95.1, 96.8)	92.3% (91.1, 93.4)
PAK	95.4% (92.6, 97.2)	94.0% (91.5, 95.6)
PTA	96.5% (93.2, 98.3)	92.5% (88.3, 95.2)

Table 16 shows the c-statistic for each pancreas outcomes model. The c-statistic is the model's ability to correctly rank patients based on their estimated risk. A c-statistic of 0.50 is roughly equal to random guessing.

Table 16: C-statistics by Pancreas Outcomes Model

Model Type	C-statistic for Period 2	C-statistic for combined models, Period 2
1-year SPK GF	0.64 (0.60, 0.67)	0.65 (0.63, 0.68)
1-year PAK GF	0.64 (0.58, 0.69)	
1-year PTA GF	0.66 (0.61, 0.70)	
1-year SPK PS	0.65 (0.60, 0.71)	0.68 (0.63, 0.73)
1-year PAK PS	0.75 (0.62, 0.88)	
1-year PTA PS	0.78 (0.58, 0.98)	
3-year SPK GF	0.59 (0.56, 0.62)	0.62 (0.60, 0.64)
3-year PAK GF	0.61 (0.57, 0.64)	
3-year PTA GF	0.66 (0.61, 0.71)	
3-year SPK PS	0.65 (0.61, 0.69)	0.67 (0.63, 0.70)
3-year PAK PS	0.68 (0.59, 0.77)	
3-year PTA PS	0.76 (0.66, 0.86)	

Table 17 shows the c-statistics for outcomes models for other organs.

Table 17: Outcomes Model C-Statistics

Transplant Type	1-yr graft failure model: Average c-statistic	1-yr patient survival model: Average c-statistic
Kidney: Deceased Donor	66.1%	71.1%
Kidney: Living Donor	64.7%	75.0%
SPK: Kidney	59.2%	58.4%
SPK: Pancreas	58.6%	58.4%
Proposed Models	**1-yr combined graft failure model: C-statistic**	**1-yr combined patient survival model: C-statistic**
Pancreas	65.4%	68.2%

Calibration shows how well a model's predictions agree with reality across different levels of risk. Calibration is assessed by comparing number of events (graft failures/deaths) predicted by the model with the number observed in reality. Table 18 shows the calibration by decile of risk for the SPK, PAK, and PTA models.

Table 18: Calibration for Pancreas Outcomes Models

	SPK			PAK			PTA		
Decile of Risk	**N**	**Predicted Graft Failures**	**Observed Graft Failures**	**N**	**Predicted Graft Failures**	**Observed Graft Failures**	**N**	**Predicted Graft Failures**	**Observed Graft Failures**
1	209	13.49	12	50	3.31	4	26	2.82	3
2	210	16.43	17	51	5.09	8	26	3.54	1
3	210	18.60	9	51	6.55	3	27	3.89	4
4	209	19.50	26	50	7.17	8	26	4.29	5
5	210	21.77	20	51	8.03	9	27	4.94	5
6	210	23.55	26	51	9.75	6	26	5.40	7
7	209	26.0	21	50	10.28	9	27	5.98	4
8	210	28.28	33	51	11.50	14	26	7.15	7
9	210	32.99	36	51	13.17	17	27	7.49	10
10	209	53.41	54	50	19.14	16	26	13.49	13

The Committee asked whether a program could enter their patient data into these models to get a prediction of risk. These models cannot be used for that purpose. However, the pancreas donor risk index could be used for such a purpose. These models are cohort models and do not directly translate for risk assessment for individual patients.

1-Year SPK Graft Survival Model

Between January 1, 2008 and June 30, 2010, 2096 SPK transplants were performed. 87.9% of recipients (n=1842) were censored at one year post-transplant; 12.1% of recipients (n=254) experienced pancreas graft failure or died prior to the end of follow-up. Table 19 shows the covariates included in the 1-year SPK graft survival model with their associated hazard ratios and p-values.

Table 19: Covariates Included in the 1-year SPK Graft Survival Model

Covariate	Hazard Ratio	P-value
Pancreas Donor Risk Index, linear	1.65	<0.0001
Recipient BMI	<20: 0.81 20-25: 0.68 26-30: 0.71 30+: 1 (reference)	0.02
Cold ischemic time	0-6 hours: 0.65 6-10 hours: 0.62 10-15 hours: 0.74 15-20 hours: 0.75 >20 hours: 1 (reference)	0.01
Recipient race	Caucasian: 1 (reference) African-American: 1.1 Hispanic: 0.7 Other: 1.09	0.07
Hospitalization at transplant	2.7	<0.0001
Hospitalization in 90 days preceding transplant	1.5	0.01
CPRA/PRA, per 10 units	1.05	0.002
Recipient working for income prior to transplant	0.88	0.16
Age at diabetes diagnosis >35	1.08	0.04
Kidney received on ice versus pump	1.46	0.04

The c-statistic for the 1-year SPK graft survival model is 0.64 (95% CI = 0.60, 0.67).

Usually, missing variables were grouped with the "no" category for each covariate. Time on dialysis, previous transplantation, and eGFR at transplant did not have a statistically significant effect on graft survival in the SPK model. The Committee asked whether the dialysis covariate is co-linear with donor type (living vs. deceased). The Committee suggested dropping the race variable from the model because it may not be reliable. The Committee also noted that the statistical significance of the kidney received on ice versus pump may be a center effect. Additionally, such a covariate could be a result of technique, which should not be adjusted out of the model. The Committee also suggested that transplant programs be provided with the hazard ratio for each covariate so they can understand the importance of accurately reporting data, which allows these models to assess risk more accurately. The Committee wondered whether the hospitalization covariate was really a proxy for re-transplantation. There was also concern that the hospitalization status could be 'gameable', meaning that a program could base clinical decisions or reporting practices on the effect it would have on the program's PSRs. The Committee suggested using pancreas donor risk index (DRI) instead of individual factors in the PAK and PTA models.

1-Year PAK Graft Survival Model

Between January 1, 2008 and June 30, 2010, 504 PAK transplants were performed. 81.4% of recipients (n=410) were censored at one year post-transplant; 18.6% of recipients (n=94) experienced pancreas graft failure or died prior to the end of follow-up. Table 20 shows the covariates included in the 1-year PAK graft survival model with their associated hazard ratios and p-values.

