

OPTN/UNOS Liver and Intestinal Organ Transplantation Committee Summary

I. Organ Availability Issues:

Action Items for Board Consideration:

- None

Other Significant Items:

- None

II. Patient Access Issues:

Action Items for Board Consideration:

- In response to a prior Board resolution, the Committee asks the Board to consider a resolution stating that the MELD/PELD allocation system adequately addresses the issue of biologic disadvantage for candidates awaiting liver transplantation. (Item 3, page 1)

Other Significant Items:

- None

III. Other Issues:

Action Items for Board Consideration:

- The Board is asked to grant final approval, post-public comment, to modifications to Policy 3.6 (Adult Donor Liver Allocation) that will allocate livers to patients with MELD/PELD scores of 15 or higher at the local and regional level prior to those with MELD/PELD scores of less than 15. (Item 4, Page 2)
- The Board is asked to grant final approval, post-public comment, to modifications to Policies 3.6 (Adult Patient Status), 3.6.4.4 (Liver Transplant Candidates with Hepatocellular Carcinoma (HCC)) and 3.6.4.5 (Liver Candidates with Exceptional Cases) that would institute a minimum listing criteria of a MELD score of 10 for adult liver candidates. Candidates whose MELD score is less than 10 may be listed at their calculated MELD score upon prospective approval of the RRB. (Item 4, Page 2)
- The Board will consider a recommendation to require that serum sodium must be collected each time the MELD/PELD score is updated in UNetSM. (Item 4, Page 2)
- The Board is asked to grant final approval, post-public comment, to modifications to Policies 3.6 (Pediatric Donor Liver Allocation Algorithm & Allocation Sequence for Patients with PELD or MELD Scores Less than or Equal to 6 (All Donor Livers)), 3.6.4.2 (Pediatric Patients Status), 3.6.4.2.1 (Pediatric Patient Reassessment and Recertification Schedule), 3.6.4.3 (Pediatric Liver Transplant Candidates with Metabolic Diseases), and 3.6.4.4.1 (Pediatric Liver Transplant Candidates with Hepatoblastoma) that would assign the MELD score to candidates aged 12-17. (Item 5, Page 8)

- The Board is asked to grant final approval, post-public comment, to a modification to Policy 3.6.2.1 (Allocation of Blood Type O Donors) stating that, with the exception of Status 1 patients, blood type O donors may only be allocated to blood type O patients, or B patients with a MELD or PELD score greater than or equal to 30. (Item 6, Page 16)
- The Board is asked to grant final approval, post-public comment, to a modification to Policy 3.6.2.1 (Allocation of Blood Type O Donors) that would allow any remaining blood type compatible candidates to appear on the match run list for blood type O donors after the blood type O and B candidate list has been exhausted at the regional and national level. (Item 6, Page 16)
- The Board will consider a recommendation that Policy 3.6.2 (Blood Type Similarity Stratification/Points) be amended to modify the phrase “A₂-blood type” to “non-A₁ blood type” for consistency with donor subtyping reporting practices. (Item 7, Page 17)
- The Board is asked to grant final approval, post-public comment, to modifications to Policy 3.6.4.4.1 (Adult Patient Reassessment and Recertification Schedule) and 3.6.4.2.1 (Pediatric Patient Reassessment and Recertification Schedule) that would reassign patients whose laboratory values are uncertified to a MELD/PELD score of 6. (Item 8, Page 18)
- The Board is asked to grant final approval, post-public comment, to modifications to the Region 5 sharing agreement for Status 1 candidates. (Item 9, Page 19)
- The Board will consider a recommendation to modify the Region 7 sharing agreement. (Item 10, Page 22)
- The Board will be asked to approve the Missouri State Alternative Local Unit for the allocation of livers. (Item 11, Page 22)
- The Board is asked to approve a recommendation that UNetSM should no longer automatically relist patients removed from the liver waiting list for living donor transplantation. (Item 12, Page 23)
- The Board will consider a modification to Policy 3.6.4.5 (Liver Candidates with Exceptional Cases) that would permit MELD/PELD score increases at 3 months for exceptions. (Item 13, Page 23)
- The Board is asked to consider the draft goals for liver and intestinal organ allocation policy development , submitted in response to a request made by the Board in November 2003. (Item 14, Page 24)

Other Significant Items:

- The Committee accepted the Living Liver Donor Evaluation Guidelines, with the provision that the living donor candidate should meet the minimal listing criteria for deceased donor recipients (MELD score of 10 or higher) and qualify as a candidate for deceased donor transplantation at the transplant center. (Item 15, Page 25)
- The Committee continues to investigate of the feasibility of a national review board and national standards for exceptions to the MELD/PELD system. (Item 17, Page 25)
- The Committee reviewed MELD/PELD exceptional cases that were not approved by the RRB within 21 days but were transplanted at the requested score, and Status 1 cases not resolved at the Regional level. (Item 27, Page 28).

**REPORT OF THE
OPTN/UNOS LIVER AND INTESTINAL ORGAN TRANSPLANTATION
COMMITTEE
TO THE BOARD OF DIRECTORS**

**Minneapolis, MN
June 24-25, 2004**

**C. Wright Pinson, M.D., M.B.A, Chair
John R. Lake, M.D., Vice Chair**

The following report presents the OPTN/UNOS Liver and Intestinal Organ Transplantation Committee's deliberations and recommendations on matters considered by the Committee during its February 5, 2004 and May 20, 2004 meetings.

I. Organ Availability Issues

1. Memoranda from the Organ Availability Committee (OAC) re: Pancreas Procurement in the Presence of Hepatic Anomalies. During the February 2004 meeting, the Liver Committee reviewed a motion of the OAC stating that “in the event of hepatic vascular variations such as replaced right-hepatic artery, the procurement of the liver and pancreas will occur if recipients are identified for each.” The Liver Committee unanimously approved the following motion:

Motion: The Liver Committee supports the procurement of both the pancreata and the liver whenever possible.

2. Modifications to Policy 4 (Acquired Immune Deficiency Syndrome (AIDS) and Human Pituitary Derived Growth Hormone (HPDGH) and Human T-Lymphotropic Virus Type (HTLV-I)). Jorge Reyes, MD, reported the discussions of the OPO Joint Subcommittee regarding reporting information on HIV and HTLV positive donors. The Committee discussed potential modifications to Policy 4.0-4.8. Due to the high rate of false positives for HTLV, it was felt that these organs should not be excluded from donation. The issue was not as clear-cut for HIV donors. The Liver Committee approved a motion stating that policies should allow for the possibility of an offer occurring for HIV+ donors to HIV+ recipients. It was noted that Federal Law may prohibit the use of HIV+ donors. The Committee discussed the use of HGPD+ donors, which could increase the likelihood of contracting CJ disease. The Subcommittee felt that the use of these donors should be at the discretion of the potential recipient and transplant surgeon; the Liver Committee agreed with this recommendation. Regarding the reporting of potential diseases that the donor may have contracted, as well as malignancies, the Subcommittee felt that a list of diseases that had been compiled for their review was appropriate (provided in the OPO Committee’s report to the Board of Directors). The Liver Committee took no action on this item.

II. Patient Access Issues

3. Request from the Patients Affairs Committee Regarding Biologically Disadvantaged Patients. During the November 2003 meeting, the Board of Directors charged all Committees to “investigate further ways to assist biologically disadvantaged patients.” The Liver Committee has discussed this issue several times previously, and has taken the position that use of the MELD/PELD score for liver allocation addresses the needs of biologically disadvantaged candidates. The Committee unanimously approved the following resolution for consideration by the Board of Directors:

***** RESOLVED, that the MELD/PELD allocation system adequately addresses the issue of biologic disadvantage for candidates awaiting liver transplantation.**

III. Other Issues: Action Items for Board Consideration

4. Report From “Evolving Concepts In Liver Allocation In The MELD/PELD Era. Richard Freeman, MD, presented the findings from a consensus conference held in December 2003 (**Exhibit A**). The conference attendees, who met to assess how the MELD/PELD allocation system is performing, recommended several action items for the Liver Committee to consider. There was strong consensus that the MELD/PELD system is working well and is better than the prior allocation system. Dr. Freeman reviewed data presented during the conference, which can be summarized as follows:

1. The rate of death on the waiting list, adjusted for the size of the waiting list, declined over the 18-month period but is not statistically significant. The transplant rate increased for adults.
2. The MELD score at transplant is decreasing over time, in part due to the reduction in the score assigned to candidates with hepatocellular carcinoma (HCC); this was statistically significant.
3. At one year, 23% of transplants were in HCC patients and 6% for other exceptional cases; by 18 months this had decreased to 14% for HCC and 5% for non-HCC exceptions.
4. After the score assigned to exceptional candidates with HCC was reduced, the probability of an HCC patient still waiting at 3 months increased from 40% to 50%, while the percentage who were transplanted reduced from 60% to 45%, and removals for death/too sick or other reason were unchanged.
5. Overall 6-month survival rates are excellent at 90% for adult MELD patients and 80% for Status 1 patients. HCC recipients have slightly higher survival rates than non-HCC patients.
6. The ability of the MELD score to predict mortality is very high. Recent research indicates that hyponatremia appears to be a good marker for ascites and could improve the MELD score’s predictive ability.
7. A high number of first offers occur in patients with low MELD scores. For adults, 21% of liver transplants were for patients with MELD scores of 14 or less. In some OPOs, more than 10% of their transplants are in candidates with MELD scores less than 10, where in other OPOs this percentage is zero.
8. The hazard ratio (HR) for death is greater than 1 for patients with MELD scores of less than 10 and for patients with MELD scores in the 10-14 range (statistically significant), meaning that there is no demonstrable benefit to transplanting patients with low scores.

The consensus report included several action items for the Committee to consider:

1. Recommend regional sharing to MELD scores ≥ 15 prior to local allocation to patients with MELD score less than 15.
2. Recommend that a minimum MELD score of 10 should be required for placement on the OPTN waiting list.
3. Continue to provide current exception scores for T2 lesions, but decrease T1 exception points. Allow exception points for larger single T3 lesions that are treated prior to transplant.
4. Collect prospective data on serum sodium and significant objective measures of ascites for future analysis.

- ***Consensus Report Action Item #1***

The conference attendees recommended a modification to the allocation system that would offer organs first to patients with a MELD/PELD score of 15 or higher (locally and regionally) prior to patients with lower scores. This was based on data presented by the Scientific Registry of Transplant Recipients (SRTR) staff, which had been presented to the Liver Committee previously, showing that adult candidates with MELD scores below 15 had a higher relative risk of mortality if given a transplant compared with candidates with similar MELD scores who stayed on the list while at that MELD score. This suggests that, at least in the 1-year post-transplant follow-up period, candidates with MELD scores below 15 received no survival benefit. The consensus conference working group assigned to this issue felt that organs should be directed towards those who would most likely benefit from transplantation. Under the existing system, 21% of all adult liver transplants were in recipients whose MELD scores were less than 15. It was suggested that the distribution system could be modified such that candidates with MELD scores of 15 or higher would be offered organs before candidates with MELD scores below 15. The conference report concluded that this action “in effect establishes a ‘minimum transplant score’ but does not absolutely prevent lower score patients from getting organs.” The Liver Committee considered the proposed allocation algorithm, which would allocate adult livers as follows:

- Local Status 1 Candidates
- Regional Status 1 Candidates
- Local Candidates with MELD/PELD scores ≥ 15
- Regional Candidates with MELD/PELD scores ≥ 15
- Local Candidates with MELD/PELD scores < 15
- Regional Candidates with MELD/PELD scores < 15
- National Status 1 Candidates
- National Candidates by descending MELD/PELD score

It was recognized that there may be a subset of patients with MELD scores in the 10-14 range that may benefit from transplantation; this proposed allocation policy would not preclude these patients from receiving a transplant. Committee members felt that this approach would achieve the goal of reducing the number of organs transplanted in patients who have not been shown to benefit from transplantation. This proposal and the proposal for minimum listing criteria (action item #2) are not necessarily mutually exclusive; the minimum listing criteria proposal was based on whether individuals would derive benefit from transplantation, whereas this proposal seeks to allocate livers among those most likely to benefit.

Having considered these data at two prior meetings, and with the understanding that the benefit of transplantation appears to be realized at or above a MELD score of 15, the Committee agreed that the proposal should be circulated for public comment, and also requested that the proposed scenario be modeled by the SRTR. For those children that can accept an adult donor, the preference would be granted to patients with PELD scores of 15 or higher as well. The Committee noted that a proposal to assign MELD scores to pediatric adolescent patients was also being considered at this time. The Committee clarified that the algorithm should use the match score, and that patients with RRB-approved exceptions for HCC or other diagnoses would be included in the higher priority group for Regional sharing if their approved MELD/PELD score is 15 or greater.

By a vote of 20 in favor, 1 opposed, and 1 abstention, the Committee approved that the proposal should be circulated for public comment and modeled using LSAM. A complete description of the policy proposal and the supporting analyses are contained in **Exhibit B**.

Response to Public Comment

As of April 29, 2004, 108 responses had been submitted to UNOS regarding this policy proposal. Of these, 30 (27.78%) supported the proposal, 34 (31.48%) opposed the proposal, and 44 (40.74%) had no opinion. Of the 64 who responded with an opinion, 30 (46.88%) supported the proposal and 34 (53.13%) opposed the proposal. Many of the comments submitted in opposition were duplicates of two individual comments. Nine Regions voted in favor of the policy, with two opposed. This proposal was also supported by the AASLD. The Committee responded to comments submitted in opposition to the policy. A programming specification document was also provided for the Committee's review.

A summary of the Committee's responses to the public and region comment is as follows:

- The use of the MELD score for liver allocation is well justified, as data have shown that it is reducing waiting list mortality.
- Regarding assertions that broader sharing will negatively impact local procurement efforts, the Committee noted that there has been no evidence provided that broader sharing reduces willingness to donate.
- The proposed algorithm still maintains some aspect of local primacy, in that the organs would first be offered to local patients with MELD/PELD scores of 15 or greater.

The Committee reviewed the results of the LSAM modeling. Six different scenarios were modeled in addition to the current policy rules (**Exhibit B**):

- Min10: Simulates the current policy, but candidates with MELD scores of less than 10 are not offered organs.
- Share15: Livers are offered locally and regionally to candidates with MELD/PELD scores of 15 or higher before local candidates with MELD/PELD scores lower than 15

- Combined: Combines Min10 and Share 15.
- Adult15: This system follows the Share15 rules for adults, but allocation for pediatric candidates is the same as the current policy.
- Combined Adult: Combines Adult15 and Min10.
- Combined and Adolescent MELD and Pediatric Share (CAMPS): This utilizes the Combined system, incorporating the use of the MELD score for adolescents and regional sharing for pediatric donor livers to children aged 0-11.

The difference in the number of transplants to small children, adolescents, and adults varied by policy. The Share15 and Combined yielded a reduction in transplants to pediatric patients, while the Adult15 increase the number of pediatric transplants by 45 and decreased the number of adult transplant by 49. The Combined Adult and CAMPS models increased pediatric transplants without having as great a decrease in the number of adult transplants. The distribution of transplants by age group and for Status 1s and MELD/PELD categories was shown for each proposal. The overall number of deaths as compared to the current policy was decreased by 43 for the Adult 15, but is reduced by a total of 71 by adding in the Min10. In terms of life years gained compared to the current policy, Combined and Combined Adult showed an increase of 26 years. The Committee decided not to vote on any individual model, as none exactly matched the proposals that were circulated for public comment. However, Combined Adult was very similar to this proposal combined with the proposal for sharing for MELD/PELD scores greater than 15.

Having responded to the public comments and reviewed the LSAM modeling results, the Committee continued to support the proposal. The Committee submits the following resolution for consideration by the Board of Directors:

***** RESOLVED, that subsequent to consideration of the public comment, Policy 3.6 (Adult Donor Liver Allocation) shall be amended as follows and implemented upon completion of programming in the UNOS System:**

Adult Donor Liver Allocation Algorithm

Local

1. Status 1 patients in descending point order

Regional

2. Status 1 patients in descending point order

Local

- ~~3. All other patients in descending order of mortality risk scores (probability of candidate death)~~

Regional

- ~~4. All other patients in descending order of mortality risk scores (probability of candidate death)~~

Local

3. Patients with MELD/PELD Scores ≥ 15 in descending order of mortality risk scores (probability of candidate death)

Regional

4. Patients with MELD/PELD Scores ≥ 15 in descending order of mortality risk scores (probability of candidate death)

Local

5. Patients with MELD/PELD Scores < 15 in descending order of mortality risk scores (probability of candidate death)

Regional

6. Patients with MELD/PELD Scores < 15 in descending order of mortality risk scores (probability of candidate death)

National

7. Status 1 patients in descending point order

~~5. All other patients in descending order of mortality risk scores (probability of candidate death)~~

~~8. All other patients in descending order of mortality risk scores (probability of candidate death)~~

Committee Vote: 21 in favor, 1 opposed, 0 abstentions.

• Consensus Report Action Item #2

The consensus report recommended that “a minimal MELD of 10 should be required for placement on the UNOS waiting list.” This was based upon data presented by the SRTR regarding the benefit of transplantation, using the cohort of patients listed between September 2001 and April 2003, and was consistent with earlier findings presented to the Committee. In summary, patients with a MELD score of less than 10 had a hazard ratio (HR) of 2.19 ($p=0.01$), while patients with MELD scores in the 10-14 range had an HR of 1.77 ($p<0.01$). Thus, patients in these lower MELD score categories were seen to have no benefit, and may experience potential harm, from transplantation. The benefit of transplantation was demonstrated beginning with the 15-19 MELD score range (HR=0.62, $p<0.01$) with increasing benefit throughout the higher ranges of MELD scores. The consensus report also recommended that candidates with scores less than 10 could be entered on the waiting list after approval of the RRB. The Liver Committee considered this recommendation, which was consistent with a proposal put forward by the Committee in July 2003 that was subsequently withdrawn.