Table 20: Covariates Included in the 1-year PAK Graft Survival Model

Covariate	Hazard Ratio	P-value
Recipient age. linear	0.97	0.0002
Donor age, linear	1.02	0.0005
Previous pancreas transplant	1.6	0.008
Female donor	0.68	0.01
Years of renal replacement therapy	0-10 years: 1.07 10-20 years: 0.67	0.05 0.07
Hospitalized in 90 days prior to transplant	1.6	0.01
HLA mismatches at kidney transplant	1.08	0.04
HLA-DR mismatches at pancreas transplant	0 mismatch: 0.69 1 mismatch: 1.33 2 mismatch: 1	0.01

The c-statistic for the 1-year PAK graft survival model is 0.64 (95% CI = 0.58, 0.69).

1-Year PTA Graft Survival Model
Between January 1, 2008 and June 30, 2010, 264 PTA transplants were performed. 77.7% of recipients (n=205) were censored at one year post-transplant; 22.3% of recipients (n=59) experienced pancreas graft failure or died prior to the end of follow-up. Table 21 shows the covariates included in the 1-year PTA graft survival model with their associated hazard ratios and p-values.

Table 21: Covariates Included in the 1-year PTA Graft Survival Model

Covariate	Hazard Ratio	P-value
Recipient age	< 40 years: 0.94 >40 years: 1.04	0.002 0.03
Recipient BMI	15-25: 0.92 >25: 1	0.06
Donor BMI	1.03	0.15
Previous pancreas transplants	0: 0.48 1: 1.00 2+: 3.72	<0.0001
Type 1 diabetes	0.61	0.13
Working for income prior to transplant	0.73	0.11

The c-statistic for the 1-year PTA graft survival model is 0.66 (95 % CI = 0.61, 0.71).

Large volume programs are defined as programs performing 10 or more transplants in 2.5 year period. The SRTR provides the analyses for 1-year post-transplant graft and patient outcomes. Programs must meet all three criteria below to be considered "flagged" as experiencing lower than expected outcomes:

- Observed – Expected Events > 3
- Observed/Expected Events >1.5
- One-Sided P-Value <0.05

An event is a graft failure or a death. The model serves as a trigger of inquiry or review but it is not the sole factor in decision-making.

Small volume programs are defined as programs performing 9 or fewer transplants in 2.5 year cohort. All small programs that experienced at least 1 event in the 2.5 year cohort are reported to the MPSC by the SRTR. UNOS Staff then review raw data in more recent years for each program. If an event occurred in the subsequent 6 months, the program will receive an MPSC inquiry.

The SRTR used the proposed models to determine flagging rates using a cohort of pancreas transplant recipients from January 1, 2008 to June 30, 2010. 133 programs performed at least one pancreas transplant during that time period. 88 large-volume programs (66.2%) performed 10 or more transplants; 45 small-volume programs (33.8%) performed 9 or fewer.

Of the 88 large-volume programs, 6 (6.8%) were flagged for 1-year graft survival; 0 were flagged for 1-year patient survival. Of the 45 small-volume programs, 26 (57.8%) had at least 1 graft failure and 8 (17.8%) had at least 1 patient death. Of these, 2 programs had 1 or more graft failures and/or deaths in the following 6 months and would be flagged by the MPSC for review. Currently, the rate of flagging for kidney programs is approximately 5%.

The Committee noted several additional covariates that might be helpful in the model, including prior abdominal surgery and presence of cardiac or vascular disease. However, the models are limited by what data are collected on the OPTN forms submitted by transplant programs. Currently, there are no clinical measures of cardiac or vascular disease on these forms (although symptomatic peripheral vascular disease is collected). The Committee inquired whether there were any interactions with center transplant volume and whether the timing of the previous transplant had an impact on outcomes. The Committee noted that the metrics the MPSC is using for flagging may not be the best way to assess program performance. The Committee also questioned what an appropriate flagging rate is.

The Committee was comfortable that this model is the best that can be achieved with the available data and that the model is adequate for the purpose of flagging larger volume programs for further inquiry. It is not sufficient, however, as a sole metric to assess pancreas transplant program performance. The Committee requested that its suggestions be investigated before presenting these models to the MPSC:

- Use pancreas DRI vs. components of pancreas DRI
- Investigate the impact of time between transplants for previous transplants
- Remove in-hospital at time of offer variable
- Investigate the interaction between donor type and years of ESRD
- Verify that previous abdominal (non-TX) surgery is not available

4. Definition of Pancreas Graft Failure

On March 14, 2012, the Committee discussed the need for a consistent definition of graft failure. Currently, transplant programs may use different criteria to determine when a pancreas graft has failed, particularly as it relates to the need for insulin. Some consider a pancreas as having failed if the patient has to take any insulin. Others only consider a pancreas as having failed if the patient has any hypoglycemic unawareness. Committee members reported that patients view the success of the transplant differently too. In the past, the Committee tried to develop a definition of pancreas graft failure. The definition had five varying levels of function. The Committee considered whether there should be a grade between full graft function and full graft failure. The Committee also questioned how to handle recipients who later develop type 2 diabetes. The Committee agreed that the best solution would be to collect clinical values such as c-peptide, insulin usage, and HbA1c. Then, graft failure could be defined based on these values rather than expecting transplant programs to report graft failure according to a specific definition. The Committee also thought it would be helpful to get input from endocrinologists on this

issue. The Committee formed a subcommittee to develop a draft definition for the next full Committee meeting.

5. Referral from the Membership and Professional Standards Committee (MPSC) on Pancreas Program Functional Activity and Plan for Reviewing Pancreas Bylaws

On October 26, 2011, the Committee considered a referral from the MPSC. The MPSC's Performance Analysis and Improvement Subcommittee (PAIS) conducts routine reviews of all transplant programs' performance by monitoring program outcomes and activity levels. All kidney, liver, heart, lung, and pancreas programs that do not perform a transplant during a specified time period are considered to be "functionally inactive." Pancreas programs are expected to perform at least one pancreas (including kidney/pancreas) transplant every six months. The majority of programs reviewed for inactivity are pancreas programs, and many of these programs have been reviewed for multiple periods of inactivity.

On behalf of the MPSC, the PAIS requested that the Committee consider modifying the pancreas functional inactivity threshold and provide the MPSC with a summary of the final outcome of the discussions. The PAIS has expressed concerns on several occasions that this level of activity seems too low for a program to remain current both with surgical skills and programmatic administrative competence. With these current activity levels, the PAIS cannot recommend voluntary inactivation, for instance, for these programs experiencing multiple periods of inactivity.

The Committee tasked the Pancreas Outcomes Subcommittee with requesting the necessary data to evaluate this situation and with drafting a response to the MPSC. The Committee requested that the bylaws relating to pancreas programs be provided to the Committee. Among the data collected will be the impact of program closure on access to transplant, number of candidates listed for transplant at centers not performing pancreas transplants, and the impact of recent changes in the kidney payback system that facilitate SPK transplant.