Committee members discussed the potential effectiveness of the proposal in light of their recommendation of Regional sharing for MELD/PELD scores of 15 and higher. It was reiterated that the purpose of allocation using the MELD score was to direct livers towards those patients most in need of a transplant. The proposal to allocate livers to patients with MELD scores of 15 or higher above patients with MELD scores of less than 15 should reduce the number of livers transplanted in patients with low MELD scores without restricting access to the waiting list. It was not clear what the combined impact of the two proposals might be, if both are approved and implemented. The Committee asked that the minimum listing proposal be modeled by the SRTR using their LSAM model.

Several Committee members expressed concern that the proposal may restrict transplant hepatology care for patients with low MELD scores, as it was hypothesized that patients may have better survival under the care of a transplant hepatologist. Committee members suggested that, in conjunction with the proposal, a statement be made by UNOS that some patients with MELD scores less than 10 should still be under the care of a transplant hepatologist. There was also concern that potentially useful data, such as the progression of MELD scores, would be lost if patients with low MELD score were not allowed to be listed. Some members also expressed concerns about restricting access to the waiting list.

The Committee agreed that the policy should allow patients with approved exceptions to be listed even if their calculated MELD score is less than 10. Patients with Stage T1 HCC could be listed at their calculated MELD score if approved by the RRB. The Committee discussed how patients whose MELD scores drop below 10 should be managed; it was decided that patients would be allowed to remain on the list once they meet the criteria at listing. Similarly, patients with MELD scores less than 10 who are on the list at the time of implementation would remain on the list.

After discussion, the Committee voted to approve the policy modification to be circulated for public comment, by a vote of 12 in favor, 9 opposed, and 2 abstentions. A complete description of the policy proposal and the supporting analyses is included in **Exhibit C**.

Response to Public Comment

As of the end of the comment period, 106 responses had been submitted to UNOS regarding this policy proposal. Of these, 36 (33.96%) supported the proposal, 23 (21.70%) opposed the proposal, and 47 (44.34%) had no opinion. Of the 59 who responded with an opinion, 36 (61.02%) supported the proposal and 23 (38.98%) opposed the proposal. Six Regions voted to approve the proposal, with 5 opposed. Most of the opposition related to the concern for pre-transplant hepatology care. This proposal was supported by the American Association for the Study of Liver Diseases (AASLD). The Committee responded to comments submitted in opposition to the policy (**Exhibit C**). A programming specification document was also provided for the Committee's review.

The Committee discussed the potential effects of this proposal. Some Committee members remained concerned that patients would not be referred early enough with if the minimum listing criteria is put into effect, and that this might be seen as a restriction of access to care. There was no evidence available that the current minimum criteria of a CTP of 7 was deterring physicians from referring patients for transplants. It was reiterated that patients with lower MELD scores who are in need of a transplant may be listed through the Regional Review Board. One member commented that the professional societies (AST, AASLD) should be setting the standards for referral and listing rather than UNOS. With this proposal, the OPTN would also lose the ability to track disease progression for these patients. However, there are likely many thousands of patients with chronic liver disease are currently not being referred for transplantation and are therefore not being tracked. The value of listing patients with low MELD score for tracking purposes was discussed; SRTR data indicate for most patients who are listed with a MELD of less than 10, the increase in 6 months is only 2 MELD points. Finally, it was noted that the net-benefit analyses were based on groups of patients, and it was recognized that results will vary based on individual patients and donors. There is no model yet that can tell the Committee what will happen to an individual patient and/or organ. The SRTR analysis does not show net benefit for those patients with MELD scores less than 10. Furthermore, any measurable benefit for these candidates will be lower than for patients with higher MELD scores. After lengthy discussion, the question was called, and the Committee voted on the proposal. The Committee submits the following resolution for consideration by the Board of Directors:

*** **RESOLVED, that subsequent to consideration of the public comment, Policies 3.6 (Adult Patient Status), 3.6.4.4 (Liver Transplant Candidates with Hepatocellular Carcinoma (HCC)) and 3.6.4.5 (Liver Candidates with Exceptional Cases) shall be amended as follows and implemented upon completion of programming in the UNOS System:**

3.6.4.1 **Adult Patient Status.** Medical urgency is assigned to an adult liver transplant patient (greater than or equal to 18 years of age) based on either the criteria defined below for Status 1, or the patient's mortality risk score as determined by the prognostic factors specified in Table 1 and calculated in accordance with the MELD Scoring System. A patient who does not meet the criteria for Status 1, or have a MELD score that, in the judgment of the patient's transplant physician, appropriately reflects the patient's medical urgency, may nevertheless be assigned to Status 1 or a higher MELD score upon application by his/her transplant physician(s) and justification to the applicable Regional Review Board that the patient is considered, by consensus medical judgment, using accepted medical criteria, to have an urgency and potential for benefit comparable to that of other patients listed as Status 1 or having the higher MELD score. The justification must include a rationale for incorporating the exceptional case as part of the Status 1 criteria or the MELD calculation. A report of the decision of the Regional Review Board and the basis for it shall be forwarded to UNOS for review by the Liver and Intestinal Organ Transplantation and Membership and Professional Standards Committees to determine consistency in application among and within Regions and continued appropriateness of the Status 1 and MELD criteria. ~~During the initial implementation of the MELD/PELD scoring system, the minimum listing criteria in effect prior to implementation of the MELD/PELD system (a CTP score of 7) shall remain in effect.~~ Adult patients must have a MELD score of 10 or higher in order to be added to the waiting list; once listed with a MELD score of 10, the patient may remain listed

even if the MELD score drops below 10. Patients who are on the list with a MELD score of less than 10 at the time of policy implementation may remain on the waiting list.

<< No further changes to 3.6.4.1 >>

3.6.4.4 Liver Transplant Candidates with Hepatocellular Carcinoma (HCC). Patients with Stage II HCC in accordance with the modified Tumor-Node-Metastasis (TNM) Staging Classification set forth in Table 3 that meet all of the medical criteria specified in (i) and (ii) may receive extra priority on the waiting list as specified below. A patient with an HCC tumor that is greater than or equal to 2 cm and less than 5cm or no more than 3 lesions, the largest being less than 3 cm in size (Stage T2 tumors as described in Table 3) may be registered at a MELD/PELD score equivalent to a 15% probability of candidate death within 3 months. Patients with Stage T1 HCC may be listed at the calculated MELD score upon prospective approval by the RRB.

<< No further changes to 3.6.4.4 >>

3.6.4.5 Liver Candidates with Exceptional Cases. Special cases require prospective review by the Regional Review Board. The center will request a specific MELD/PELD score and shall submit a supporting narrative. The Regional Review Board will accept or reject the center's requested MELD/PELD score based on guidelines developed by each RRB. Each RRB must set an acceptable time for Reviews to be completed, within twenty-one days after application; if approval is not given within twenty-one days, the patient's transplant physician may list the patient at the higher MELD or PELD score, subject to automatic referral to the Liver and Intestinal Organ Transplantation and Membership and Professional Standards Committees. Exceptions to MELD/PELD score must be reapplied every three months; otherwise the patient's score will revert back to the patient's current calculated MELD/PELD score. If the RRB does not recertify the MELD/PELD score exception, then the patient will be assigned a MELD/PELD score based on current laboratory values. A patient's approved score will be maintained if the center enters the extension application more than 3 days prior to the due date and the RRB does not act prior to that date (i.e., the patient will not be downgraded if the RRB does not act in a timely manner). If the extension application is subsequently denied then the patient will be assigned the laboratory MELD score. Patients whose MELD score is less than 10 may be listed at their calculated MELD score upon prospective approval of the RRB.

Committee Vote: 16 in favor, 6 opposed, 1 abstention.

- **Consensus Report Action Item #3**

The consensus report discussed the issue of transplantation for HCC patients, and recommended maintenance of the current priority for Stage T2 HCC lesions, but suggested some reduced priority for Stage T1 HCC lesions of at least 1cm in diameter, and assignment of a MELD score of 24 for lesions greater than or equal to 1cm in diameter with an AFP of 400 or higher. The report recommended that there should be no extra priority for lesions less than 1cm. For single lesions no greater than 6.5 cm that have been ablated, a MELD of 24 was recommended, with the caveat that candidates these be reevaluated every 3 months. These cases would require RRB prospective review.

The Committee was reminded that the Board had approved a Liver Committee recommendation to eliminate priority for Stage T1 HCC in November 2003; this had not been implemented at the time of the meeting. A motion was made to assign a MELD score of 14 for Stage T1 HCC tumors of at least 1 cm, with no increase in score at 3 month intervals accepted as a friendly amendment. It was noted that the implementation of the revised MELD curve as approved by the Board in November 2003 will decrease the score assigned to Stage T2 patients from 24 to 22. The motion was opposed by unanimous vote with one abstention; several members objected to altering a policy that had just been changed. The Committee voted unanimously with one abstention to reaffirm the existing HCC policy.

- **Consensus Report Action Item #4**

Finally, the MELD/PELD consensus conference report recommended that serum sodium data should be collected at each MELD/PELD update. This was based on analyses suggesting that low serum sodium (hyponatremia) is a surrogate for severe ascites, which impacts pre-transplant mortality. Serum sodium is not currently collected on the waiting list; this would allow further research to determine if this variable should be incorporated into a revised MELD/PELD score. The value would be collected every time the MELD/PELD score is updated. Committee members noted that this value should be available on every electrolyte panel, and thus each time creatinine is calculated. The Committee approved the following recommendation for consideration by the Board of Directors:

*** **RESOLVED, that serum sodium will be collected each time the MELD/PELD score is updated in UNetSM in accordance with the recertification schedule. These data will be collected for a six-month period, after which time an analysis will be conducted to determine its value to the MELD equation. This will be implemented upon completion of programming in the UNOS System.**

Committee vote: 21 in favor, 3 opposed, 0 abstentions.

During the May 2004 meeting, the Committee reviewed the programming specification document related to the collection of serum sodium for liver candidates. The valid range for collection of serum sodium was agreed by the Committee to be 105-170.

5. **Joint Pediatric/Liver and Intestinal Organ Transplantation Subcommittee.** The Joint Pediatric-Liver Subcommittee was formed in 2003 to collaboratively examine issues related to pediatric liver transplantation. Several items have been foremost on the agenda for this Subcommittee:
- A redefinition of Status 1 for pediatric patients;
 - Potential use of the MELD score for adolescent patients; and
 - Broader sharing for pediatric donors to pediatric candidates.

The discussions and recommendations relating to reach of these topics are highlighted below.

- **Redefinition of Status 1 for Pediatric Patients**

During the February 2004 meeting, Sue McDiarmid, MD, who serves on the Joint Subcommittee, discussed the existing Status 1 definition for pediatric liver candidates, noting that there appears to be consensus across the country and within UNOS Region 5 that Status 1 for children should be redefined. At the request of the Pediatric Transplantation Committee and Region 5, Dr. McDiarmid drafted a proposal for modifying the definition of Status 1. The proposal presented to the Liver Committee incorporated the recommendations of the Pediatric Committee. The goal of the redefinition was to choose objective and verifiable parameters that would define Status 1 for children. Data could be gathered that would allow these factors to be tested in the future, to ensure that the organs are being allocated to the sickest children. There would be four categories for pediatric Status 1: fulminant liver failure, primary non-function (PNF), hepatic artery thrombosis (HAT), and chronic liver disease.

For fulminant liver failure, one of three specified criteria must be met and the patient must be in the ICU:

1. Ventilator dependence;
2. Requiring dialysis or continuous veno-venous hemofiltration (CVVH) or continuous veno-venous hemodialysis (CVVD); or
3. An INR of 3.0 and a Glasgow coma scale of less than 10.

One addition to the definition of fulminant failure was the use of the Glasgow coma score as an objective assessment of encephalopathy. This score should be included on every pediatric ICU form and is well-validated, well-understood, and should help objectify encephalopathy, which is difficult to assess in small children. For PNF, several laboratory values (ALT, INR, total bilirubin) would be added to quantify the diagnosis. For HAT, the window for diagnosis was increased to 14 days. The Pediatrics Committee determined that additional laboratory values for determination of HAT were not necessary in children.

The most controversial category is that of Status 1 for chronic pediatric patients. Data provided previously to the Committee have suggested that a large number of pediatric patients with chronic liver disease are being transplanted in Status 1. The revised definition would require that a patient be in the ICU and meet one of four specific criteria: either on a ventilator, having a PELD/MELD score of at least 25 with significant gastrointestinal bleeding, having a PELD/MELD score of at least 25 with renal failure or renal insufficiency, or with a PELD/MELD score of at least 25 and a Glasgow coma score of less than or equal to 10. After the definition of Status 1 is more strictly defined, the Pediatric Committee felt that the allocation sequence for pediatric donors would also have to be modified to permit broader sharing of pediatric donors to pediatric recipients. John Lake, MD, Joint Subcommittee co-chair, reiterated that the Subcommittee had recommended that the status listing criteria should be changed significantly, such that the number of chronic Status 1 pediatric patients would be reduced. One issue discussed but not resolved by the Subcommittee was whether chronic Status 1 patients would be eligible for regional sharing.

Committee members noted that Policy 3.6.4.3 (Pediatric Liver Transplant Candidates with Metabolic Diseases) contains vague language (“metabolic disease which causes severe hyperammonemia such as the urea cycle defect”) in that severe hyperammonemia is not defined using a measurable value. Pediatric hepatologists define urea cycle defect by an enzyme analysis; it was suggested that this be replaced with identifiable enzyme deficiency. The Committee also recommended that the requirements related to GFR for patients with renal failure/renal insufficiency are unnecessary. The Committee approved the redefinition of Status 1 for pediatric liver candidates, with the recommended modifications, by a vote of 23 in favor, 0 opposed, 1 abstention.

During the May 2004 meeting, Dr. Merion reviewed analyses generated by the SRTR for the Joint Subcommittee conference call held on May 17, 2004, related to the definition of Status 1 for pediatric candidates and the allocation of pediatric donors to pediatric candidates (**Exhibit D**). The SRTR was asked to examine the PELD scores of chronic pediatric Status 1 candidates and the death rates on the waiting list for these candidates as compared to other Status 1 and PELD candidates. Death rates were analyzed for a cohort that included the chronic Status 1 candidates as well as one that excluded these candidates. The death rates for the chronic Status 1 candidates were lower than for Status 1 candidates with fulminant failure or PNF/HAT (0.929 versus 1.619 and 6.424). Non-status 1 exception candidates had much lower death rates (0.351). The Committee asked that the Status 1 cohort be further broken down for those Status 1 candidates who were granted Status 1 by exception. Combined liver-intestine candidates should also be excluded.

The Joint Subcommittee considered delineating Status 1 for pediatric candidates into 1A and 1B; Status 1A would be reserved for candidates with fulminant failure and primary non-function, HAT, or Wilson’s disease, while Status 1B would be reserved for candidates with the proposed stricter definition for chronic Status 1 candidates. This would enable livers to be directed to those pediatric candidates in most urgent need of an immediate transplant, as indicated by their higher death rates. Several members mentioned that, in certain regions, fulminant adult Status 1 candidates are being disadvantaged by the high number of chronic Status 1 pediatric candidates with low PELD scores, many who are Status 1 by RRB exception. The Committee discussed the possibility of limiting the pathway for pediatric candidates to become Status 1 by RRB exception.

The very ill chronic Status 1 pediatric candidates meeting the definition outlined by the Pediatric Committee were seen to be more urgent than other chronic candidates, and would need the higher urgency status in order to obtain size-matched donors in a timely manner. Concerns were expressed that creation of two urgent statuses may unnecessarily complicate the allocation system, with the comment that restriction of chronic Status 1 in and of itself should allow the sickest pediatric candidates to receive organs in a timely manner. Broader sharing for pediatric candidates would also serve to direct livers to the sickest children. The issue in pediatric cases is often related to the need for a size-matched organ, especially in small children, which can only be improved by increasing the sharing area. The SRTR was asked to tabulate the pediatric death rates by age, to determine the death rates in very small children versus other pediatric candidates.

The Committee entertained a motion that Status 1A should include adult and pediatric candidates with fulminant hepatic failure, PNF, HAT, or Wilson’s disease. The definition of fulminant hepatic failure (FHF) for pediatric candidates that had been outlined in the Region 5 sharing agreement would be used; however, the third provision that would allow a candidate to qualify for FHF would be changed to state “INR >2” rather than INR greater than 3, and the requirement for a Glasgow coma score greater than 10 would be eliminated for patients with FHF. Dr. McDiarmid noted that the definition of chronic Status 1 should include the more precise definition of renal failure

provided by the Pediatrics Committee, as “renal failure requiring dialysis, CVVD or CVVH,” and the phrase “renal insufficiency” should be stricken.

The motion was clarified as follows:

Motion: Status 1A will be defined for adults and pediatric candidates with FHF (as modified to lower the INR level to 2.0 and to remove the requirement for a Glasgow Coma Score less than 10), HAT/PNF and Wilson’s disease. Status 1B will be defined for pediatric candidates with chronic disease as redefined by the Pediatrics Committee. The mechanism for Status 1 by exception should be eliminated. This proposal will be circulated for public comment in August 2004.

Committee Vote: 15 in favor, 4 opposed, 2 abstentions.

- **Use of the MELD score for Adolescents**

The Joint Subcommittee also recommended the use of the MELD score for adolescents. Dr. Merion reviewed several SRTR analyses conducted for the Pediatric Committee. The first analysis examined patients listed during the first six months of the MELD/PELD allocation policy to determine if it would be better to use the MELD or PELD score for adolescents (age 12-17). In the majority of cases, the patient would have a higher MELD score than their PELD score. The average calculated MELD score was 5 points higher than their PELD score for pediatric patients without malignant neoplasms. Thus, the MELD score offers and increase in the opportunity for transplant in adolescent candidates. Based on the data presented, the Committee agreed to circulate this proposal for public comment (**Exhibit E**)

Review of Public Comment

As of April 29, 2004, 89 responses had been submitted to UNOS regarding this policy proposal. Of these, 34 (38.20%) supported the proposal, 10 (11.24%) opposed the proposal, and 45 (50.56%) had no opinion. Of the 44 who responded with an opinion, 34 (77.27%) supported the proposal and 10 (22.73%) opposed the proposal. Ten Regions supported the proposal, and one Region had no opinion. The Committee responded to two public comments submitted in opposition to the policy (**Exhibit E**). A programming specification document was also provided for the Committee’s review. The Committee agreed with a provision in the specification document that would allow collection of serum creatinine for patients aged 10 and higher, so that the patient will have a calculable MELD score by age 12.

Having reviewed the public and regional comments, the Committee submits the following resolution for consideration by the Board of Directors:

*** **RESOLVED, that Policies 3.6 (Pediatric Donor Liver Allocation Algorithm & Allocation Sequence for Patients with PELD or MELD Scores Less than or Equal to 6 (All Donor Livers)), 3.6.4.2 (Pediatric Patients Status), 3.6.4.2.1 (Pediatric Patient Reassessment and Recertification Schedule), 3.6.4.3 (Pediatric Liver Transplant Candidates with Metabolic Diseases), and 3.6.4.4.1 (Pediatric Liver Transplant Candidates with Hepatoblastoma) shall be amended as follows and implemented upon completion of programming in the UNOS System:**

[No changes to policy text until the following]

3.6 Pediatric Donor Liver Allocation Algorithm

Local

1. Pediatric Status 1 patients in descending point order
2. Adult Status 1 patients in descending point order

Regional

3. Pediatric Status 1 patients in descending point order
4. Adult Status 1 patients in descending point order

Local

5. All other pediatric patients with a PELD score or MELD score at or above a 50% risk of 3-month candidate mortality in descending order of mortality risk scores (probability of candidate death)
6. All other adult patients with a MELD score at or above a 50% risk of 3-month candidate mortality in descending order of mortality risk scores (probability of candidate death)
7. All remaining pediatric patients in descending order of mortality risk scores (probability of candidate death)
8. All remaining adult patients in descending order of mortality risk scores (probability of candidate death)

Regional

9. All other pediatric patients with a PELD score or MELD score at or above a 50% risk of 3-month candidate mortality in descending order of mortality risk scores (probability of candidate death)
10. All other adult patients with a MELD score at or above a 50% risk of 3-month candidate mortality in descending order of mortality risk scores (probability of candidate death)
11. All remaining pediatric patients in descending order of mortality risk scores (probability of candidate death)
12. All remaining adult patients in descending order of mortality risk scores (probability of candidate death)

National

13. Pediatric Status 1 patients in descending point order
14. Adult Status 1 patients in descending point order
15. All other pediatric patients with a PELD score or MELD score at or above a 50% risk of 3-month candidate mortality in descending order of mortality risk scores (probability of candidate death)
16. All other adult patients with a MELD score at or above a 50% risk of 3-month candidate mortality in descending order of mortality risk scores (probability of candidate death)
17. All remaining pediatric patients in descending order of mortality risk scores (probability of candidate death)
18. All remaining adult patients in descending order of mortality risk scores (probability of candidate death)

[No additional changes to policy text until the following]

Allocation Sequence for Patients with PELD or MELD Scores Less Than or Equal to 6 (All Donor Livers).

Adult patients and pediatric adolescent patients with a MELD score of 6 will be considered together with ~~all~~ pediatric patients <12 years with a PELD score less than or equal to 6. These patients will be initially ranked based upon waiting time. Those waiting list positions assigned to pediatric candidates based on this initial ranking (e.g., if the 3rd and 5th on the ranked list are held by pediatric patients) will then be re-distributed amongst the pediatric group based on PELD or MELD score, with the patient with the highest PELD or MELD, as applicable, score receiving the highest available pediatric ranking position. The next available pediatric ranking position will be assigned to the pediatric candidate with the next highest PELD or MELD score. Re-distribution of pediatric candidates continues until the pediatric candidate with the lowest PELD or MELD score is assigned the last pediatric ranking position.

[No additional changes to policy text until the following]

3.6.4 Degree of Medical Urgency. Each patient is assigned a status code or mortality risk score (probability of candidate death) which corresponds to how medically urgent it is that the patient receive a transplant.

3.6.4.1 Adult Patient Status. [No Changes]

3.6.4.2

Pediatric Patient Status. Medical urgency is assigned to a pediatric liver transplant patient (less than 18 years of age) based on either the criteria defined below for Status 1, or the patient's mortality risk score as determined by the prognostic factors specified in Table 2 and calculated in accordance with the Pediatric End-Stage Liver Disease Scoring System (PELD) for pediatric candidates <12 years or with the MELD System (defined above in Policy 3.6.4.1) for pediatric candidates 12-17 years. Based on the variables included in allocation score calculation in the MELD system, MELD scores may offer a more accurate picture of mortality risk and disease severity for adolescent candidates. Pediatric candidates 12-17 years will use a risk score calculated with the MELD system while maintaining other priorities assigned to pediatric candidates. A patient who does not meet the criteria for Status 1, does not have a risk of candidate mortality expressed by the PELD or MELD score that, in the judgment of the patient's transplant physician, appropriately reflects the patient's medical urgency or was listed at less than 18 years of age and remains on or has been returned to the Waiting List upon or after reaching age 18 may nevertheless be assigned to Status 1 or a higher PELD (less than 12 years of age) or MELD (12 – 17 years old) score upon application by his/her transplant physician(s) and justification to the applicable Regional Review Board that the patient is considered, by consensus medical judgment, using accepted medical criteria, to have an urgency and potential for benefit comparable to that of other patients listed as Status 1 or having the higher PELD or MELD score. The justification must include a rationale for incorporating the exceptional case as part of the Status 1 criteria or the PELD/MELD calculation. A report of the decision of the Regional Review Board and the basis for it shall be forwarded to UNOS for review by the Liver and Intestinal Organ Transplantation and Membership and Professional Standards Committees to determine consistency in application among and within Regions and continued appropriateness of the Status 1 and PELD or MELD criteria. ~~Data required to compute the MELD score (creatinine, INR, bilirubin) must be entered for all candidates 12 years and older.~~

Status	Definition
7	A pediatric patient listed as Status 7 is temporarily inactive. Patients who are considered to be temporarily unsuitable transplant patients are listed as Status 7, temporarily inactive.
1	A pediatric patient listed as Status 1 is located in the hospital's Intensive Care Unit (ICU) due to acute or chronic liver failure has a life expectancy without a liver transplant of less than 7 days and meets at least 1 of the following criteria: <ul style="list-style-type: none">(i) Fulminant hepatic failure defined as the onset of hepatic encephalopathy within 8 weeks of the first symptoms of liver disease. The absence of pre-existing liver disease is critical to the diagnosis. While no single clinical observation or laboratory test defines fulminant hepatic failure, the diagnosis is based on the finding of stage II encephalopathy (i.e., drowsiness, inappropriate behavior, incontinence with asterixis) in a patient with severe liver dysfunction. Evidence of severe liver dysfunction may be manifest by some or all of the following symptoms and signs: asterixis (flapping tremor), hyperbilirubinemia (i.e., bilirubin>15mg%), marked prolongation of the INR (i.e., >2.5), or hypoglycemia.(ii) Primary non-function of a transplanted liver within 7 days of implantation.(iii) Hepatic artery thrombosis in a transplanted liver within 7 days of implantation.(iv) Acute decompensated Wilson's disease.

- (v) On mechanical ventilator.
- (vi) Upper gastro-intestinal bleeding requiring at least 10 cc/kg of red blood cell replacement which continues or recurs despite treatment.
- (vii) Hepatorenal syndrome: The presence of progressive deterioration of renal function in a patient with advanced liver disease requiring hospitalization for management, with no other known etiology of renal insufficiency, and a rising serum creatinine 3 times baseline. In addition to these major criteria, the patient should meet at least one of the following: a) urine volume < 10 ml/kg/d; b) urine sodium < 10 mEq/l; or c) urine osmolality > plasma osmolality (U/P ratio > 1.0).
- (viii) Stage III or IV encephalopathy unresponsive to medical therapy.
- (ix) Refractory Ascites/Hepato-Hydrothorax: Severe persistent ascites or hepatohydrothorax, defined as any one of the following: unresponsive to diuretic and salt restriction therapy leading to respiratory distress, or requiring supplemental tube feeding, or requiring parenteral nutrition, or requiring supplemental oxygen, or requiring paracentesis.
- (x) Biliary sepsis requiring pressor support of 5 mcg/kg/min of dopamine or greater.

With the exception of hospitalized pediatric liver transplant candidates with Ornithine Transcarbamylase Deficiency (OTC) or Crigler-Najjar Disease Type I, patients who are listed as a Status 1 automatically revert back to their most recent PELD or MELD score after 7 days unless these patients are relisted as Status 1 by an attending physician. Patients must be listed with PELD/MELD laboratory values in accordance with Policy 3.6.4.2.1 (Pediatric Patient Recertification and Reassessment Schedule) at the time of listing. A patient listed as Status 1 shall be reviewed by the applicable UNOS Regional Review Board. A completed Liver Status 1 Justification Form must be received by UNOS on UNetSM for a patient's original listing as a Status 1 and each relisting as a Status 1. If a completed Liver Status 1 Justification Form is not entered into UNetSM when a candidate is registered as a Status 1, the candidate shall be reassigned to their most recent PELD or MELD score. A relisting request to continue a Status 1 listing for the same patient waiting on that specific transplant beyond 14 days accumulated time will result in a review of all local Status 1 liver patient listings.

All other pediatric liver transplant candidates on the UNOS Patient Waiting List shall be assigned a mortality risk score calculated in accordance with the PELD (0-11years) or MELD (12-17 years) scoring system. For each liver candidate registration, the listing transplant center shall enter data on the UNOS computer system for the prognostic factors specified in Table 2 for pediatric candidates <12 years or Table 1 for pediatric candidates 12-17 years. These data must be based on the most recent clinical information (e.g., laboratory test results and diagnosis) and include the dates of the laboratory tests.

[No additional changes to policy text until the following]

3.6.4.2.1 Pediatric Patient Reassessment and Recertification Schedule. The appropriateness of the PELD or MELD score assigned to each patient listing shall be re-assessed and recertified by the listing transplant center to UNOS in accordance with the following schedule:

Pediatric Patient Reassessment and Recertification Schedule

Status 1	Status recertification every 7 days.	Laboratory values must be no older than 48 hours.
PELD/MELD Score 25 or greater	Status recertification every 14 days.	Laboratory values must be no older than 72 hours.
Score <=24 but > 18	Status recertification every 1 month.	Laboratory values must be no older than 7 days.
Score <= 18 but >=11	Status recertification every 3 months.	Laboratory values must be no older than 14 days.
Score <= 10	Status recertification every 12 months.	Laboratory values must be no older than 30 days.

This reassessment and recertification must be based on the most recent clinical information (e.g., laboratory test results and diagnosis) including the dates of the laboratory tests. In order to recertify, laboratory values must not be older than the "age of laboratory values" specified in the chart above. In order to change a PELD/MELD score voluntarily, all laboratory values must be obtained on the same day. UNOS shall notify the listing transplant center of the need to reassess and recertify a patient's PELD/MELD score within 48 hours of the applicable deadline indicated in the recertification schedule. If a patient is not recertified in accordance with the schedule, the patient shall be re-assigned to their previous lower PELD/MELD score. If a patient has no previous lower PELD/MELD score, and is not recertified in accordance with the schedule, the patient shall be reassigned to a PELD/MELD score of 6.

[No additional changes to policy text until the following]

3.6.4.3 Pediatric Liver Transplant Candidates with Metabolic Diseases (e.g., OTC or Crigler-Najjar Disease Type I). A pediatric liver transplant candidate with a metabolic disease such as Ornithine Transcarbamylase Deficiency (OTC) or Crigler-Najjar Disease Type I shall be assigned the medical urgency ranking, either Status 1 or the PELD (less than 12 years old) or MELD (12 – 17 years old) score, that, in the judgment of the patient’s transplant physician, appropriately reflects the patient’s medical urgency upon application by his/her transplant physician(s) and justification to the applicable Regional Review Board. The patient, if not already a Status 1, may be upgraded to a Status 1 if the patient is hospitalized for an acute exacerbation of their disease. The patient shall remain a Status 1 as long as he or she remains hospitalized. Decisions by the Regional Review Boards in these cases shall be guided by standards developed jointly by the Liver/Intestinal Organ Transplantation and Pediatric Transplantation Committees. Status 1 cases must receive retrospective review by the applicable RRB. Those cases where a higher PELD or MELD score is requested must receive prospective approval by the applicable RRB within twenty-one days after application; if approval is not given within twenty-one days, the patient’s transplant physician may list the patient at the higher PELD or MELD score, subject to automatic referral to the Liver and Intestinal Organ Transplantation and Membership and Professional Standards Committees.

[No additional changes to policy text until the following]

3.6.4.4.1 Pediatric Liver Transplant Candidates with Hepatoblastoma. A pediatric patient with non-metastatic hepatoblastoma who is otherwise a suitable candidate for liver transplantation may be assigned the medical urgency ranking, either Status 1 or the PELD (less than 12 years old) or MELD (12 - 17 years old) score, that, in the judgment of the patient’s transplant physician, appropriately reflects the patient’s medical urgency upon application by his/her transplant physician(s) and justification to the applicable Regional Review Board. Decisions by the Regional Review Boards in these cases shall be guided by standards developed jointly by the Liver/Intestinal Organ Transplantation and Pediatric Transplantation Committees. Status 1 cases must receive retrospective review by the applicable RRB. Those cases where a higher PELD (less than 12 years old) or MELD (12 - 17 years old) score is requested must receive prospective approval by the applicable RRB, within twenty-one days after application;

if approval is not given within twenty-one days, the patient's transplant physician may list the patient at the higher PELD (less than 12 years old) or MELD (12 – 17 years old) score, subject to automatic referral to the Liver and Intestinal Organ Transplantation and Membership and Professional Standards Committees.

[No further changes to policy text.]

Committee Vote: 16 in favor, 0 opposed, 0 abstentions.

- ***Broader Sharing of Pediatric Donors for Pediatric Candidates***

The Committee discussed the issue of allocation of pediatric donors to pediatric candidates during its February 2004 meeting. An SRTR analysis examined the impact of regional allocation of pediatric donors to pediatric candidates (**Exhibit F**). Following Status 1 candidates, the current policy allocates pediatric donors first to local pediatric candidates whose mortality risk is 50% or higher (PELD=46), then to local adult candidates whose mortality risk is 50% or higher (MELD =33), then to remaining local pediatric candidates and remaining local adult candidates. The sequence is essentially replicated for candidates on the regional and National lists. The LSAM model was used to adjust the threshold for pediatric candidates to PELD scores of 10, 20, 30, and 40. The 50% threshold was maintained for adult candidates. Sharing for pediatric candidates occurred either at the Regional level prior to adult candidates at the Regional level ("Regional-regional), or prior to adult candidates at the local level prior to local sharing for adult candidates ("Regional-Local"). The increase in pediatric candidates receiving pediatric donors ranged from 21 to 29. The total number of waiting list and post-transplant deaths in pediatric candidates ranged from 64-67. The Regional-Local system would appear to provide greater benefit to pediatric candidates.

Dr. McDiarmid reported that, after reviewing modeling data from the SRTR, the Joint Subcommittee had recommended a proposal termed the "Regional-Local" proposal, under which pediatric donors would be allocated to pediatric candidates regionally above a specific threshold (10 or 20), followed by local adults above the 50% mortality cut point, then to regional pediatric candidates below the threshold (10 or 20), regional adults above the 50% mortality cut point, local adults below the cut point, regional adults below the 50% cut point, and the so forth. Allocation to local and regional Status 1s would occur first. The Pediatric Committee had selected a threshold of 10, which increased the number of pediatric transplants and did not yield result significantly different from the threshold of 20.

This threshold was used as a starting point for Liver Committee discussion. Pediatric patients demonstrate a higher mortality at PELD scores of 10-20, versus less than 10. The Committee was not clear regarding the specific sequence of allocation and how it would interact with the proposal for regional sharing for MELD/PELD scores greater than 15. A revised policy could be structured to offer pediatric organs first to sick children (as defined by some PELD threshold) in the Region, followed by local patients with MELD/PELD scores of 15 or higher, then to Regional patients with a MELD/PELD score of 15 or higher. Adolescents would use the MELD score and be ranked with adults. It was noted that a primary issue in transplantation for small children is donor organ size matching, and that perhaps a 17-year old donor should not be given allocation priority for a child with a low PELD score. However, a policy under which 17 year old donors are allocated to small children may encourage split transplantation of the most ideal donors.