On March 14, 2012, the Committee discussed the ongoing project to review the bylaws relating to pancreas transplant programs, including both functional inactivity and key personnel requirements for primary pancreas and islet surgeon and physicians. Data on pancreas functional inactivity will be available in the next month. The goal is to have subcommittee recommendations ready for fall full Committee meeting with recommendations sent to the MPSC in the late fall/ winter 2012. The Committee noted that the relative transplant rate is important when considering functional inactivity. If a transplant program is transplanting its patients quickly, then the volume may be less of a concern. The Committee thought the more significant problem might be whether pancreas transplants are not being done even if there are reasonable pancreas offers or if waiting times are long. Some transplant programs have difficulty receiving insurance contracts but serve the patients who are on their list well. This situation is not the same as a transplant program that does not truly intend to do pancreas transplants. The Committee also noted that there is a difference in intent to transplant based on whether the transplant program turns down an offer by phone or after seeing the pancreas in the operating room. The Committee tasked the Allocation Subcommittee with continuing the work on this project.

6. Islet Subcommittee Update

On October 26, 2011, Ty Dunn, MD, chair of the Islet Subcommittee, provided an update on the Islet Subcommittee. In January 2011, the subcommittee conducted a survey of program directors of active and inactive pancreas islet transplant programs in the US to investigate barriers to pancreas islet procurement and placement. Islet transplant activity in the US contracted dramatically from 2002 to 2008. The 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. 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 Islet Subcommittee is also considering how to track every islet infusion in the OPTN database. Currently, islet infusions are not being reported to the OPTN. Potential solutions include requiring centers to remove a candidate from the pancreas list after each infusion (this option is already programmed but not required) or having islet programs submit logs that include basic information about each islet infusion performed including recipient outcome data as is required for solid organ transplantation.. Policies and bylaws about islet reporting need to be updated based on how the data will be collected. The subcommittee will work on a public comment proposal to require reporting of each infusion and clean up policy and bylaw language.

The Committee also discussed the lack of follow-up forms for pancreas islet infusions. In the past, the Committee had identified several barriers to creating islet follow-up forms. First, there were concerns about how to program islet follow-up forms if islets from multiple donors were infused into a candidate at the same time. Second, the federal government funds another group, the Collaborative Islet Transplant Registry (CITR), to collect data on islet outcomes. Third, if there are multiple infusions for a candidate, it may be difficult to determine which infusion the follow-up forms cover. However, the Committee strongly believes that this issue warrants further investigation prior to considering the relative position of pancreas allocation for islets compared to whole organ transplant.

On March 14, 2012, UNOS staff updated the Committee on the Islet Subcommittee's progress on revisions to islet policy to require the reporting of every islet infusion to the OPTN Contractor. Currently, islet policy allows an islet candidate to retain waiting time through three infusions. The purpose of allowing the candidate to maintain waiting time was to allow a candidate to have an opportunity to receive enough islets under a single course of induction. Thus, the transplant program only has to remove the candidate from the waiting list after the third islet infusion. The bylaws require that each transplant program submit islet logs accounting for every pancreas accepted for islets at the program, but these logs have never been collected. As a result, the OPTN does not have an official avenue for tracking every islet infusion.

UNOS staff presented the process for removing and automatically relisting an islet candidate to the Committee. When a transplant program removes a pancreas islet (PI) candidate, there is a question asking "Re-List Candidate?" if the number of islet infusions for that candidate's registration is less than three. If the transplant program selects "Yes", then the candidate is added back to the PI waiting list and retains the same waiting time the candidate had upon removal. Therefore, a solution is already programmed that would allow a transplant program to remove a candidate from the PI list after each infusion but still allow the candidate to retain waiting time through three infusions.

The Committee considered the following potential revisions to islet policies and bylaws:

- Require reporting to the OPTN contractor within 24 hours of each infusion (but still allow waiting time to accrue up to three infusions);
- Clarify whether it is three infusions total or three infusions at the program/ registration; and
- Remove bylaw language about islet logs.

The Committee's goal is to have a proposal out for public comment in the fall 2012 public comment cycle. UNOS staff will draft policy and bylaw revisions for the Islet Subcommittee to review. Then, the full Committee would vote on the final language in June or July of 2012.

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

7. Retrospective Review of Waiting Time Cases

On October 26, 2011, Joseph Magliocca, MD, chair of the Pancreas Waiting Time Subcommittee updated the Committee on the waiting time transfer cases considered since the March 2011 meeting. There were three candidates who requested a transfer of waiting time between pancreas alone (PA) and pancreas islet (PI) registrations. According to Policy 3.8.2.1 (Waiting Time Transfer for Whole Pancreas and Pancreatic Islet Cell Candidates), any transfer of waiting time between PA and PI registrations require approval by the Committee.

The subcommittee reviewed a waiting time modification request by e-mail on July 21, 2011 through July 26, 2011. A candidate was listed for PA on 05/25/2004. The listing was changed to PI on 12/16/2010. The patient has since become ineligible for PI under the center's clinical trial protocol. The center changed the listing back to PA and requested a waiting time transfer so that the PA waiting time begins on 05/25/2004. The subcommittee voted to modify the candidate's waiting time on the pancreas list to begin on 05/25/2004. (3-Support, 0-Oppose, 0-Abstain)

The subcommittee reviewed two waiting time modification requests by e-mail on October 7, 2011 through October 12, 2011. In both cases, the candidates requested that their waiting time from the PA registration at one center be transferred to a PI registration at another center. The subcommittee voted to approve the transfer of waiting time for the candidate in case 1 (7-Support, 0-Oppose, 0-Abstain) and for the candidate in case 2 (6-Support, 1-Oppose, 0-Abstain).

The Committee voted to endorse the Pancreas Waiting Time Subcommittee's decisions. (16-Support, 0-Oppose, 0-Abstain)

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

8. Pancreas for Technical Reasons Work Group Update

On March 14, 2012, Dr. Axelrod reviewed the recommendations from the Pancreas for Technical Reasons Work Group. Surgical procedure for the procurement of organs for a multiple organ transplant often includes the procurement of the pancreas regardless of whether the candidate has diabetes or pancreatic deficiency. Therefore, there are some circumstances where a candidate may need a pancreas to facilitate a multiple organ transplant. Transplant programs are procuring the pancreas for technical reasons as part of a multivisceral transplant. The transplant program is then reporting the organ as not being transplanted. The OPO, on the other hand, is reporting the organ as transplanted. Therefore, the data in the UNOS database do not match because there is no recipient removal for transplant to match the donor disposition stating that the pancreas is transplanted. Transplant programs and OPOs are in disagreement as to whether the pancreas was transplanted. The data need to match, and UNOS staff can create ways for the pancreas to be reported by the OPO and the transplant program as "for technical reasons." However, this removal code for candidates and disposition code for donors must appear either under the set of codes for organs that are transplanted or under the set of codes for organs that are not transplanted. Having the codes in both places will lead to more data errors. Clarification of whether a pancreas procured for technical reasons as part of a multiple organ transplant should be classified as a transplant in the OPTN database is needed.