It was noted that the Liver Committee had proposed several changes to the allocation policy subsequent to the Pediatric Committee's recommendation for broader sharing for pediatric donors, further complicating the selection of an appropriate threshold for pediatric donor allocation. One suggested proposal would offer pediatric livers first to Status 1s locally and regionally, then to all regional PELD candidates (12 and under), then to MELD candidates (including adolescents age 12-17) above a score of 15, then to regional MELD candidates greater than 15, and so forth. This proposal addresses issues of size matching and access for small children. This proposal should be modeled to assess the potential impact. The Committee discussed the importance of moving forward with the redefinition of pediatric Status 1 and the revised pediatric sharing algorithm at the same time. With a restriction of Status 1, it is important to broaden the access to pediatric donors. It was suggested that both could go out for public comment; however, Committee members were not comfortable doing so without modeling the proposed pediatric donor algorithm. The Committee voted unanimously that the proposal should be sent back to the Joint Subcommittee for further refinement and the final proposal from the Subcommittee should be modeled by the SRTR

and brought back to the Committee in May. By unanimous Committee vote, the proposed changes to the definition of pediatric Status 1 were put on hold until further data could be presented at the May 2004 meeting. The Committee also voted unanimously that it supported the concept of broader sharing for pediatric donors into pediatric recipients.

During the May 2004 meeting, the Committee entertained a motion related to the allocation of pediatric donors. For a pediatric donor, the liver would be allocated first to local pediatric Status 1A candidates, then to local adult Status 1 candidates. The liver would then be offered to regional pediatric Status 1A patients, then to Regional adult Status 1 patients, followed by local and regional pediatric Status 1B candidates, regional pediatric candidates with a MELD/PELD greater than 10, and then to any remaining local, regional, and national candidates. The threshold of 10 was based upon SRTR LSAM modeling that showed that the difference in the number of pediatric patients receiving transplants did not vary much for a threshold of 10 versus 20 or 30, and that the largest impact was due to regional sharing. Deaths in the adult population did not vary under the different scenarios. A pediatric donor would remain defined as one less than 18 years of age, which was selected originally (rather than a lower age) to encourage splitting. The Committee discussed the possibility of defining a pediatric donor based upon weight rather than age. The Committee discussed the proposal with the assumption that the policy that would assign MELD scores to adolescent candidates would be approved.

Motion: Pediatric donors will be allocated as described below. This proposal will be circulated for public comment in August 2004.

1. Local Pediatric Status 1A Candidates
2. Local Adult Status 1A Candidates
3. Regional Pediatric Status 1A Candidates
4. Regional Adult Status 1 Candidates
5. Local Pediatric Status 1B Candidates
6. Regional Pediatric Status 1B Candidates
7. Regional Pediatric Candidates with MELD/PELD Scores >10
8. Local M/P Candidates
9. Regional M/P Candidates
10. National M/P Candidates

Committee Vote: 21 in favor, 0 opposed, 0 abstentions

6. **Modifications to Policy 3.6.2.1 (Allocation of Blood Type O Donors).** In October 2003, the Committee proposed two modifications to Policy 3.6.2.1 (Allocation of Blood Type O Donors). The first would increase the threshold for allocation of blood type O donors to blood type B candidates from a MELD/PELD score of 20 to a MELD/PELD score of 30. This is intended to better equalize the donor pool for O and B candidates. It was predicted to reduce the number of blood type O livers transplanted into blood type B patients and to increase the number of blood type O livers transplanted into blood type O recipients by the same number, without affecting the death rate in either population. The second modification would allow any remaining blood type compatible candidates to appear on the match run list for blood type O donors after the blood type O and B candidate list has been exhausted at the regional and national level. Under current policy, these patients do not appear on the match run and are therefore not eligible for organ offers. This may reduce organ wastage in some instances. The proposals were approved by the Board of Directors in November 2003, for implementation concurrent with public comment. During the February 2004 meeting, the Committee agreed by unanimous vote that these two proposals could be implemented together. The Committee confirmed that the programming specification document related to listing ABO compatible candidates on O donor liver matches was correct. A complete description of both proposals can be found in **Exhibits G and H**.

Review of Public Comment; Proposed Modifications to Policy 3.6.2.1 (Allocation of Blood Type O Donors).

As of April 29, 2004, 89 responses had been submitted to UNOS regarding this policy proposal. Of these, 38 (42.70%) supported the proposal, 11 (12.36%) opposed the proposal, and 40 (44.94%) had no opinion. Of the 49 who responded with an opinion, 38 (77.55%) supported the proposal and 11 (22.45%) opposed the proposal. Region 2 did not support the policy because it was felt that the data did not indicate that doing so would benefit either group of patients. The vote in Region 3 was somewhat divided (11 in favor, 5 opposed, 1 no opinion) but no reason was

provided for this. The Committee responded to four comments submitted in opposition to the policy (**Exhibit G**). A programming specification document was also provided for the Committee's review.

Having reviewed and addressed the comments, the Committee recommends the following for consideration by the Board of Directors:

***** RESOLVED, that subsequent to consideration of the public comment, Policy 3.6.2.1 (Allocation of Blood Type O Donors) shall be amended as follows, and implemented upon completion of programming in the UNOS System:**

3.6.2.1 Allocation of Blood Type O Donors. With the exception of Status 1 patients, blood type O donors may only be allocated to blood type O patients, or B patients with a MELD or PELD score greater than or equal to ~~29~~ 30.

Committee vote: 15 in favor, 0 opposed, 0 abstentions.

Review of Public Comment: Proposed Modifications to Policy 3.6.2.1 (Allocation of Blood Type O Donors).

As of April 29, 2004, 90 responses had been submitted to UNOS regarding this policy proposal. Of these, 46 (51.11%) supported the proposal, 2 (2.22%) opposed the proposal, and 42 (46.67%) had no opinion. Of the 48 who responded with an opinion, 46 (95.83%) supported the proposal and 2 (4.17%) opposed the proposal. All of the Regions supported the proposal. The Committee responded to one comment submitted in opposition to the policy (**Exhibit H**). A programming specification document was also provide for the Committee's review.

Having reviewed and addressed the public, the Committee submits the following resolution for consideration by the Board of Directors:

***** RESOLVED, that subsequent to consideration of the public comment, Policy 3.6.2.1 (Allocation of Blood Type O Donors) shall be amended as follows, and implemented upon completion of programming in the UNOS System:**

3.6.2.1 Allocation of Blood Type O Donors. With the Exception of Status 1 patients, blood type O donors may only be allocated to blood type O patients, or B patients with a MELD or PELD score greater than or equal to 2 30. Any remaining blood type compatible candidates will appear on the match run list for blood type O donors after the blood type O and B candidate list has been exhausted at the regional and national level.

Committee Vote: 17 in favor, 0 opposed, 0 abstentions.

7. Memorandum from the UNOS Policy Compliance Department Regarding Subtyping of Blood Group A Liver Donors. Policy 2.2.7.3 requires subtyping for Group A liver donors. Policy 3.6.2 (Blood Type Similarity Stratification/Points) refers specifically to subtype A₂. During on-site visits, UNOS auditors have noted variations in how Group A subtypings are reported by HLA laboratories. In some cases, a non- A₁ is reported as an A₂ while others would report this results as an A. This lack of consistency was said to hinder the effect of 3.6.2, which allots 5 points to Blood type O Status 1 candidates who are willing to receive a liver from an A₂ donor. The memorandum asked that Policy 6.6.2 be amended to state "non-A₁," or that the Committee provide other guidance as to how the subtyping results should be interpreted. The Committee unanimously agreed to accept the proposed language, and submits the following resolution for consideration by the Board of Directors:

***** RESOLVED, that Policy 3.6.2 shall be modified as follows, and implemented upon completion of programming in the UNOS System:**

Policy 3.6.2 Blood Type Similarity Stratification/Points. For Status 1 transplant candidates, patients with the same ABO type as the liver donor shall receive 10 points. Candidates with compatible but not identical ABO types shall receive 5 points, and candidates with incompatible types shall receive 0 points. Blood type O candidates who will accept a liver from ~~an~~ a A₂ non-A₁ blood type donor shall receive 5 points for ABO incompatible matching. Within each MELD/PELD score, donor livers shall be offered to transplant

candidates who are ABO-identical with the donor first, then to candidates who are ABO-compatible, followed by candidates who are ABO-incompatible with the donor.

Committee vote: 24 in favor, 0 opposed, 0 abstentions.

8. **Proposed Modifications to Policy 3.6.4.4.1 (Adult Patient Reassessment and Recertification Schedule) and 3.6.4.2.1 (Pediatric Patient Reassessment and Recertification Schedule).** In November 2003, the Board of Directors approved a policy modification for implementation concurrent with public comment that specifies that patients whose MELD/PELD scores remain uncertified will be reassigned to a MELD/PELD score of 6. Pediatric patients whose uncertified score is less than 6 would remain at that lower, uncertified PELD score. Under the current policy, some patients who are uncertified are allowed to remain indefinitely at an uncertified MELD/PELD score. A complete description of the policy proposal distributed for public comment in March 2004 is contained in **Exhibit I**. As of April 29, 2004, 89 responses had been submitted to UNOS regarding this policy proposal. Of these, 39 (43.82%) supported the proposal, 0 (0%) opposed the proposal, and 50 (56.18%) had no opinion. Of the 39 who responded with an opinion, 39 (100.00%) supported the proposal and 0 (0%) opposed the proposal. All of the Regions supported the proposal. No public comments were submitted in opposition to the policy, although 2 Regions proposed modifications that were not accepted by the Committee (**Exhibit I**). A programming specification document was also provided for the Committee's review.

Having reviewed the regional comments, the Committee submits the following resolution for consideration by the Board of Directors:

*** **RESOLVED, that Policy 3.6.4.4.1 (Adult Patient Reassessment and Recertification Schedule) and 3.6.4.2.1 (Pediatric Patient Reassessment and Recertification Schedule) shall be amended as follows and implemented upon completion of programming in the UNOS System.**

- 3.6.4.1.1 Adult Patient Reassessment and Recertification Schedule.** The appropriateness of the MELD score assigned to each patient listing shall be re-assessed and recertified by the listing transplant center to UNOS in accordance with the following schedule:

Adult Patient Reassessment and Recertification Schedule

Status 1	Status recertification every 7 days.	Laboratory values must be no older than 48 hours.
MELD Score 25 or greater	Status recertification every 7 days.	Laboratory values must be no older than 48 hours.
Score <= 24 but > 18	Status recertification every 1 month.	Laboratory values must be no older than 7 days.
Score <= 18 but >=11	Status recertification every 3 months.	Laboratory values must be no older than 14 days.
Score <= 10 but > 0	Status recertification every 12 months.	Laboratory values must be no older than 30 days.

This reassessment and recertification must be based on the most recent clinical information (e.g., laboratory test results and diagnosis), including the dates of the laboratory tests. In order to re-certify, laboratory values must not be older than the "age of laboratory values" specified in the chart above. In order to change a MELD score voluntarily, all laboratory values must be obtained on the same day. UNOS shall notify the listing transplant center of the need to reassess and recertify a patient's MELD score within 48 hours of the applicable deadline indicated in the recertification schedule. If a patient is not recertified in accordance with the schedule, the patient shall be re-assigned to their previous lower MELD score. The patient may remain at that previous lower score for the period allowed based upon the recertification schedule for the previous lower score, minus the time spent in the uncertified score. If the patient remains uncertified past the recertification due date for the previous lower score, the patient will be assigned a MELD score of 6. If a patient has no previous lower MELD score, and is not recertified in accordance with the schedule, the patient shall be reassigned to a MELD score of 6.

3.6.4.2.1 Pediatric Patient Reassessment and Recertification Schedule. The appropriateness of the PELD score assigned to each patient listing shall be re-assessed and recertified by the listing transplant center to UNOS in accordance with the following schedule:

Pediatric Patient Reassessment and Recertification Schedule

Status 1	Status recertification every 7 days.	Laboratory values must be no older than 48 hours.
PELD Score 25 or greater	Status recertification every 14 days.	Laboratory values must be no older than 72 hours.
Score <=24 but > 18	Status recertification every 1 month.	Laboratory values must be no older than 7 days.
Score <= 18 but >=11	Status recertification every 3 months.	Laboratory values must be no older than 14 days.
Score <= 10	Status recertification every 12 months.	Laboratory values must be no older than 30 days.

This reassessment and recertification must be based on the most recent clinical information (e.g., laboratory test results and diagnosis) including the dates of the laboratory tests. In order to recertify, laboratory values must not be older than the "age of laboratory values" specified in the chart above. In order to change a PELD score voluntarily, all laboratory values must be obtained on the same day. UNOS shall notify the listing transplant center of the need to reassess and recertify a patient's PELD score within 48 hours of the applicable deadline indicated in the recertification schedule. If a patient is not recertified in accordance with the schedule, the patient shall be re-assigned to their previous lower PELD score. The patient may remain at that previous lower score for the period allowed based upon the recertification schedule for the previous lower score, minus the time spent in the uncertified score. If the patient remains uncertified past the recertification due date for the previous lower score, the patient will be assigned a PELD score of 6. If a patient has no previous lower PELD score, and is not recertified in accordance with the schedule, the patient shall be reassigned to a PELD score of 6, or will remain at the uncertified PELD score if it is less than 6.

Committee Vote: 18 in favor, 0 opposed, 0 abstentions.

9. **Region 5 Subcommittee Report.** The Region 5 Subcommittee was charged with providing a recommendation or set of options that would address the problems with Region 5's Status 1 liver sharing agreement. The Region 5 Subcommittee met via teleconference in January 2003 to review historical sequence of events, all proposals circulated to the Region, and the data reviewed by the Region 5 membership in their assessment of the sharing agreement. A full description of these deliberations is contained in **Exhibit J**. Marlon Levy, MD, chair of the Subcommittee made the following recommendations to the full Committee during the February 5, 2004 meeting:

1. Eliminate all paybacks except as noted below.
2. Pediatric Status 1 with Chronic Disease:
 - a) If on waiting list greater than 2 weeks, mandated prospective review and approval by region 5 Regional Review Board for continued Status 1 designation.
 - b) If remains as Status 1 more than two weeks, a payback debt is generated when child is transplanted.
3. Primary Non-Function:
 - a) A payback debt is generated when a mandatory share liver is used to retransplant a patient for the diagnosis of Primary Non-Function.
4. Paybacks for above situations:
 - a) Fall after Status 1 offers in the allocation algorithm.
 - b) Are OPO to OPO.
 - c) Debtee OPO has three offers to cancel a debt by accepting a payback liver. If after third offer a liver is not accepted the debt is cancelled. Appeal of appropriateness of offers are to Region 5 Regional Review Board.
 - d) Donor Network of Arizona is a full participant in this modified agreement.

The agreement would also include yearly review of debts by OPO, PNF rates by center, Status 1 listing by center, acute retransplant rate by center, death on waitlist by center, and MELD at transplant by center, to be carried out by Liver and Intestinal Organ Transplantation Committee.

During the February 2004 meeting, several representatives from transplant programs and OPOs in the Region were present or participated via teleconference. In addition to five Committee members from Region 5, six individuals representing three OPOs and three transplant centers were present or on the telephone. Each individual was given an opportunity to present his or her views of the sharing agreement. Their presentations are summarized in **Exhibit J**. After extensive discussion, a proposal including the following provisions were put to a vote:

- Tighter definitions for Status 1
- Eliminate paybacks
- Require retrospective review of all Status 1 listings
 - For PNF, require that labs be drawn at 24 hours to 7 days post-transplant, all from the same draw; alter the INR requirement to 3 to be consistent with the pediatric proposal.
- Evaluate the sharing agreement in 6 months and 1 year after implementation.

Committee Vote: 20 in favor, 0 opposed, 0 abstentions.

Committee members representing Region 5 were not included in the final discussion and vote. This proposal was circulated for public Comment in March 2004 (**Exhibit J**).

Review of Public Comment

As of April 29, 2004, 89 responses had been submitted to UNOS regarding this policy proposal. Of these, 22 (24.72%) supported the proposal, 8 (8.99%) opposed the proposal, and 59 (66.29%) had no opinion. Of the 30 who responded with an opinion, 22 (73.33%) supported the proposal and 8 (26.67%) opposed the proposal. Ten Regions voted in favor of the policy (one as amended by the Region), with one opposed. The Committee responded to comments submitted in opposition to the policy (**Exhibit J**). A programming specification document was also provided for the Committee's review.

Region 8 voiced concerns that approving this proposal would serve as a precedent for the Liver/Intestine Committee to dictate regional sharing agreements. The Committee responded that Region 5 has not been able to reach consensus on this issue. The Liver Committee and the Board have repeatedly tried to obtain consensus in Region 5; the Committee's intervention was seen as a last resort. Region 5 asked that the definition of HAT be extended to 10 days; this was accepted by the Committee. The region also voted to keep the payback provision for six months, by a vote of 16 in favor and 12 opposed. The Committee did not support this request, noting that the policy will be evaluated at six months. Existing paybacks at the time the agreement is implemented will be paid back until the debts are zeroed out. The Committee felt that the revised definition of pediatric Status 1 should apply to the Region 5 sharing agreement. The regional representatives were in agreement with this decision. The Committee submits the following for consideration by the Board of Directors:

***** RESOLVED, that subsequent to consideration of the public comment, the Region 5 sharing agreement shall be amended as described below and implemented upon completion of programming in the UNOS System:**

Proposed Region 5 Status 1 Sharing Agreement

- The Agreement will use the revised definitions for Status 1 as described in Tables 1 and 2
- Paybacks will be eliminated. Existing paybacks at the time the agreement is implemented will be paid back until the debts are zeroed out.
- There will be retrospective review of all Status 1 listings
- The sharing agreement will be evaluated at 6 months and 1 year after implementation.

Table 1. Redefinition for Pediatric Status 1 for Region 5

A pediatric patient listed as Status 1A or 1B is located in the hospital's Intensive Care Unit (ICU). There are four allowable diagnostic groups (i) fulminant liver failure (ii) primary non function (iii) hepatic artery thrombosis and (iv) chronic liver disease. Within each diagnostic group specific conditions must be met to allow for listing a pediatric patient at Status 1A or 1B without prospective Regional Review Board approval.

Status 1A

- (i) Fulminant hepatic failure. Fulminant liver failure is defined as the onset of hepatic encephalopathy within 8 weeks of the first symptoms of liver disease. The absence of pre-existing liver disease is critical to the diagnosis. One of three criteria below must be met to list a pediatric patient in the ICU with fulminant liver failure: (1) ventilator dependence (2) requiring dialysis or continuous veno-venous hemofiltration (CVVH) or continuous veno-venous hemodialysis (CVVD) (3) ~~INR > 3.0 and Glasgow coma score < 10.~~
- (ii) Primary non-function of a transplanted liver. The diagnosis is made within 7 days of implantation. Additional criteria to be met for this indication must include 2 of the following: ALT > 2000, INR > 3.0 or total bilirubin > 10 mg/dl
- (iii) Hepatic artery thrombosis. The diagnosis must be made in a transplanted liver within 14 days of implantation.
- (iv) Acute decompensated Wilson's disease.

Status 1B**

(↔) Chronic liver disease. Pediatric patients with chronic liver disease and in the ICU can be listed at Status 1B if one of the following criteria is met:

- (1) On a mechanical ventilator
- (2) Have a PELD score of >25 or MELD score of >25 for adolescent candidates (12-17 years) and gastrointestinal bleeding requiring at least 30 cc/kg of red blood cell replacement within the previous 24 hours
- (3) Have a PELD score of >25 or MELD score of >25 for adolescent candidates (12-17 years), and (i) renal failure defined as dialysis, CVVH or CVVD or (ii) ~~renal insufficiency.~~
- (4) Have a PELD >25 or MELD score of >25 for adolescent candidates (12-17 years) and a Glasgow coma score < 10

** Other pediatric patients that may qualify for Status 1 in Policies 3.6.4.2, 3.6.4.3, and 3.6.4.4.1 (i.e., metabolic diseases such as OTC and Crigler-Najjar Disease Type I, and hepatoblastoma) may apply for Status 1B.

Table 2. Redefinition of Adult Status 1 for Region 5

- A. Acute liver failure
- B. Primary non-function ≤ 10 days as defined by:
 - 1. AST ≥ 5000 and one or both of the following:
 - 2A. INR ≥ 3.0
 - 2B. Acidosis: pH ≤ 7.3 and/or Lactate $\geq 2x$ normal
 - 3. Anhepatic patient (stands alone)

For PNF, labs must be drawn at 24 hours to 7 days post-transplant, all from the same draw

- C. HAT ≤ 7 10 days as defined by PNF above; HAT not meeting PNF criteria will be listed at a MELD of 40 to confine such patients to the local OPO and avoid affecting the entire region (does not apply to living donor or split organs)
- D. Acute Wilson's Disease

Committee Vote: 16 in favor, 0 opposed, 4 abstentions.

Proposal to Split Region 5

During the May 2004 meeting, Robert Gish, MD, reported that a request to split the Region had been made during the April 2004 Region 5 meeting. The Region would be divided into the major coastal OPOs as one Region, and the remaining OPOs as another Region. The Region 5 membership voted to postpone the discussion until the Fall 2004 meeting, when data could be presented regarding the effect of the proposal. A Region 5 Subcommittee was appointed to determine the appropriate data to be considered, and a request for LSAM modeling was made. The Liver Committee felt that a formal proposal should be made, either to the Liver Committee or the Executive Committee, perhaps before any analysis is performed. The proposal should state what the Region is trying to accomplish or correct, and address the how the proposal would meet the provisions of the Final Rule. Michael Dreis, PharmD, from the DoT, noted that smaller regions are not necessarily in conflict with the Final Rule. Given the performance goals identified by the Subcommittee, the Final Rule would indicate that the goals should be met using the broadest sharing areas as possible. Therefore, the proposal must demonstrate how a smaller area would meet the goals of the proposal (e.g., reduction in deaths). There was a sense that the proposal, once developed, should be forwarded to the Executive Committee, as this would affect other organ allocation systems and the administration of the regions. The Subcommittee should include representation from other organ systems.

10. **Region 7 Status 1 Alternative System Review.** During the February 2004 meeting, the Committee reviewed a proposed modification to the payback system included in the Region 7 sharing agreement (**Exhibit K**). Under the modification, donors meeting certain criteria (considered expanded criteria donors) would not be offered for payback. It was reported that the Region supports this proposal. The Committee approved the following resolution for consideration by the Board of Directors:

*** **RESOLVED, that the proposed modification to the Region 7 sharing agreement, as set forth in Exhibit K, shall be approved and implemented upon completion of programming in the UNOS System.**

Committee vote: 22 in favor, 0 opposed, 2 abstentions.

11. **Missouri Statewide Liver ALU.** Dean Kappel, CEO of Mid-America Transplant Services (MTS) presented a proposal to create an alternative local unit (ALU) for the state of Missouri (**Exhibit L**) during the May 2004 meeting. Mr. Kappel described the proposed allocation of livers recovered in Missouri and the rationale for creating an ALU. There are two OPOs that serve Missouri, MTS and Midwest Transplant Network (MTN). Robert Linderer, Executive Director of MTN and an at-large member of the Liver Committee, was a co-presenter. MTS serves approximately half the state of Missouri, while MTN serves the other half of Missouri and the state of Kansas. For Missouri donors, after Status 1 candidates in Region 8, livers would go first to candidates on the recovering OPO's list, then to candidates on the other OPO's list, prior to allocation outside the state but within the Region. Mr. Kappel noted that, for 1997-2002, 74% of liver recipients residing in Missouri were listed in Missouri. In 2002-

2003, 25% of patients listed within the MTS service area resided in the MTN service area. Eighty-eight percent of Missouri Medicaid patients were transplanted in Missouri for that period. The ALU is intended to provide equal access to Missouri residents for Missouri donors, and to improve waiting time disparities seen in the MTS service area. Mr. Kappel noted that all of the states in Region 8 have the entire state as the first level of allocation, with the exception of Missouri. The ALU was seen as a way to avoid pending State legislation that would require that Missouri organs be offered first to Missouri residents. Mr. Kappel reported that the current allocation for pediatric liver would still apply.

The proposal was approved by all of the parties subject to the agreement, and by Region 8 by a vote of 14 in favor and 9 opposed. Those opposed included representatives from Nebraska and Colorado. Committee members were uncertain whether the proposal would adversely impact patients in Nebraska and Colorado. Some members were concerned that the proposal restricts sharing. It was reported that the Patient Affairs Committee voted to approve the proposal, on the basis that Missouri patients are penalized due to their residence under the present system. Having discussed the proposal, the Committee recommends the following for consideration by the Board of Directors:

***** RESOLVED, that the Missouri Statewide Alternate Sharing Unit, as set forth in Exhibit L, shall be approved and implemented upon completion of programming in the UNOS System.**

Committee Vote: 9 in favor, 7 opposed, 4 abstentions.

12. **Automatic Relisting of Living Donor Recipients.** Currently, UNetSM is programmed to automatically relist any candidate who is removed from the liver waiting list for a living donor transplant; the candidate is listed in inactive status, and will retain their original listing date for purposes of waiting time if activated. This is based upon Policy 3.6.6 (Removal of Liver Candidates from Liver Waiting Lists When Transplanted or Deceased), which states that, "If a liver transplant candidate on the UNOS Patient Waiting List has received a transplant from a living donor, the listing center, or centers if the patient is multiple listed, shall immediately transfer that patient to inactive status until the patient requires a subsequent transplant or one year following the date of the patient's prior transplant, whichever is the first to occur. If the patient has not returned to active status during this one-year period, then the listing center, or centers if the patient is multiple listed, shall immediately remove that patient from all liver waiting lists and shall notify UNOS within 24 hours of the event. If the living donor recipient is again added to a liver waiting list, waiting time shall begin as of the date and time the patient is relisted. "

Currently, these candidates are not being removed from the list by UNetSM, and centers may not be aware that this is occurring. This was intended to allow patients to regain their waiting time if a deceased donor transplant became necessary, in an era when waiting time was an important factor in liver allocation. The Committee felt that this programming practice should not continue to occur.

***** RESOLVED, that UNetSM should no longer automatically relist patients removed from the liver waiting list for living donor transplantation. This will be implemented upon completion of programming in the UNOS System.**

Committee Vote: Vote: 14 in favor, 0 opposed, 0 abstentions

13. **Request to Allow MELD/PELD Score Increases at 3 Months for Exceptions.** A request came to the Liver Committee from the Region 1 Liver Regional Review Board, which had agreed that patients with FAP, oxalosis, PLD and HPS are eligible to receive increased MELD/PELD scores upon RRB review. These patients are also eligible to receive increases in their exception scores at 3-month intervals. However, due to the specific wording of Policy 3.6.4.5 (Liver Candidates with Exceptional Cases), the UNetSM application does not allow increases in exception scores upon extension, and centers were required to submit a new application every three months in order to allow for the increased score. This caused confusion in the review of such extensions, which appeared to be initial cases. The Region asked that UNetSM be programmed to allow increases in MELD/PELD scores for exceptional cases. The Committee determined that this would be an appropriate modification to the system as a whole, and approved the following resolution for consideration by the Board of Directors:

*** **RESOLVED, that Policy 3.6.4.5 (Liver Candidates with Exceptional Cases) shall be amended as follows and implemented upon completion of programming in the UNOS System.**

3.6.4.5 **Liver Candidates with Exceptional Cases.** Special cases require prospective review by the Regional Review Board. The center will request a specific MELD/PELD score and shall submit a supporting narrative. The Regional Review Board will accept or reject the center's requested MELD/PELD score based on guidelines developed by each RRB. Each RRB must set an acceptable time for Reviews to be completed, within twenty-one days after application; if approval is not given within twenty-one days, the patient's transplant physician may list the patient at the higher MELD or PELD score, subject to automatic referral to the Liver and Intestinal Organ Transplantation and Membership and Professional Standards Committees. Exceptions to MELD/PELD score must be reapplied every three months; otherwise the patient's score will revert back to the patient's current calculated MELD/PELD score. If the RRB does not recertify the MELD/PELD score exception, then the patient will be assigned a MELD/PELD score based on current laboratory values. Centers may apply for a MELD/PELD score equivalent to a 10% increase in candidate mortality every 3 months as long as the patient meets the original criteria. Extensions shall undergo prospective review by the RRB. A patient's approved score will be maintained if the center enters the extension application more than 3 days prior to the due date and the RRB does not act prior to that date (i.e., the patient will not be downgraded if the RRB does not act in a timely manner). If the extension application is subsequently denied then the patient will be assigned the laboratory MELD score.

Committee Vote: 22 in favor, 2 opposed, 3 abstentions

The Committee was provided a programming specification document for this proposal during the May 2004 meeting.

14. Discussion of OPTN Policy Development, Final Rule, and OPTN Long Range Planning. During the February 2004 meeting, the Committee reviewed a report of the long range planning meeting that was attended by the Executive Committee and all Committee chairs in October 2003. In November 2003, the Board approved a motion stating that "when making policy recommendations to the Board of Directors regarding organ allocation, committees shall include recommendations specifically addressing the performance goals set forth in the OPTN Final Rule, including performance indicators to measure the achievement of performance goals and transplant center performance," and that, in doing so "Committees shall take into consideration the deliberations of the strategic planning process of the OPTN." It was felt that the Liver Committee has been doing this in its policy development, but perhaps not as formally structured as described in the resolution and outlined in the long-range planning report. The MELD/PELD policy was intended to direct organs to more urgent patients and thus reduce waiting list deaths; this parameter, along with others, such as the impact on post-transplant survival, has been evaluated every six months since policy implementation. A Subcommittee was selected and charged to determine further parameters for policy evaluation and more formalized language to be used as guidance to the Committee when evaluating policy modifications.

During the May 2004 meeting, Richard Freeman, MD, presented a draft of the draft policy goals developed by the Subcommittee that could be used to assess policies in accordance with the resolution from the Board and the strategic planning process of the OPTN (**Exhibit M**). The major goal for the policy development was that patient-specific variables should be used to stratify patients based in their net benefit of transplantation. Proposed changes included deletion of a paragraph describing how the current policy meets the stated goals, addition of the word "Intestine" where appropriate, and addition of language related to efficient placement of organs and enhanced utilization of extended –criteria donors. The Committee submits the following for consideration by the Board of Directors

*** **RESOLVED, that the Board of Directors hereby supports the goals for liver and intestinal organ allocation policy development as set forth in Exhibit M.**

Committee Vote: 16 in favor, 0 opposed, 0 abstentions.

III. Other Issues: Other Significant Items

15. Proposed Guidelines for Living Liver Donor Evaluation and Proposed Guidelines for Living Kidney Donor Evaluation. The Committee reviewed the proposed guidelines for Living Donor Evaluation circulated for public comment by the Ad Hoc Living Donor Committee. The guidelines were based on those used in New York State, although the proposed guidelines were not as stringent with regard to recipient selection. Committee members felt that the living donor recipient should meet the minimum listing criteria for deceased donor candidates (i.e., a MELD of 10) and should qualify as a candidate for deceased donor transplant at that center. The Committee viewed the guidelines as a starting point, and approved the following motion:

Motion: The Committee accepts the Living Liver Donor Evaluation Guidelines, with the provision that the living donor candidate should meet the minimal listing criteria for deceased donor recipients (MELD score of 10 or higher) and qualify as a candidate for deceased donor transplantation at the transplant center

Committee Vote: 15 in favor, 0 opposed, 0 abstention.

16. Request from the Ad Hoc Living Donor Committee Regarding Potential Conflict of Interest in Living Organ Donor and Recipient Surgeries. The Ad Hoc Living Donor Committee approved the following motion and asked that that the organ-specific and relevant constituent Committees review this recommendation and comment upon what would constitute “best practice” regarding this issue:

RESOLVED, that it is desirable that, whenever possible, the donor and recipient surgeries be performed by different surgeons having primary responsibility for either the donor or recipient. It is recognized that in some circumstances (e.g., fulminant patients) this may not always be practical.

The intent of the motion was to discourage the potential conflict of interest that arises when the donor and recipient transplant procedures are performed by the same surgeon. The Liver Committee agreed with the principle that the donor and recipient surgeries should be performed by different surgeons if possible. Committee members discussed whether this would be difficult in smaller centers. The resolution is consistent with the criteria for living donor programs that were reviewed and endorsed by the Liver Committee and approved by the Board, which requires that two liver surgeons be on site. The Committee supported the resolution by unanimous vote.

17. Subcommittee for Exploration of National Review Board (NRB) Process. Jeffrey Punch, MD, Subcommittee Chair, reviewed the potential advantages of creating a national review board, including greater uniformity in case review across regions, noting that regional boards may foster trust, in that centers know those responsible for the reviews, and allow for meaningful regional differences in the MELD/PELD scores needed for transplant. One early proposal for an NRB, which included paid reviewers, was considered infeasible due to cost and insurance issues, as retired reviewers may not be familiar with the current state of transplantation, and use of such reviewers would not constitute peer review.

The current RRB caseload was discussed. The number of adult exceptional case reviews during the first 18 months of the MELD system was 3,281; however, over two-thirds of these were HCC cases, which are no longer reviewed. If specific criteria were developed for diagnoses such as familial amyloidosis and primary oxaluria and a form could be developed to capture the necessary information, then these reviews could potentially be eliminated as well. It was estimated that this would leave 700 adult reviews per year. At this point in time, the Subcommittee asked for direction from the full Committee. The Subcommittee was asked to provide standard definitions for diagnoses such as cholangiocarcinoma, familial amyloidosis, primary oxaluria etc., as well as recommendations for the structure and implementation of an NRB. The Committee voted unanimously that the Subcommittee should continue its work.

During the May 2004 meeting, Dr. Punch presented a draft proposal for a national review board (NRB) to the Committee (**Exhibit N**). The Subcommittee was able to reach agreement on the composition of the Board and voting procedures. The Board would consist of 3-4 representatives per region. Representatives would be active transplant physicians or surgeons and would not be allowed to appoint an alternate or abstain from voting. Cases would be randomly submitted to a subset of the Board. For pediatric cases, a majority of the Board would be pediatric practitioners. Regarding the assignment of MELD/PELD score, two differing principles had emerged: one

that would give the same MELD/PELD score for a specific diagnosis across the country (Option A), and another that would attempt to assign the same probability of transplant across the country (Option B). The latter proposal would entail assignment of MELD/PELD scores that would be adjusted to the mean/median MELD/PELD score for the local distribution unit. The MELD/PELD data for the local area would be provided to the NRB. The first option would potentially resolve the observed disparities in the MELD/PELD scores at transplant around the country over time. It would also be consistent with the way HCC patients are currently treated. The second option takes these differences into account, and attempts to ensure that patients are treated equally given these disparities. This is similar to what is being practiced in many Regions. A perceived problem with option B was termed “MELD creep,” meaning that the MELD/PELD score may increase over time in response to requests for higher scores; however, this phenomenon could be constrained by the NRB. The probability of transplant by MELD/PELD score by OPO would perhaps be a useful piece of information for the NRB for option B. It was noted that the exception process is meant to provide candidates with unusual conditions equal access to transplantation before they become untransplantable.