Please note that this decision does not directly affect how transplant programs will be charged for these organs. CMS determines cost accounting methods for the pancreas independent of any changes to OPTN policy. Additionally, because candidates already receive the pancreas for technical reasons as part of a

multivisceral transplant, OPOs already have methods for accounting for the pancreas in these circumstances.

A work group with representation from multiple committees discussed this topic and developed both a programming and non-programming solution that would align the data reported by the transplant program and the OPO. The non-programming solution is:

- 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 recovered for use in a pancreas-alone or SPK transplant should continue to be reported as transplanted (if the organ is transplanted) regardless of the donor weight.

The programming solution would allow OPOs to enter the organ disposition as transplanted for technical reasons and would allow transplant programs to remove the candidate as transplanted for technical reasons. This removal code would not generate pancreas follow-up forms. To use this method, the Committee would also need to define pancreas for technical reasons in policy. In order for UNOS staff to draft such policy language, UNOS staff requested clarification on the different ways a pancreas is used for technical reasons. UNOS staff suggested sending a memo to programs that have done 3 or more pancreata for technical reasons asking them what they do with the pancreas and requested that Committee or a subcommittee help to develop specific questions for this memo.

The Committee thought that the programming solution was a reasonable interim step. The Committee thought that a better approach to this issue would be to define these transplants using standard terminology rather than the term "for technical reasons." For example, the terms "multivisceral" (liver, pancreas, and intestine with or without stomach) and "modified multivisceral" (intestine and pancreas with or without stomach) are commonly used. Other definitions differ based on how the pancreas is used. A standard terminology would need to be developed and defined. Treating the cluster of organs as a bloc rather than as individual organs could solve many of the problems relating to multivisceral allocation and reporting. Additionally, the Committee thought these transplants should be treated as a bloc for reporting purposes instead of trying to decide what should be reported for each organ in the bloc. Committee members volunteered to work with UNOS staff to develop a path forward on this issue that could then be presented to other Committees involved in multivisceral transplantation.

9. Pancreas Allocation Policy Questions

On March 14, 2012, a Committee member requested clarification on two pancreas allocation questions. There was a situation where a blood type B candidate was listed for both a kidney and an SPK. The candidate received an offer for the kidney but did not appear on the SPK match run because the donor's blood type was O. Kidney policy allows blood type B candidates who are a zero mismatch with the donor to receive blood type O kidney offers. However, pancreas policy only allows blood type O SPK candidates to receive blood type O kidney-pancreas offers. Blood type B pancreas-alone candidates can receive blood type O pancreas offers. Therefore, this candidate was eligible to receive blood type O kidney and pancreas offers but not blood type O SPK offers. The Committee agreed that the intent was to be consistent in how the kidney is allocated and that kidney and pancreas allocation policy should be consistent. The Committee would like to correct this inconsistency in policy. The Committee tasked Allocation Subcommittee with looking into this issue further.

The second situation is that there was a local donor with a common HLA, which resulted in a number of candidates appearing in the zero mismatch classifications. An offer went to a regional zero mismatch candidate with a CPRA greater than 80% rather than the local candidate who was a zero mismatch but

had a CPRA less than 80%. The Committee was comfortable with these allocation rules because the priority is designed to improve access for highly sensitized candidates.

10. Kidney Transplantation Committee Update

On October 26, 2011 and March 14, 2012, Richard Formica, MD, vice-chair of the Kidney Transplantation Committee (Kidney Committee), provided an update on the Kidney Committee's progress toward a new kidney allocation system. The current working model for a new kidney allocation system includes the following elements:

- The top 20% kidney donor profile index (KDPI or DPI) kidneys will be allocated to the candidates with the top 20% estimated post transplant survival (EPTS).
- Kidneys with a DPI from 20% to 85% will be allocated under the current rules with a few minor changes.
- Kidneys with a DPI between 85% and 100% will be allocated to candidates who opt-in to receive offers these kidneys.

All of these classifications will come after multi-organ, pediatric, and zero mismatch candidate classifications.

The Kidney Committee received feedback in response to the concept document that there is general agreement with longevity matching for some kidneys and support for use of KDPI as a clinical tool and in allocation. However, there were also concerns over use of age matching (+/-15 years). As a result, the Kidney Committee decided not to move forward with age matching. The Kidney Committee plans to move forward with a proposal that incorporates the following elements:

- Using longevity matching for top 20% of donor kidneys;
- Applying the A_2/A_2B committee-sponsored alternative system nationally;
- Incorporating ESRD time in addition to waiting time
- Using KDPI as an allocation tool;
- Creating a sliding scale for CPRA points;
- Allowing expedited placement for high KDPI kidneys; and
- Promoting broader sharing for the most highly sensitized candidates (CPRA >=98%).

Table 22 shows the Kidney Committee's assessment of the limitations of the current kidney allocation system and the concepts the Kidney Committee is considering to address these system limitations.

Table 22: Limitations of Current Kidney Allocation System

Stated Limitation of the Current System	Applicable Concepts
Mismatch between potential survival of the kidney and the recipient	Longevity matching
Variability in access to transplantation by blood group and geographic location	A2/A2B, broader sharing
High discard rates of kidneys that could benefit candidates on the waiting list	KDPI, expedited placement,
Reduce differences in transplant access for populations described in NOTA (e.g., candidates from racial/ethnic minority groups, pediatric candidates, and sensitized candidates).	ESRD time, broader sharing, CPRA sliding scale, maintain peds priority

The Kidney Committee believes that allocation based on longevity matching is accepted and sustains legal scrutiny. The majority of kidneys would still be allocated very similarly to current rules. Waiting time remains the primary determinant of kidney allocation with a more inclusive definition. The proposal improves upon the "ECD" system to address the concerns of older recipients. The "opt in" nature of the system preserves choice. It allows the trade off of a kidney with more longevity for more rapid transplantation. Additionally, regional allocation might improve recovery and placement. Finally, allocation on waiting time alone makes the opt-in system predictable and allows for list management.