An informal poll of the Committee indicated that a majority of the Committee is in favor of an NRB. A second poll revealed that the Committee would prefer option B if an NRB was instituted. Some members felt that their RRBs were functioning well and an NRB might not be needed. Others felt that an NRB would provide better uniformity in terms of review across the country. Committee members noted that there may be a range of values that could be assigned for specific diagnoses that would represent a compromise between options A and B. The Subcommittee was charged with presenting a formal proposal to the Committee during the July meeting, for circulation for public comment in August 2004. This would include standardized criteria for specific diagnoses.

18. OPTN/SRTR Data Working Group Proposal for Additional Transplant Endpoints. Lawrence Hunsicker, MD, presented a proposal for Evaluation of Multiple Transplant Outcomes on behalf of the Data Working Group (DWG) (**Exhibit O**). Analysis of transplant outcomes has typically focused on time to death and time to graft loss. Dr. Hunsicker noted that, while these are important outcomes, with improving patient and graft survival they are no longer the only relevant outcomes to consider, and that the Secretary’s Advisory Committee on Transplantation (ACOT) has recommended that the OPTN begin to collect and analyze information on the impact of transplantation on “quality of life.” He noted several limitations of the exclusive focus on death and graft failure. Alternative outcomes such as morbidity and functional status may be highly correlated with mortality risk. Proposed additional dimensions of transplant outcomes identified by the DWG included:

1. Mortality
2. Cumulative Morbidity:
3. Functional Status
4. Psychological Distress:
5. Resource Use

Data should be collected pre- and post-transplant in order to determine transplant benefit. The OPTN collects limited data related to mortality, morbidity, and functional status. External sources, such as the SSDMF and State Medicaid databases can be used to supplement OPTN data. The DWG has asked that Karnofsky score be collected to determine functional status, which would provide more detail than the four categories currently collected. The DWG is also purposing a pilot study for collecting SF-36 data from waiting list candidates and transplant recipients. The intent is for the data to be used by the organ-specific Committees in the development of allocation policy. These recommendations will be submitted to the Board of Directors.

19. Memorandum from UNOS Policy Compliance Department Regarding Rounding of Laboratory Values Used to Calculate MELD/PELD Scores. The UNOS Policy Compliance Department reported instances of centers rounding the laboratory values used to calculate the MELD and PELD scores (for example, a creatinine of 1.6 being rounded to 2). UNetSM allows the data to be entered to 1 decimal place, so that rounding to the first decimal place is allowed. The Committee agreed that instances of rounding to the nearest whole integer should be considered policy violations.

20. Proposed Changed to the HCC Extension Form Validation Procedure. The Committee was asked to clarify an aspect of the UNetSM programming relating to Policy 3.6.4.4 (Liver Transplant Candidates with Hepatocellular Carcinoma (HCC)). UNOS staff had encountered the following situation: A patient had received ablative therapy between the initial HCC application and the first extension. The exception form in UNetSM requested the ablative

therapy date at the time of the application and the first extension, which is in accordance with the policy. However, the system again requested the ablative therapy date after the second extension as well, and the application was not approved because the date was considered out of range. This validation check does not reflect the intent of the policy, and the Committee agreed that the validation for the ablative therapy date should be changed to “on or after the date of the most recent HCC application that reported a larger number of tumors.” This was approved by unanimous vote.

21. Memorandum from the UNOS Policy Compliance Department Regarding Phone Calls for MELD/PELD Recertification. At the time the MELD/PELD system was implemented, the Committee asked that the Policy Compliance Department make telephone calls to centers with candidates whose MELD/PELD score is 19 or higher and who are nearing their recertification due date. This requires approximately 531 telephone calls per month. The Committee reviewed a memorandum from the Policy Compliance Department asking that calls be made to patients with scores of 22 or higher; this would reduce the workload to approximately 234 calls per month. The current mean MELD/PELD score at time of transplant is 20.6 for standard cases and 28.6 for exceptional cases. All centers are provided with a list of candidates nearing the recertification deadline each time UNetSM is accessed. The Committee approved this recommendation unanimously.
22. Recommendation From the Ad Hoc Operations Committee That Each Organ Specific Committee Review Required Listing Criteria And Develop Methods To Assure More Accurate Patient Listing And Donor Acceptance Criteria. The Operations Committee had requested that the Liver Committee review the required criteria for patient listing to determine whether those criteria should be revised or made more stringent. The Liver Committee requested an analysis of the required variables; this was provided to the Committee. In summary, the use of the criteria, such as maximum distance and donor weight and age, seemed to vary across center, and often the widest range seemed to be used. The use of ranges that are outside the bounds of what a center might actually accept can lead to unnecessary offers, increasing placement time. An analysis provided by the SRTR showed that wider ranges correlated with a higher rate of offers accepted. This issue was remanded to a Subcommittee, who will review the data and make recommendations to the Committee.
23. Aggressive or Expedited Organ Placement. During the February 2004 meeting, the Committee discussed the MPSC’s recommendations regarding aggressive organ placement, as reported to the Board in November 2003. The Subcommittee on Aggressive Placement, which had provided input in this process, will review the MPSC recommendations. The Subcommittee reviewed the recommendations and found them to be appropriate.
24. Memorandum from the OPO Committee regarding Reuse of Disposable Organ Packaging. The OPO Committee asked that the Liver Committee review and comment on three proposed recommendations related the reuse of disposable organ containers and the standardization of packaging. The Liver Committee voted unanimously that the recommendations of the OPO Committee would apply to the transportation of livers.
25. Memorandum from the Organ Availability Committee (OAC) Regarding “Predicting Patient Survival in the Kidney Transplant Assessment Clinic. A Practical Clinical Application.” The Liver Committee was asked to review an abstract that outlined a model to predict individual survival under different treatment assumptions, based on a patient’s socioeconomic and comorbidity data; it was reported that this model is used in the United Kingdom. The organ-specific Committees were asked to discuss the applicability of this model to their organ system. The Liver Committee reviewed the document during the February 2004 meeting, but did not feel that this model was applicable to liver transplantation.
26. Letter from Member Regarding Liver Placement Procedures. The Committee reviewed a letter from a member who expressed concerns about the liver placement procedures in his local area (**Exhibit P**). At issue were instances when a center accepted an offer only to turn it down much later, risking organ wastage. The representative from the OPO involved addressed the Committee with this issue, and asked the Committee for guidance. He noted 31 cases over an 18-month period, and it was reported that some of the organs were not placed. This issue could not be resolved at the local level. The Committee felt that this was the purview of the MPSC, but opined that it would be appropriate to comment on the practice, and approved the following by a vote 19 in favor, 0 opposed, and 0 abstentions.

Motion: The Liver Committee does not approve of the practice described above. The center will be forwarded to the MPSC for investigation and possible action.

27. Regional Review Board Case Referrals: Exceptional Case Requests With No Majority Vote in 21 Days (Patients Transplanted at Unapproved Score). In accordance with Policy 3.6.4.5 (Liver Candidates with Exceptional Cases), the Committee reviewed fourteen MELD/PELD exceptional cases that were not approved the RRB within 21 but the candidates were transplanted at the requested score.

Regional Review Board Case Referrals Considered in February 2004

- Case 4528, Region 1. This 42-year old man received a transplant on June 11, 2003 for decompensated HCV. On August 20, 2003, the patient was determined to have hepatic artery thrombosis. The patient's calculated MELD score was 8 and center petitioned for a MELD of 30; this was denied. The center reapplied for a score of 30 when the patient's calculated score was a 22. Three centers approved the appeal, two did not approve it, and two centers did not vote. The center accepted the score of 30 at the 21-day point, and the patient was transplanted at that score on September 14, 2003. The Committee members felt that the patient's calculated score of 22 accurately reflected the risk of death, and that the score of 30 was not justified.

Motion: The Committee supports the decision of the RRB in case 4528; a letter will be sent to the center notifying it of the Committee's decision.

Committee Vote: 15 in favor, 4 opposed, 0 abstentions

- Case 4610, Region 2. This case involved a 61-year-old male with Stage T1 HCC; the center requested a MELD score of 20. The center did not indicate that a bone scan had been done and the application was sent out for prospective review. At that point in time the Committee had decided that a bone scan was not necessary but the policy had not been formally changed. The case went beyond 21 days without resolution and the patient was transplanted at the requested score. The Committee voted that a letter be sent to the center indicating that they should have followed the policy in place at that time.

Motion: The Committee supports the decision of the RRB in case 4610; a letter will be sent to the center notifying it of the Committee's decision.

Committee Vote: 16 in favor, 3 opposed, 0 abstentions

- Case 4851, Region 3. The case involved a 37-year-old female with sclerosing cholangitis and ulcerative colitis and a calculated MELD of 14. The center requested a MELD of 24. The RRB vote was tied with 5 in favor and 5 opposed. Those opposed indicated that more information was necessary. The case went beyond 21 days without resolution and the patient was transplanted at the requested score. The Committee agreed with the RRB that the center should have provided more information, and that there was inadequate documentation to support the request.

Motion: The Committee supports the decision of the RRB in case 4851; a letter will be sent to the center stating that the center provided inadequate documentation to support the request.

Committee Vote: unanimous.

- Case 4989, Region 7. The center requested a PELD score of 30 for a 12-year-old male with cystic fibrosis and biliary cirrhosis and a calculated PELD score of [-2]. The RRB vote was tied with 2 in favor, 2 opposed, and 2 abstentions. Those opposed did not agree that the risk of death was high enough to receive a PELD of 30. The case went beyond 21 days without resolution and the patient was transplanted at the requested score. There was agreement that the center should have appealed with a lower PELD score.

Motion: The Committee supports the decision of the RRB in case 4989; a letter will be sent to the center stating that the request was inappropriate.

Committee Vote: unanimous.

- Case 5018, Region 7. The case involved a 49-year-old female with severe refractory encephalopathy due to hepatitis C and a calculated MELD score of 13. The center requested a score of 24. The RRB vote was tied with 2 in favor and 2 opposed. Those opposed stated that encephalopathy was not an adequate reason for a MELD upgrade. The case went beyond 21 days without resolution and the patient was transplanted at the requested score. The Committee upheld the decision of the RRB

Motion: The Committee supports the decision of the RRB in case 5018; a letter will be sent to the center stating that the request was inappropriate.

Committee Vote: 14 in favor, 3 opposed, 0 abstentions.

- Case 5044, Region 8. This case involved the denial of an appeal for a patient with complications of a failed shunt, stage 4 encephalopathy, and an ongoing GI bleed. The information included in the original application was not available. The center requested a MELD of 29, and the patient's calculated score was 17. The RRB vote was 1 in favor and 1 opposed, with 2 centers not voting. The Committee felt that the request was reasonable given the available information, and that the center had utilized the appeal process. No action was taken.
- Case 4691, Region 9. The case involved a second appeal for a patient with a hepatoma, refractory ascites, and inability to place a transjugular intrahepatic portosystemic shunt, or "TIPSS". The center requested a MELD of 29 because the RRB had determined that patients with inability to place or failure of a TIP would be eligible for a 29. The RRB vote was 2 in favor and 1 opposed. The case went beyond 21 days without resolution and the patient was transplanted at the requested score. One reviewer stated that the patient did not meet the Region 9 criteria, which specified failed TIPSS, not an inability to place a TIPSS. The Committee opined that it seemed unreasonable to ask for a MELD of 29 given the information provided.

Motion: The Committee supports the decision of the RRB in case 4691; a letter will be sent to the center stating that the request was inappropriate.

Committee Vote: unanimous.

- Case 4654, Region 9. The case involved a 5-year-old child with recurrent hemolytic uremic syndrome who had received a kidney transplant but was waiting for a combined liver-kidney. The center requested a PELD of 46, which equates to a 3-month mortality of 50%; the patient's calculated score was [-8]. The RRB vote was 1 in favor, 2 opposed, with those in opposition citing the high score requested. The case went beyond 21 days without resolution and the patient was transplanted at the requested score. The Committee noted that children needing multiorgan transplants often need higher scores to receive a size-matched donor, and voted to take no action.
- Case 4467, Region 9. The center requested a MELD of 35 for a patient with familial amyloidosis who had undergone a heart transplant with a calculated MELD of 7. The patient had been upgraded to a MELD of 28 but had not received an organ in over 12 months. The RRB vote was 1 appropriate, 2 not appropriate. The case went beyond 21 days without resolution and the patient was transplanted at the requested score. The center had cited that the heart graft was at risk due to amyloid deposition as a justification for the higher score. The Committee felt that there was insufficient data provided to assess this.

Motion: The Committee supports the decision of the RRB in case 4467; a letter will be sent to the center stating that the center provided inadequate documentation to support the request.

- Case 5121, Region 9. The case involved a patient with advanced PBC, extensive portal vein thrombosis, intractable ascites, who could not have a TIPSS placed. The calculated MELD score was 18 and the center requested a score of 29. The RRB vote was 2 in favor and 1 opposed, with one center not voting. The case did not reach a majority vote within 21 days and the patient was transplanted at the requested score. The Committee felt that the requested score was too high given the information provided, and that the center could

have appealed or reapplied. The Committee also discussed the fact that the Region 9 RRB was not responsive. No action was taken.

- Case 4357, Region 1. This case involved a 61-year-old female with polycystic liver and kidney disease complicated by renal progressive failure and dialysis and muscle wasting. Her calculated MELD score was 20. She had been listed at a MELD score of 24 per Region 1's agreement that patients with polycystic disease would receive a MELD of 24. The patient had waited 6 months and the center was requesting a MELD score of 26, which was also consistent with an agreement made by the region. The RRB vote was 3 in favor, with six centers not voting. The case went beyond 21 days without resolution and the patient was transplanted at a MELD of 28. The Committee did not disagree with the center's listing of this patient, as it was in accordance with the regional agreement, and no further action was taken.
- Case 4163, Region 7. The center requested a MELD score of 24 for a 53-year-old male with metastatic carcinoid tumor to the liver and a calculated MELD of 18. The RRB vote was tied a 2 in favor and 2 opposed, one stating that the requested score was too high, and the other stating that the data for transplanting patients with carcinoid is inconclusive. The case went beyond 21 days without resolution and the patient was transplanted at a MELD of 24. The Committee agreed with the reviewers' comments.

Motion: The Committee supports the decision of the RRB in case 4163; a letter will be sent to the center stating that the request was inappropriate.

Committee Vote: 15 in favor, 1 opposed, 1 abstention.

- Case 4406, Region 9. The case involved a patient with hepatopulmonary syndrome whose center requested a MELD of 29. The RRB vote was 2 in favor and 1 opposed. One center did not vote, and the case did not reach a majority vote within 21 days. The Committee felt that the patient met the criteria for hepatopulmonary syndrome, and that the fault was in the RRB's lack of response. No action was taken.
- Case 4173, Region 11. The center requested a MELD of 24 for a 53-year-old male with cirrhosis secondary to hepatitis C and a calculated MELD of 18. The RRB vote was tied at 4 in favor and 4 opposed. The case went beyond 21 days without resolution and the patient was transplanted at the requested score. The Committee felt that that the center's request was appropriate and voted to take no further action.

Regional Review Board Case Referrals: Referrals for Status 1, May 2004

- Center 1721, Region 7. The case involved a 12 year-old patient with cystic fibrosis and chronic rejection post liver transplantation. The patient was first listed as an exceptional Status 1 in November 2003. After eight approved extensions, the center requested extensions on January 29, 2004 and February 5, 2004. Both were deemed inappropriate by the RRB by votes of 4 not appropriate, 3 appropriate, and 4 not appropriate, 2 appropriate. The RRB found the listing inappropriate upon written appeal and conference call. The candidate was transplanted as a Status 1 on February 7, 2004. The center was informed of the initial vote on February 5, 2004. It was reported that numerous livers were turned down for this child. Reviewers felt that a PELD score would be more appropriate given the circumstances, and others noted the length of time the patient had been listed in Status 1. The Liver Committee agreed with the decision of the RRB. As the center had no prior referrals, no action will be taken other than a letter indicating the Committee's decision.

Motion: The Committee upholds the decision of the RRB in the case of Center 1721. A letter will be sent to the center stating that the request was inappropriate.

Committee Vote: 14 in favor, 0 opposed, 0 abstentions,

- Center 1546, Region 5. The case involved a 14-month-old child with Maple Syrup Urine Disease (MSUD). The patient was listed as a Status 1 on November 5, 2003, and transplanted on November 9, 2003. The RRB found the listing inappropriate upon initial request, written appeal, and a conference call appeal. The reviewers

commented that the patient did not meet Status 1 criteria and should be listed with a PELD score. The Committee upheld the RRB's decisions.

Motion: that the Committee upholds the decision of the RRB in the case of center 1546 and a letter should be sent to the center recommending that a request for a PELD would have been more appropriate. PELD score.

Committee Vote: 14 in favor, 0 opposed, 0 abstentions.

- Center 1550, Region 5. The case involved an 18-year old patient who had received a transplant prior to becoming 18 who developed severe acute rejection at 14 months post transplant. The patient was believed to have developed autoimmune hepatitis and had developed an ongoing GI bleed. The RRB found the listing inappropriate upon initial request as well as upon written and conference call appeals. The patient was transplanted prior to the center learning of the RRB's decision. The Region 5 representative noted that one complicating issue in this case was regarding pediatric patients transitioning to adulthood during the course of their disease. The regional representative also noted the lag time in the RRB response, and indicated that the center did not appear to act with improper intent. The Committee agreed that no action should be taken

Motion: No action will be taken in this case.

Committee Vote: 13 in favor, 1 opposed, 0 abstentions.