On October 26, 2012, the Pancreas Transplantation Committee asked whether the top 20% would be in the local unit, across the region, or nationally. Those options are being modeled. Additionally, the Kidney Committee is still considering whether candidates remain in the top 20% once they reach the top 20% or if it is the top 20% of candidates at the time of the match. The Committee was concerned about the impact this policy could have on living donation for younger candidates. Dr. Formica explained that the Kidney Committee expects waiting time to remain similar because even the top 20% will not have access to all of the kidneys. Some Committee members were concerned that this policy would give priority to the younger candidates who often are less likely to be compliant or to have insurance. The Committee also thought candidates who were at high risk for waiting list mortality because they are on immunosuppression should qualify for the top 20%, including those who have previously undergone pancreas or liver transplantation and now have significant reductions in renal function. Committee members recommended defining the top 20% at the regional level with matches between a candidate and donor in the same local unit receiving more points to reduce cold ischemic time. The Committee inquired whether list exchange will be included in the new kidney allocation system. Some arguments have been made that list exchange disadvantages blood type O candidates, and the Kidney Committee's plan is currently not to include list exchange.

As of March 14, 2012, the Kidney Committee is currently awaiting final simulation modeling of:

- Sharing for candidates with CPRA>=98%
- Regional sharing of ECD kidneys

The earliest that a proposal could be released for public comment is fall 2012 with earliest Board consideration in June 2013.

The Committee inquired again how the Kidney Committee plans to determine the top 20% DPI kidneys. The Kidney Committee continues to discuss this issue. The top 20% DPI kidneys will likely be determined based on data on the national top 20% DPI kidneys each year. Then, the top 20% EPTS candidates will likely be determined quarterly. The Committee also asked how waiting time will be calculated. Waiting time will begin at the earlier of dialysis initiation date or listing with a GFR less than or equal to 20 mL/min. The Committee asked whether a top 20% DPI kidney will be allocated to local bottom 80% EPTS candidates before being offered to regional top 20% EPTS candidates. Kidneys will be allocated through all local candidates before being offered to any regional candidates.

The Committee inquired whether candidates must be unsensitized to opt-in to the "improved ECD" system. The Kidney Committee does not plan to prevent sensitized candidates from participating in the opt-in "improved ECD" system. The Committee was concerned that allowing sensitized candidates to participate could reduce the predictability of that part of the system, which is one of its advantages. The Committee also wondered how effective the system would be if everyone opted in and asked if there would be any restrictions on participation. The Kidney Committee has not considered any restrictions on participation.

The Committee recommended that the Kidney Committee consider allowing candidates to keep a peak CPRA value for a certain period of time after desensitization so that they could still receive the same

priority for offers in the short window where they could accept more offers due to the desensitization procedure. The Committee also noted that list exchange no longer will exist in the new kidney allocation system. The Kidney Committee was concerned that list exchange disproportionately affected blood type O waiting list candidates and thinks that kidney paired donation is a better option for incompatible pairs.

Variance Review
On October 26, 2011, Dr. Formica reported that the Kidney Committee has reviewed all existing kidney variances and identified those that it believes could be beneficial if implemented as part of a national kidney allocation policy. The Kidney Committee has sent letters to each OPO regarding the Kidney Committee's recommendations on whether the variance will be included in national kidney allocation policy. OPOs that wish to propose that its variance be reconsidered for national allocation policy will be asked to submit a brief rationale. OPOs involved in alternative local units or sharing arrangements who wish to maintain variances due to unique geographical constraints will be asked to submit a rationale as well. The Committee will review any responses to its letters before making final recommendations to the Board of Directors either to incorporate the variance into national kidney allocation policy, to acknowledge that the OPO has a permanent need for an alternative arrangement and to codify this variance in policy, or to discontinue the variance.

On March 14, 2012, Dr. Formica updated the Committee on the Kidney Committee's review of kidney variances. The Kidney Committee has reviewed all existing kidney variances and identified those that it believes could be beneficial if implemented as part of a national kidney allocation policy. The Committee decided to recommend discontinuation of all variances except for:

- Dialysis waiting time study
- A_2/A_2B

The Committee will recommend that these changes take place at the time a new system is implemented. OPOs that currently have a variance not recommended for inclusion:

- May apply for a 1-step transition or
- May apply for a new variance

Details for each option were sent to OPOs which submitted appeals. The Policy Oversight Committee will review the Kidney Committee's recommendations on April 6, 2012. OPOs must submit applications for transition plans by May 15, 2012. The Kidney Committee will update the Board of Directors on its plans for kidney variances at the June 2012 Board of Directors meeting. In addition to distributing the proposal for a new kidney allocation system in fall 2012, the Kidney Committee also hopes to distribute any transition plans for public comment in fall 2012 as well, with Board consideration in June 2013. Then, approved transition plans would be implemented in advance on the implementation of a new kidney allocation system.

11. Memo from the Policy Oversight Committee and Policy Oversight Committee Update

On October 26, 2011, Dr. Axelrod and Dr. Fridell updated the Committee on the activities of the Policy Oversight Committee (POC). The POC is currently providing oversight to the policy rewrite project, which is translating policy into a better structured, more reader-friendly format. The POC also evaluates committee activities and makes recommendation to the Executive Committee on whether the activities should be approved. The POC is working on multi-organ allocation, specifically liver/kidney, heart/kidney, and kidney/pancreas. There has been some discussion of listing criteria for these organ combinations with a safety net for candidates who do not meet the listing criteria but then have ongoing renal failure.

On March 14, 2012, the Committee reviewed a memo from the POC. Following several meetings held in 2011, the POC is considering policy modifications that would incorporate minimum listing criteria for

each organ in circumstances where a patient is being listed for a multi-organ transplant. In addition, the committee is considering expanding beyond the local DSA the zone where multiple organ recipients will take priority. As the POC continues working on this project, they identified four main areas for which the POC would benefit from other committees input: Minimum listing criteria, policy ambiguities, ethical principles, and logistical issues.

The POC requested that the Committee address the following questions:

1) *For those committees with minimum listing criteria: Do you think the minimum listing criteria issues are resolved for your organ and if so, what are the important principles that were used to get there?*

The Committee believes that the minimum listing criteria issues are resolved for kidney-pancreas transplants. The Committee required that the candidate meet minimum requirements for both organs in order to accrue waiting time for a kidney-pancreas transplant. The kidney portion of the criteria are the same as for isolated kidney. There are currently no minimum criteria for pancreas transplantation, so the pancreas portion of the kidney-pancreas criteria are more rigorous than for isolated pancreas.

2) *Are there organ combinations for which minimum listing criteria do not exist but should?*

The Committee thinks that multivisceral transplants should have minimum listing criteria in order to receive allocation priority. The Committee also considered whether there should be criteria for lung-pancreas and liver-pancreas. The Committee thinks that for a lung or liver candidate should have to meet the definition of cystic fibrosis-related diabetes or meet the same requirements for the pancreas portion of the SPK criteria in order to receive a pancreas with the first organ.

3) *In order to minimize unnecessary multi-organ transplants, are there adjustments needed to the allocation system that will ensure a candidate who does not receive multiple organs (due to failure to meet minimal listing criteria) could get appropriate priority if subsequent to the transplant of the primary organ he/she develops failure of the second organ?*

The Committee thought that this issue does not apply to kidney-pancreas transplants.

4) *Are there logistical issues regarding waiting list management surrounding multi-organ listing and transplant that need to be addressed?*

The Committee did not identify any specific waiting list management issues around kidney-pancreas transplants but thinks that waiting list management issues around multi-organ transplant should be addressed as part of this discussion.

5) *Are there procurement issues that could be addressed in this process?*

The Committee requested that the procurement of an isolated pancreas and an isolated intestine be considered as part of this process. There are methods that would allow both organs to be procured, but it would require coordination between procurement teams.

6) *If the concept of lifesaving organ is removed, are there key ethical principles your committee feels should be included in a framework for allocating the second organ based on a balance between equity and utility.*

The Committee did not have a comment on this question.

12. Public Comment

a. Proposal to Clarify Requirements for Waiting Time Modification Requests

Kidney Transplantation Committee

Current OPTN policies regarding submission of waiting time modification requests are not clear, leading to wasted time for the transplant centers that submit requests, for OPTN Contractor staff who process requests, and for the Committees that review requests. Required documentation is often missing and results in delays for transplant candidates to receive the waiting time that they may be entitled to receive under OPTN policy. With these proposed clarifications, the Committee believes that it will receive fewer submissions of incomplete requests and be able to act on approved requests more quickly.

The Committee considered this proposal on October 26, 2011. The Committee voted to support the proposal as written. (14-Support, 0-Oppose, 0-Abstain)

b. Proposal to Clarify and Improve Variance Policies

Policy Oversight Committee (POC)

The OPTN Contractor has initiated a plain language rewrite of the OPTN policies and bylaws. During the evaluation of the policies it was noted that significant changes to the variance policies were needed in order for members to better comply with the variance policies, create uniformity in how members apply for any type of variance, and promote reliability in the category of information provided with each variance application. As such, the following modifications are proposed:

- Elaboration of existing variance policies to provide clearer guidance to the community on how to apply for, modify, or dissolve a variance;
- Gathering all requirements into one policy category for the variance application, review, approval, modification, dissolution, and appeal processes;
- Eliminating redundancy in existing variance policies; and,
- Rewriting the variance policies using plain language.

The Committee considered this proposal on October 26, 2011. The Committee voted to support the proposal as written. (15-Support, 0-Oppose, 0-Abstain)

c. Proposed Revisions to and Reorganization of Policy 6.0 (Transplantation of Non-Resident Aliens), Which Include Changes to the Non-Resident Alien Transplant Audit Trigger Policy and Related Definitions

Ad Hoc International Relations and Ethics Committees

This proposal clarifies the data collected about the citizenship and residency of donors and recipients. The proposal also amends the audit trigger policy, allowing the Ad Hoc International Relations Committee to review the circumstances of any transplant of non-US residents/non-US citizens and make a public report. The proposal also contains technical amendments and removal of requirements that are not enforceable.

The Committee considered this proposal on October 26, 2011. The Committee was very concerned about the implications of this proposal. There was not support for an audit to be conducted by a group other than the MPSC. The Committee was uncomfortable with allowing a group to conduct an audit with no defined purpose of the audit. Additionally, the Committee did not find the new definitions useful, especially since they are not consistent with any existing residency definitions. Candidates will self-

report their residency status so the data may not be accurate. Furthermore, trying to define immigration status in the current political climate may be misinterpreted by the general public. The Committee thought that there should be no restriction on who can receive pancreata because there is not a pancreas shortage. The Committee recommended not having any residency definitions and entirely removing the audit requirements. The Committee did support the technical changes to the policy to clean up outdated language. The Committee tasked the Pancreas Outcomes Subcommittee with developing a response to this proposal regarding the audit requirements and residency definitions.

d. **Proposed Update to the Calculated PRA (CPRA)**

Histocompatibility Committee

The purpose of this proposal is to update CPRA so it can better reflect current laboratory practices as well as the current donor pool. These revisions include updating the HLA frequencies used to calculate CPRA, the addition of the antigen HLA-C to the calculation, and the addition of a question to the waiting list to better interpret 0% default CPRA value.

The Committee considered this proposal on October 26, 2011. The Committee suggested that the option for whether a candidate was tested for anti-HLA antibodies be re-worded from "yes, antibodies detected" to "yes, clinically significant antibodies detected" and from "yes, no antibodies detected" to "yes, no clinically significant antibodies detected". The Committee also requested more information on how the Histocompatibility Committee plans to handle desensitized candidates so that they can still receive priority for zero mismatch organs even if candidate does not have enough unacceptable antigens entered to yield a CPRA of greater than or equal to 80% after desensitization. The Committee voted to support the proposal. (15-Support, 0-Oppose, 0-Abstain)

e. **Plain Language Bylaws Rewrite**

Membership and Professional Standards Committee (MPSC)

The purpose of these bylaws revisions is to rewrite the bylaw language into a plain language style and to reorganize the bylaws into a more user-friendly structure. The intent and substance of the bylaws should not change with these revisions. The Committee reviewed the rewrite language to see if it thought any substantive changes had been inadvertently made in this rewrite. The Committee specifically reviewed the following sections:

- Article I: Membership (1.1 Membership Guidelines, 1.2 Transplant Hospital Members, 1.3: OPO Members, 1.4 Histocompatibility Laboratory Members)
- Article VII: Permanent Standing Committees
- Article XI: Adoption of Policies
- Appendix D: Membership Requirements for Transplant Hospitals and Transplant Programs
- Appendix G: Membership and Personnel Requirements for Pancreas and Pancreatic Islet Transplant Programs

The Committee considered this proposal on January 27, 2012. The Committee agreed that the rewritten bylaws did not change the meaning of the provisions in the bylaws. The Committee did note that the name of the ASTS committee that approved fellowship programs is the Fellowship Training Committee not the Education Committee.