- Center 1343, Region 7. The case involved a 71-year old with elevated bilirubin post-liver transplant. The request for Status 1 was made on February 16, 2004, and the patient was transplanted as a Status 1 on February 18, 2004. The RRB found the initial request inappropriate by a vote of 6 not appropriate/5 appropriate. The written appeal was denied by a vote of 7 to 5. The reviewers commented that the patient did not meet the criteria for PNF and should be listed with a MELD score. The center received the RRB response after the patient was transplanted. The Committee felt that the center provided inadequate information. It seemed likely that the patient had PNF, but this was not discernable from the information provided on the application.

Motion: Center 1343 should receive a letter stating that the information provided was inadequate, and that a clinical narrative should be provided in all cases.

Committee Vote: 13 in favor, 0 opposed, 0 abstentions.

- Center 1264, Region 9. The case involved a 6-year old listed with HCC, HAT, and biliary sepsis. The initial request was found to be inappropriate by the RRB, and the written appeal received a tie vote. The conference call appeal was denied unanimously by the RRB. The patient was transplanted prior to learning of the initial RRB decision. The patient had been listed with a PELD of 40 for several months without any offers. The Committee agreed that the listing was not appropriate, and asked that a letter be sent to center.

Motion: Center 1264 should receive a letter stating that the Committee found the listing to be inappropriate.

Committee Vote: 12 in favor, 1 opposed, 0 abstentions.

Regional Review Board Case Referrals: Exceptional Case Requests With No Majority Vote in 21 Days (Patients Transplanted at Unapproved Score, May 2004)

- Case 5044, Region 9. The case involves an appeal for a patient with cryptogenic cirrhosis and a calculated MELD score of 17, for whom the center requested a score of 29. A surgical shunt had been found to be ineffective, and the center suggested that this should be considered in the same manner as a failed TIPSS. The appeal did not reach majority vote within 21 days and the patient was transplanted at the higher score. The regional representative recommended that no action be taken.

Motion: No action will be taken in this case.

Committee Vote: 13 in favor, 0 opposed, 0 abstentions

- Case 4691 Region 9: This case involved an appeal for a patient with refractory ascites and inability to place a TIPSS. The members in Region 9 had agreed that, if a TIPSS is placed and functioning and the patient continues to have massive ascites or uncontrollable variceal hemorrhage, the center may petition for a higher score. The appeal did not reach majority vote within 21 days and the patient was transplanted at the requested score. Reviewers noted that the patient did not meet the criteria, as a TIPSS had not been placed. The center has had prior referrals to the Liver Committee. This center also had two other referrals during the May 2004 meeting for the same reason (5309 and 5121). The Committee recommended that these cases be sent to the MPSC.

Motion: Cases 4691, 5309, and 5121 will be forwarded to the MPSC.

Committee Vote: 13 in favor, 0 opposed, 0 abstentions.

- Case 4654, Region 9. The case involved a request for a PELD score of 46 for a 5-year old patient with Factor H deficiency. The patient had received a kidney transplant and was in renal failure, awaiting a combined liver-kidney transplant. The PELD score of 46 equates to a predicted 3-month mortality of 50%, which would allow the patient to go ahead of an adult for a pediatric donor. Reviewers indicated that the PELD requested was too high. The case did not reach majority vote within 21 days and the patient was transplanted at the requested score. The Committee felt that this request was not inappropriate and took no action on this case. This center had prior referrals, including cases 4691, 5309, and 5121.
- Case 4467, Region 9. This case involved a request for a PELD score of 35 for a patient with familial amyloidosis and a calculated PELD score of 7. The patient was currently listed at a PELD of 28 by exception but had not received any offers in 12 months. The appeal did not reach majority vote within 21 days and the patient was transplanted at the requested score. The center had no prior referrals. Reviewers stated that the requested score was too high. Committee members noted that the review Board did not act in a timely manner. The recommendation was that no action be taken.

Motion: No action will be taken on this case.

Committee vote: 12 in favor, 0 opposed, 0 abstentions.

The vice-chair authorized a Subcommittee to review the remaining cases.

OPTN/UNOS Liver and Intestinal Organ Transplantation Committee
February 5, 2004
Chicago, Illinois

Committee Members in Attendance

C. Wright Pinson, M.D.	Chairman
John R. Lake, M.D.	Vice Chairman
Elizabeth A. Pomfret, M.D.	Regional Rep. Reg. 1
Luis Arrazola, M.D.	Regional Rep. Reg. 2
James D. Eason, M.D.	Regional Rep. Reg. 3
W. Kenneth Washburn, M.D.	Regional Rep. Reg. 4
Steven D. Colquhoun, M.D. (via telephone)	Regional Rep. Reg. 5
James D. Perkins, M.D.	Regional Rep. Reg. 6
Steven L. Flamm, M.D.	Regional Rep. Reg. 7
Michael F. Sorrell, M.D. (via telephone)	Regional Rep. Reg. 8
Glyn R. Morgan, M.D.	Regional Rep. Reg. 9
Jeffrey D. Punch, M.D.	Regional Rep. Reg. 10
J. Kelly Wright, Jr., M.D.	Regional Rep. Reg. 11
Susan M. Dunn, R.N., BSN	At Large
Robert G. Gish, M.D.	At Large
Simon Horslen, M.D. (via telephone)	At Large
Kim Kottemann	At Large
Marlon F. Levy, M.D.	At Large
Rob J. Linderer, R.N., BSN	At Large
Sue V. McDiarmid	At Large
David C. Mulligan, M.D.	At Large
Adrian Reuben, M.D.	At Large
Jorge D. Reyes, M.D.	At Large
Lynn Pearson, R.N.	At Large
Meg M. Rogers	At Large
Melissa L. Zimmerman, R.N.	At Large
Richard B. Freeman, M.D.	Ex. Officio

Committee Members Unable to Attend

Michael R. Lucey, M.D.	At Large
Debbie Vega	At Large

DOT Staff In Attendance

Hui-Hsing Wong M.D., J.D.	Ex Officio - Government Liaison
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SRTR Staff in Attendance

Nathan Goodrich
Robert Merion, M.D.

UNOS Staff in Attendance

Mary D. Ellison, Ph.D., MSHA	
Doug A. Heiney	Director, Membership and Professional Services
Ann M. Harper	Policy Analyst
Rob McTier	Senior Systems Analyst
William Lawrence, Esq.	Director, Patient Affairs
Deanna Sampson, J.D.	Director, Policy Compliance

Guests in Attendance

Tim Brown	Donor Network of Arizona
R. Mark Ghobrial, MD, PhD	UCLA Medical Center
Ryutaro Hirose, MD	Univ of CA San Francisco Med Ctr

John P. McVicar, MD
Tom Mone
Jill Stinebring, RN
Russell Wiesner, M.D.

UC Davis Medical Center
OneLegacy, Los Angeles
Lifesharing Community Organ Donation, San Diego
UNOS President

OPTN/UNOS Liver and Intestinal Organ Transplantation Committee
May 20, 2004
Boston, MA

Committee Members in Attendance

John R. Lake, M.D.	Vice Chairman
Elizabeth A. Pomfret, M.D.	Regional Rep. Reg. 1
Luis Arrazola, M.D.	Regional Rep. Reg. 2
James D. Eason, M.D.	Regional Rep. Reg. 3
W. Kenneth Washburn, M.D.	Regional Rep. Reg. 4
Steven D. Colquhoun, M.D.	Regional Rep. Reg. 5
James D. Perkins, M.D.	Regional Rep. Reg. 6
Glyn R. Morgan, M.D.	Regional Rep. Reg. 9
Jeffrey D. Punch, M.D.	Regional Rep. Reg. 10
J. Kelly Wright, Jr., M.D.	Regional Rep. Reg. 11
Robert G. Gish, M.D.	At Large
Simon Horslen, M.D.	At Large
Kim Kottemann	At Large
Marlon F. Levy, M.D.	At Large
Rob J. Linderer, R.N., BSN	At Large
Michael R. Lucey, M.D.	At Large
Sue V. McDiarmid	At Large
David C. Mulligan, M.D.	At Large
Adrian Reuben, M.D.	At Large
Jorge D. Reyes, M.D. . (via telephone)	At Large
Lynn Pearson, R.N.	At Large
Meg M. Rogers	At Large
Melissa L. Zinnerman, R.N.	At Large
Richard B. Freeman, M.D.	Ex. Officio

Committee Members Unable to Attend

C. Wright Pinson, M.D.	Chairman
Steven L. Flamm, M.D.	Regional Rep. Reg. 7
Michael F. Sorrell, M.D.	Regional Rep. Reg. 8
Susan M. Dunn, R.N., BSN	At Large

DOT Staff In Attendance

Hui-Hsing Wong M.D., J.D.	Ex Officio - Government Liaison
Michael Dries, Pharm.D.	Ex Officio - Government Liaison
Henry Krakauer, MD	HRSA/OASPE

SRTR Staff in Attendance

Nathan Goodrich	SRTR
Robert Merion, M.D.	SRTR

UNOS Staff in Attendance

Mary D. Ellison, Ph.D., MSHA	Asst. Exec. Director if Federal Affairs, UNOS
Doug A. Heiney	Director, Membership and Professional Services
Erick Edwards, PhD.	Asst. Director, UNOS Research Dept.
Ann M. Harper	Policy Analyst, Committee Liaison
Rob McTier	Senior Systems Analyst
Deanna Sampson, J.D.	Director, Policy Compliance
Walter Graham, Esq.	UNOS Executive Director

Guests in Attendance

Russell Wiesner, M.D.	UNOS President
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Dean Kappel
Will Chapman, MD

CEO, Mid-America Transplant Services
Washington Univ., St. Louis, MO

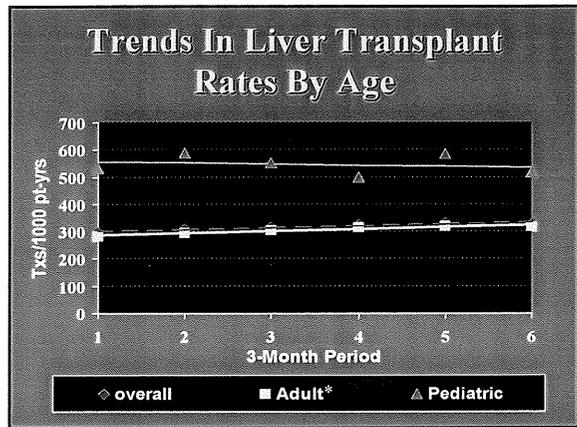
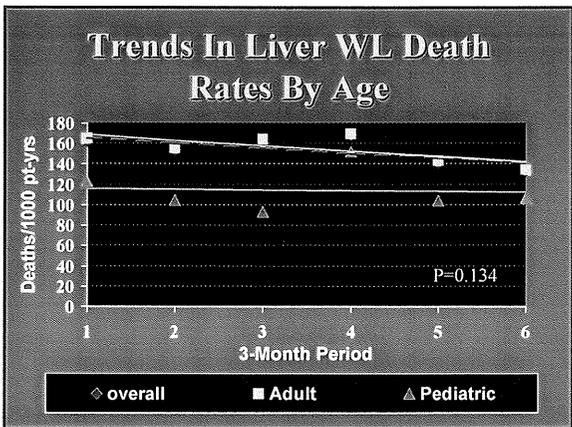
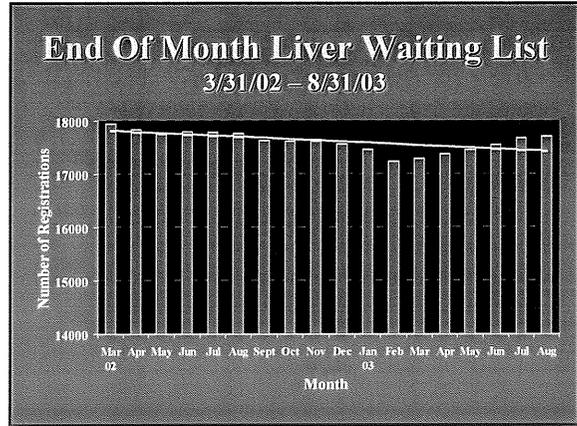
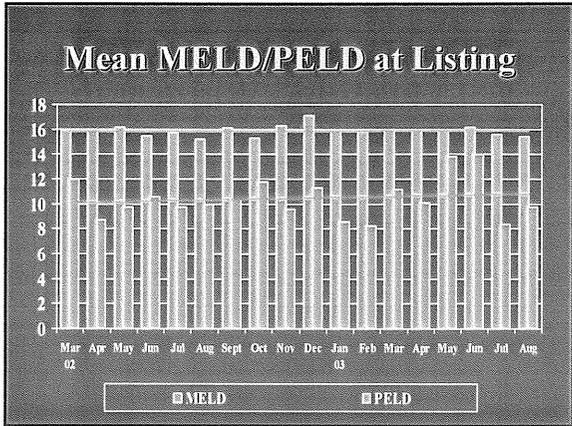
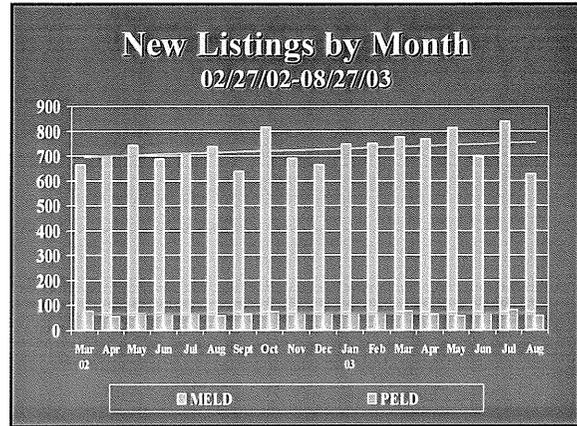
Evolving Concepts in Liver Allocation in the MELD/PELD Era

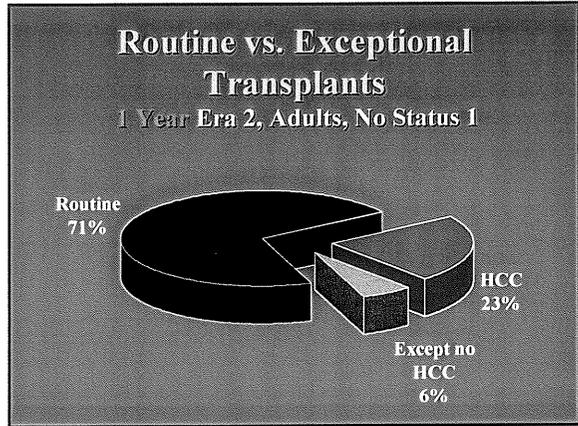
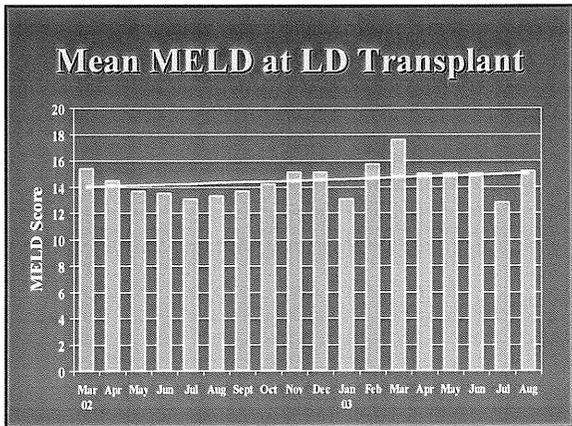
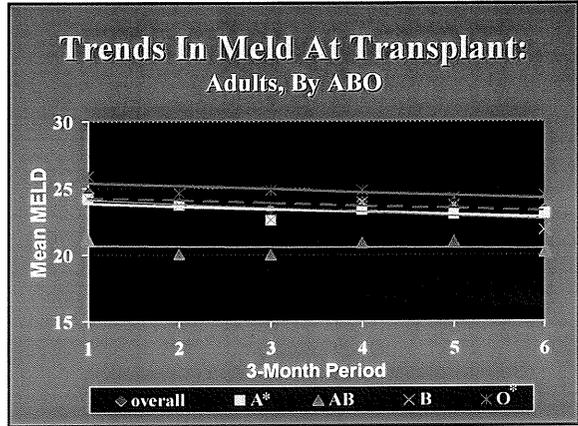
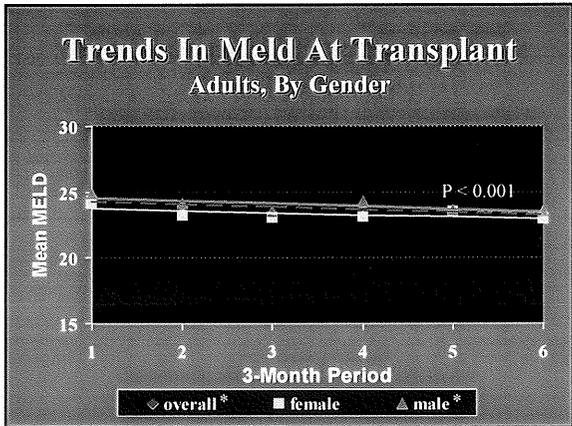
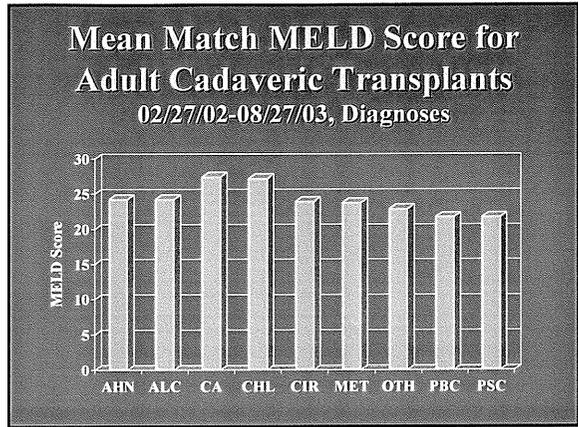
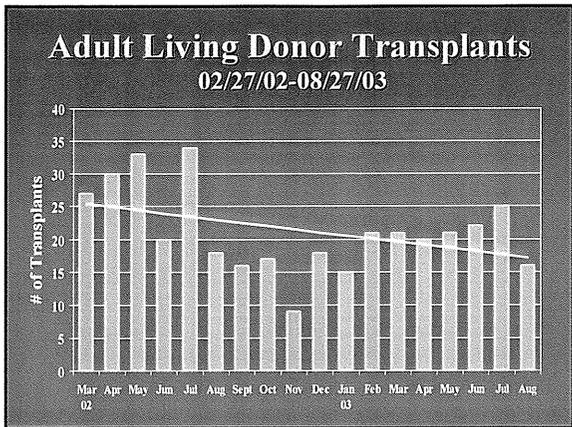
December 9, 2003
Washington, DC