The Committee also discussed areas in the bylaws that may need substantive changes. The Committee already has a project to review pancreas physician and surgeon requirements as well as pancreas program

functional inactivity requirements. The Committee plans to coordinate with other interested parties on the review of currency requirements in the bylaws. The Committee also thought it would be useful to review the islet physician and surgeon requirements and to discuss whether both positions are necessary. The Committee debated whether there should continue to be a minimum timeframe over which the primary surgeon or physician can gain experience. The Committee commented that a surgeon or physician should not have to observe three procurements. Even though the provision is a recommendation, not a requirement, the Committee was concerned about recommending the observation of three procurements when it may require the surgeon or physician to travel simply to observe. Given the dangers involved in traveling to procure organs, the Committee recommended that the MPSC reconsider this observation provision across all organs. The Committee also emphasized the need to work on a definition of pancreas graft failure.

f. **OPTN Bylaws Substantive Rewrite of Appendix A: Application and Hearing Procedures for Members and Designated Transplant Programs**

Membership and Professional Standards Committee

This rewrite affects the current Appendix *A: Application and Hearing Procedures for Members and Designated Transplant Programs.* This represents a substantive rewrite of the process and procedures for reviewing potential violations of and non-compliance with OPTN obligations. All content of the former Appendix A also underwent a plain language rewrite and reorganization for clarity and usability, and will be presented as the new *Appendix L: Reviews, Actions, and Due Process.*

The Committee considered this proposal on March 14, 2012. The Committee voted to support the proposal with no additional comments. (16-Support, 0-Oppose, 0-Abstain)

13. Review of US Public Health Service Guidelines

On October 20, 2011, the Committee discussed the US Public Health Service guidelines for reducing transmission of HIV, HBV, and HCV through solid organ transplantation. These guidelines are updated from the 1994 guidelines regarding the risk of transmission of HIV. The Committee thought the newly defined risk factors were not adequately data driven and were overly broad. The factors under sexual contact will increase the number of donors classified as increased risk, which could result in organ wastage. Candidates may turn down organs based solely on this designation. Also, the timeframes for increased risk behavior are too wide if NAT testing results are available. If NAT results are available, only increased risk behavior in the previous two weeks is most relevant. Thus, for donors in lower risk categories (e.g. number of sexual contacts, monogamous male homosexual relationship), behavior beyond two weeks should not considered to be high risk. The Committee supports NAT testing for increased risk donors. However, testing for low risk donors will result in false positives that could lead to organ wastage as well as the very small risk of false negatives in very high risk donors (e.g. intravenous drug use which warrants continued use of the high risk label even with a negative NAT test. Requiring testing for all donors may increase the cost of transplantation with little benefit among lower risk donors, and with the real risk that organs will be discarded unnecessarily leading to waiting list death. Furthermore, NAT testing is not widely available. In the case of unstable donors, waiting for NAT testing could result in not being able to use any of the donor's organs. These requirements should be considered in the context of solid organ transplantation where there is a shortage of organs and the impact of discards from false positives is greater than in blood donation. The Committee inquired why the requirements for NAT testing for HBV are inconsistent with the requirements for NAT testing for HIV and HCV.

The Committee thought the requirements for storing samples for future testing on deceased donors should be clarified to indicate that it is the Host OPO**, not the transplant center**, that must store the specimen.

For storing living donor samples for future testing, the Committee thought 10 years was too long. There are also HIPAA concerns with storing samples from living donors. Doing so requires consent from the donor. Retaining the records of the testing should be sufficient. There will be cost and labor involved in complying with these requirements. If the requirement is costly, there needs to be evidence that the requirement provides sufficient benefit to justify these decisions. Neither has been demonstrated for these storage requirements.

The Committee inquired whether the infusion of crystalloid and colloid solutions and blood transfusions result in higher false negative results for NAT testing. There should be a prospective study to determine if this is the case.

The Committee was concerned about the requirement that all stored blood vessels from a donor found to be HIV, HBV, or HCV infected should be retrieved and quarantined immediately and either used only for research purposes or destroyed. The Committee believes automatic disposal of vessels will hurt more people than it saves. There is no reason not to use a vessel from a donor found to be infected with HBV, or HCV in a recipient who received an organ from the same donor. Just because a vessel is positive for HBV or HCV does not mean it should be discarded. The use of these vessels should follow the same standards as for HBV or HCV infected organs. It should not be forbidden but rather allowed with appropriate precautions including storage, labeling, pre-implantation time out, and documentation of use or destruction.

14. Committee Orientation

On October 26, 2011, Dr. Axelrod welcomed the new Committee members, and James Bowman, III, MD, HRSA representative on the Committee, welcomed the Committee on behalf of the Health Resources and Services Administration. The Committee requested that HRSA provide ongoing guidance on how to deal with the conflicting incentives created by the organs transplanted per donor metric for OPOs from the Centers for Medicare and Medicaid Services (CMS) and the graft outcomes metrics for transplant hospitals. Additionally, the Committee was interested in working with HRSA to pursue discussions with the CMS on islet standard acquisition charges.

Elizabeth F. Sleeman, MHA, liaison to the Pancreas Transplantation Committee, presented information regarding the charge and goals of the committee.

Pancreas Transplantation Committee Charge

The Pancreas Transplantation Committee is charged with considering medical, scientific, and ethical aspects related to pancreas and pancreas islet organ procurement, distribution, and allocation. The Committee will consider both the broad implications and the specific member situations relating to pancreas and pancreas islet issues and policies.

The goal of the Committee's work is to develop evidence-based policies aimed at

- reducing the burden of disease candidates and recipients of pancreas and islet transplants,
- increasing pancreas and islet utilization,
- improving access to pancreas and islet transplantation as appropriate, and
- improving the health outcomes of pancreas and islet transplant recipients.

2010-2011 Pancreas Transplantation Committee Work Plan:

1. Implement the Pancreas Allocation System (approved by the Board in November 2010) that will increase utilization of the pancreas, increase access for SPK and PA candidates, reduce waiting

time for all pancreas candidates without adversely affecting adult and pediatric renal transplantation candidates, and reduce geographic inequities of access and waiting time.

2. Pancreas for technical reasons: It is not clear how pancreata used for technical reasons should be reported. 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, so the disposition can be reported differently. This discrepancy in reporting results in data errors.
3. Review Pancreas Primary Physician/ Surgeon Bylaws: The bylaw requirements for primary pancreas physicians and surgeons stands to be reviewed for currency and improvements.
4. Report Islet Infusions: There is currently no OPTN tracking of islets once they have been infused. There is a mechanism for report islet infusions in UNet℠, it is just not required in policy.

UNOS and SRTR staff presented the Committee with orientation information covering the following topics:

- Committee System and Member Roles and Responsibilities by Elizabeth Sleeman
- Overview of Policy Development Process and Process for Developing Committee Strategic Priorities by Elizabeth Sleeman
- Introduction to the UNOS Research Department by Jennifer L. Wainright, PhD
- Overview of the Scientific Registry of Transplant Recipients (SRTR) by Sally Gustafson, MS, and Raja Kandaswamy, MD
- Current Activities and Subcommittees by David Axelrod, MD, MBA

The Committee inquired whether c-peptide will be collected in the new pancreas allocation system. C-peptide will be collected in the Waitlist℠ application in order for a kidney/pancreas candidate to accrue waiting time, but the field was not approved for data collection on registration and follow-up forms. The Committee noted the need for further discussion on how to define and report pancreas graft failure.

The Committee discussed what they would like evaluate when the new pancreas allocation system is implemented, including:

- Change in waiting list mortality;
- Pancreas utilization rates;
- Impact, if any, on patient and graft survival;
- The appropriate c-peptide and BMI values for a candidate to qualify to accrue waiting time for a kidney/pancreas registration; and
- Cardiovascular outcomes.

The Pancreas Allocation Subcommittee will begin developing a thorough evaluation plan.

15. Overview of Pancreas Committee Projects

On March 14, 2012, the Committee reviewed the projects it requested to continue working on in the 2012-2013 Committee year:

- Implement pancreas allocation system approved by the Board in November 2010
- Islet infusion reporting
- Pancreas for technical reasons
- Review pancreas primary physician/surgeon bylaws
- Investigating characteristics resulting in improved PAK outcomes

The Committee has also requested to begin work on the following new projects in the 2012- 2013 Committee year:

- Defining pancreas graft failure

- Review of facilitated pancreas allocation
- Investigating sources of pancreas discards
- Investigating DCD pancreas outcomes
- Best practices for isolated pancreas recovery with an isolated intestine recovery

The POC will review these projects and forward a recommendation to the Executive Committee, which will decide on the Committee's projects for the upcoming Committee year.

16. Isolated Pancreas Recovery with Isolated Intestine Recovery

On March 14, 2012, the Committee discussed whether there were any methods for recovering an isolated pancreas and an isolated intestine from the same donor. A Committee member shared his work on this topic. If the project is approved by the Executive Committee, the Committee would like to work with other Committees to establish best practices in this area with the goal of reducing pancreas discards when an isolated intestine is recovered.

17. Recognition of Outgoing Members

On March 14, 2012, Dr. Axelrod recognized the following Committee members with terms ending on June 30, 2012:

- Ty Dunn, MD- Region 7 Representative
- Charles Bratton, MD- Region 11 Representative
- Nicole Beauvais, PA-C- At Large Representative
- Anissa Cole- At Large Representative
- Barry Friedman, RN, BSN, MBA, CPTC- At Large Representative
- Danielle Neidfeldt, JD, RN- At Large Representative

Table 23: Pancreas Transplantation Committee Attendance

PANCREAS COMMITTEE		JULY 1, 2011 - DECEMBER 31, 2011	
	MONTH	OCTOBER	OCTOBER
	DAY	20	26
	FORMAT	Live Meeting/ Teleconference	In Person
NAME	COMMITTEE POSITION		
David Axelrod, MD, MBA	Chair	X	X
Jonathan Fridell, MD	Vice Chair	X	X
Sayeed Malek, MD	Regional Rep.		
James Lim, MD	Regional Rep.		
Joseph Magliocca, MD	Regional Rep.	X	X
John Duffy, MD	Regional Rep.		X
Jonathan Fisher, MD, FACS	Regional Rep.	X	X
Nelson Goes, MD	Regional Rep.	X	X
Ty Dunn, MD	Regional Rep.		X
Michael Morris, MD	Regional Rep.	X	X
Bernd Schroppel, MD	Regional Rep.		X
Edmund Sanchez, MD	Regional Rep.	X	X
Charles Bratton, MD	Regional Rep.	X	X
Nicole Beauvais, PA-C, MMS	At Large		X
Lisa Chronis, RN	At Large		
Anissa Cole	At Large		X
Barry Friedman, RN, BSN, MBA, CPTC	At Large		By phone
Monica Grafals, MD	At Large		X
Albert Hwa, PhD	At Large		
Danielle Niedfeldt, JD, RN	At Large		X
Jason Wellen, MD	At Large		X
Dixon Kaufman, MD, PhD	Ex. Officio		
James Bowman III, MD	Ex. Officio	X	X
Monica Lin, PhD	Ex. Officio		
Ba Lin, MS, MPH	Ex Officio	X	By phone
Raja Kandaswamy, MD	SRTR Liaison		X
Sally Gustafson, MS	SRTR Liaison		X
Bertram Kasiske, MD, FACP	SRTR Liaison		By phone
Elizabeth Sleeman, MHA	Committee Liaison	X	X
Jennifer Wainright, PhD	Support Staff	X	X
Rich Endert	Support Staff		X

Table 24: Pancreas Committee Attendance

PANCREAS COMMITTEE		JANUARY 1, 2012 - JUNE 30, 2012	
	MONTH	JANUARY	MARCH
	DAY	27	14
	FORMAT	Live Meeting/ Teleconference	In Person
NAME	COMMITTEE POSITION		
David Axelrod, MD, MBA	Chair	X	X
Jonathan Fridell, MD	Vice Chair	X	X
Sayeed Malek, MD	Regional Rep.		X
James Lim, MD	Regional Rep.		
Joseph Magliocca, MD	Regional Rep.		
John Duffy, MD	Regional Rep.	X	X
Jonathan Fisher, MD, FACS	Regional Rep.		X
Nelson Goes, MD	Regional Rep.	X	X
Ty Dunn, MD	Regional Rep.		
Michael Morris, MD	Regional Rep.	X	X
Bernd Schroppel, MD	Regional Rep.	X	X
Edmund Sanchez, MD	Regional Rep.	X	X
Charles Bratton, MD	Regional Rep.		X
Nicole Beauvais, PA-C, MMS	At Large	X	X
Lisa Chronis, RN	At Large		
Anissa Cole	At Large	X	X
Barry Friedman, RN, BSN, MBA, CPTC	At Large		
Monica Grafals, MD	At Large		X
Albert Hwa, PhD	At Large	X	X
Danielle Niedfeldt, JD, RN	At Large	X	X
Jason Wellen, MD	At Large		X
Dixon Kaufman, MD, PhD	Ex. Officio		
James Bowman III, MD	Ex. Officio		X
Monica Lin, PhD	Ex. Officio		By phone
Ba Lin, MS, MPH	Ex Officio	X	By phone
Raja Kandaswamy, MD	SRTR Liaison	X	
Sally Gustafson, MS	SRTR Liaison		X
Kim Nieman	SRTR Liaison	X	
Peter Stock, MD, PhD	SRTR Liaison		X
Jon Snyder, PhD, MS	SRTR Liaison		By phone
Elizabeth Sleeman, MHA	Committee Liaison	X	X
Jennifer Wainright, PhD	Support Staff	X	X
Manny Carwile	Support Staff	X	X
Kerrie Cobb	Support Staff	X	
Sally Aungier	Support Staff	X	
Leigh Kades	Support Staff	X	