Richard B. Freeman, MD







Waiting List Outcomes for HCC Exceptions

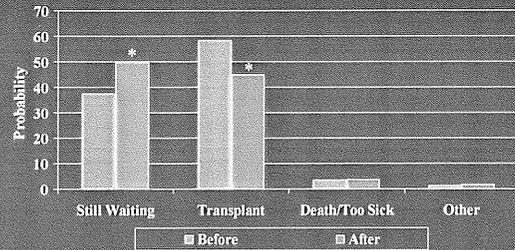
Competing Risk Analysis

2/27/02-2/26/03 vs. 2/27/03-8/27/03

- HCC priority reduced from 24 and 29 → 20 and 24
 - At 90 days after listing, assess probability before and after priority change.
 - Still waiting
 - Transplant
 - Death/too sick
 - Other removal
- } Drop out rate

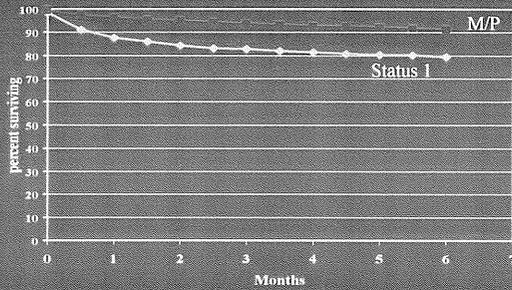
Competing Risks for HCC Exceptions

2/27/02-2/26/03 vs. 2/27/03-8/27/03



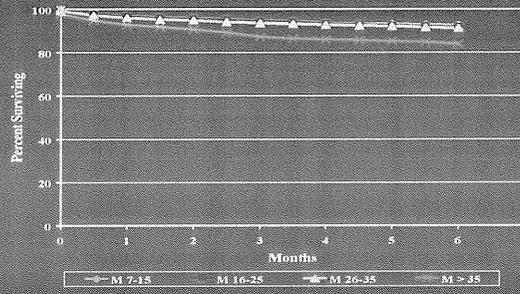
6-Month Patient Survival

2/27/02-12/31/02



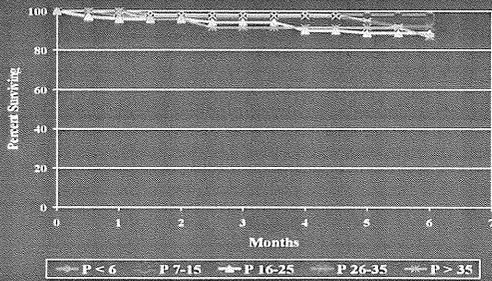
6-Month Patient Survival

Standard MELD, 2/27/02-12/31/02



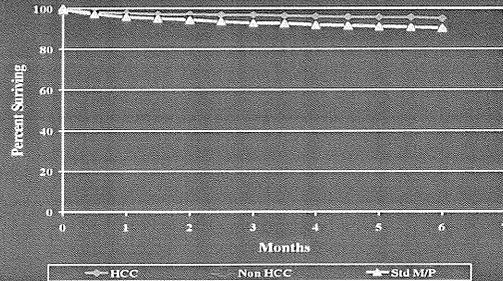
6-Month Patient Survival

Standard PELD, 2/27/02-12/31/02



6-Month Patient Survival

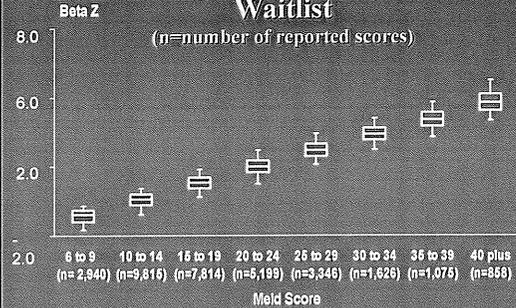
02/27/02-12/31/02



Improving MELD For Liver Allocation

Russell H. Wiesner, M.D.
 Mayo Clinic
 Rochester, Minnesota

Linear Predictor by MELD on Waitlist



Impact of Serum Sodium In Predicting Survival on Cirrhotic Patients Listed for Liver Transplantation

Correlation of MELD Score and Hyponatremia

Concordance for Three Months Morbidity

MELD	0.77	PNS
MELD & Sodium	0.80	

Mayo Clinic MELD Model Data

Villamil Studied 262 Patients Listed for Liver Transplant

MELD Score	Hyponatremia
<15	9%
15-24	28%
>24	43%

Impact of Hyponatremia In Cirrhotic Patients Listed for OLT and Followed For 3 Months

	Hyponatremia
Alive Waiting	12%
Transplanted	41%
Died Waiting	63%

Concordance Using MELD and Sodium Levels

	C-Score	
	<u>3 Months Mortality</u>	
Hyponatremia	0.753	
Sodium	0.784	
MELD	0.894	
Meld & Sodium	0.908	P < 0.026

Looking beyond MELD / PELD

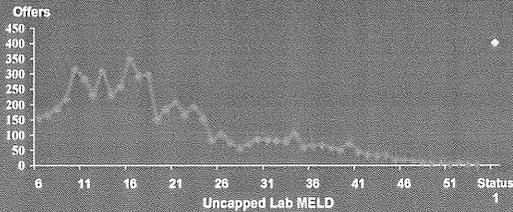
Death rates on the wait list are only part of the story

Evolving Concepts in Liver Allocation in the MELD/PELD Era

Robert Wolfe, Ph.D.
SRTR

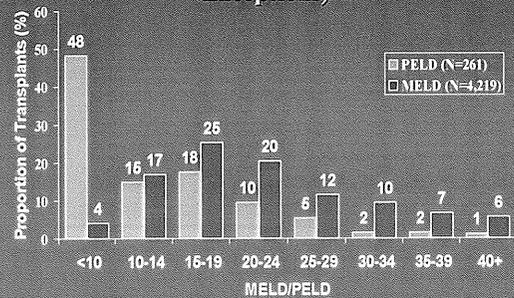
MELD of First Offer (4/1/02-7/31/03)*

Many First Offers to MELD 10-18 Candidates (No Higher MELD Candidates in DSA of OPO?)



*Excludes offers to patients with exception scores

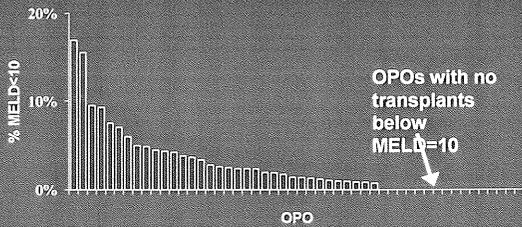
Transplant Distribution by Lab MELD/PELD (Excludes Status 1 and Exceptions)



Deceased Donor Transplants from 4/1/2002 -

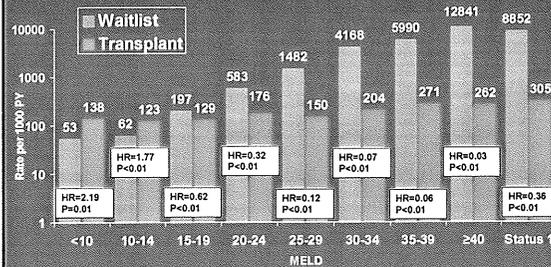
% MELD < 10 at Cadaveric Transplant Varies by OPO

(2/27/02-10/31/03)



Adults only; Status 1 and exception patients excluded

Mortality Rates by MELD



**Action Items From Evolving
Concepts Meeting**
Consensus

- PELD data is insufficient to draw conclusions, make recommendations about policy changes
- Revision of status 1 definition for children should be strongly considered

**Action Items From Evolving
Concepts Meeting**
Action Item 1

- Recommend Local Status 1, Regional Status 1, Local MELD ≥ 15 , Regional MELD ≥ 15 , Local all, Regional all, National Status 1, etc.
 - Non absolute method of implementing minimum transplant score

**Action Items From Evolving
Concepts Meeting**
Action Item 2

- Recommend minimal listing for Adults MELD ≥ 10
 - RRB approval for patients < 10

**Action Items From Evolving
Concepts Meeting**
Action Item 3

- Recommend same priority for HCC T2 lesions
 - Reduce priority for T1 lesions ≥ 1 cm in diameter
 - 24 points for lesions ≥ 1 cm in diameter and AFP ≥ 400
 - No extra priority for lesions < 1 cm
- Extra priority (24 points) for single lesions ≤ 6.5 cm that have been ablated.
 - 2-3 month CT scan
 - If enlarging revert back to calculated score
- RRB prospective approval for all other HCC

**Action Items From Evolving
Concepts Meeting**
Action Item 4

- Amend UNET to collect serum sodium data at each MELD/PELD change

Briefing Paper Proposed Modifications to Policy 3.6 (Adult Donor Liver Allocation Algorithm).

Summary

This proposal would modify the sequence of allocation for adult donor livers such that organs would be allocated to local and regional candidates with MELD/PELD score of 15 or higher prior to candidates with MELD/PELD scores less than 15. The intent of the policy is to direct livers towards those patients who are likely to receive the greatest benefit from liver transplantation. This briefing paper summarizes the proposal that was circulated for public comment in March 2004, the Committee's responses to the public and regional comments received, and the Committee's final recommendation to the OPTN/UNOS Board of Directors.

Background

Currently, deceased donor livers are allocated first to local and regional Status 1 (urgent) candidates, then to local candidates in descending order of MELD or PELD scores, prior to allocation at the regional level. Historically, the sequence of allocation has been to candidates on the local list prior to regional or national distribution, with the exception of the most urgent patients. When the MELD/PELD system for allocation was being refined for implementation, the OPTN/UNOS Liver and Intestinal Organ Transplantation Committee discussed the possibility of redefining the primary distribution units for organ allocation. At the time, the Committee resolved that there was no consensus within the transplant community regarding the benefit of redrawing the distribution units. However, in a resolution approved by the OPTN/UNOS Board in November 2000, the Committee encouraged regions to *"continue to develop broader sharing mechanisms, not just for Status 1 patients but for all patients by whatever means available... to broaden the sharing of livers for patients."* The Committee further stated that *"Until such time as the MELD score is implemented, it is premature to make any recommendations regarding allocation distribution because it is likely that the MELD score will have a greater impact on directing organs to patients most in need."* This proposal would broaden sharing for those patients most likely to benefit from a liver transplant, based on data accumulated from the first 18 months of the MELD/PELD allocation policy.

The MELD/PELD system allocates livers based upon the risk of death while awaiting transplantation and does not take post-transplant outcomes into account. Beginning in May 2003, the Liver and Intestinal Organ Transplantation Committee began to review analyses conducted by the Scientific Registry of Transplant Recipients (SRTR) regarding the net benefit of liver transplantation. The concept "net benefit" compares the amount of time a patient would be expected to live after receiving a transplant versus the amount of time a similar patient would have lived without a transplant. A summary measure of net benefit is contained in the hazard ratio (HR). In non-technical terms, the HR represents the ratio of transplant and waiting list death rates for a given MELD/PELD score within a specified time period after transplant. A hazard ratio less than 1.0 indicates that death rates among transplanted recipients are lower than death rates among candidates remaining on the waiting list with the same MELD/PELD score. Thus, when less than 1.0, the HR indicates a benefit from transplantation; values greater than 1.0 suggest that the risk of death post-transplant is greater than the risk of death while awaiting transplant. The SRTR examined differences in the benefit of transplantation based upon MELD/PELD categories, demographic subgroups, time since transplantation, and donor age (as a surrogate for expanded criteria donor liver). A Cox regression model was fitted to estimate the covariate-adjusted HR. The model adjusted for age, gender, race, diagnosis, MELD/PELD score and the change in the MELD/PELD score over time (Δ MELD/PELD).

The Committee reviewed analyses provided by the SRTR during the May 2003 and July 2003 meetings (Attachment 1). A brief summary of the findings provided to the Committee in May 2003, based upon the cohort of patients listed for a liver transplant between September 2001 and July 2002, is as follows:

- For patients with a MELD/PELD score less than 10, the risk of waiting list death is 59 per 1000 patients-years; the rate for patients with a MELD/PELD score of 40 or higher is 5321 per 1000-patients years.
- When computed for each MELD/PELD category, patients in the less than 10 category demonstrated an 80% higher mortality rate with a transplant than while on the waiting list (HR=1.81, p=0.12).

- Patients in the 10-19 category demonstrated a significant benefit with transplantation (HR=0.68, p=0.03). As MELD/PELD increased, the hazard ratio decreased, indicating an increasing benefit to transplantation, with statistically significant results.

An update of the data, provided in July 2003, confirmed earlier results. The HR for MELD scores less than 10 was 1.6, with a 95% confidence interval of (0.70,3.67). This result, while not indicating a statistically significant hazard of transplant (confidence intervals containing 1.00 are not statistically significant), was consistent with the earlier analysis in failing to demonstrate a transplant benefit for low MELD/PELD patients despite additional follow-up time. The survival benefit for MELD/PELD scores of 10 and greater, as tested in 10-point categories was statistically significant, as in the previous analysis.

Report from Evolving Concepts in Liver Allocation in the MELD PELD Era: Summary Report of a National Conference

In February 2004, the Committee reviewed the “Report from Evolving Concepts in Liver Allocation in the MELD PELD Era: Summary Report of a National Conference.” The conference took place on December 8, 2003, and was organized to address the current listing and allocation issues and to develop a consensus paper reflecting the conclusions of the conference attendees. A total of 51 centers and organizations were represented at this conference. The sponsoring organizations included the AST, ASTS, OPTN (UNOS), SRTR, HRSA, AASLD, and ILTS. The data presented by the SRTR regarding the benefit of transplantation, using an updated cohort (patients listed between September 2001 and April 2003) were consistent with earlier findings:

“As demonstrated by the 18-month MELD outcomes (Fig 1), adult patients with a low MELD score are at a low risk of death while waiting as compared to patients at higher MELD scores. There is still, however, a small but measurable death rate on the waiting list at this score (54 deaths per 1000 patient years (Fig 2)). The group looked closely at the transplant benefit analysis presented by Dr. Wolfe and noted that for adults, patients with MELD scores below 15 had a higher relative risk of mortality if given a transplant compared with patients with similar MELD scores who stayed on the list while at that MELD score. This indicates that, at least in the 1-year post-transplant follow-up period, candidates with MELD scores below 15 received no survival benefit.

The group felt that these data were sufficiently robust to conclude that transplantation of candidates with MELD scores in this range, in the presence of other patients with higher MELD scores within an OPTN region, is not the best use of the donor pool.¹”

The working group assigned to this issue felt that organs should be directed towards those who would most likely benefit from transplantation. Under the existing system, 21% of all adult liver transplants were for recipients whose MELD scores were less than 15. It was suggested that the distribution system could be modified such that patients with MELD scores of 15 or higher would be offered organs before patients with MELD scores below 15. The conference report concluded that this action “in effect establishes a ‘minimum transplant score’ but does not absolutely prevent lower score patients from getting organs.” This was presented to the Liver Committee as a recommendation that regional sharing for candidates with MELD scores of 15 or higher would occur prior to local candidates with MELD scores less than 15.

The Liver Committee considered the proposed allocation algorithm, which would allocate adult livers as follows:

- Local Status 1 Candidates
- Regional Status 1 Candidates
- Local Candidates with MELD/PELD scores \geq 15
- Regional Candidates with MELD/PELD scores \geq 15
- Local Candidates with MELD/PELD scores $<$ 15
- Regional Candidates with MELD/PELD scores $<$ 15
- National Status 1 Candidates

¹ Olthoff, KM, Brown R, Delmonico F, Freeman RB, Lucey M, McDiarmid S, Merion R, Millis JM, Roberts JP, Shaked A, Wiesner R. Evolving Concepts in Liver Allocation in the MELD/PELD Era: Summary Report of a National Conference. Feb 2004.

- National Candidates by descending MELD/PELD score

It was recognized that there may be a subset of patient in the 10-14 range that may benefit from transplantation; this proposed allocation policy would not preclude these patients from receiving a transplant. Committee members felt that this approach would achieve the goal of reducing the number of organs transplanted in patients who have not been shown to benefit from transplant. Having considered these data at two prior meetings, and with the understanding that the benefit of transplantation appears to be realized at or above a MELD score of 15, the Committee agreed that the proposal should be circulated for public comment, and also requested that the proposed scenario be modeled by the SRTR. For those children that can accept an adult donor, the preference would be granted to patients with PELD scores of 15 or higher as well. The Committee noted that a proposal to assign MELD scores to pediatric adolescent patients was also being circulated for public comment at this time. The Committee clarified that that the algorithm uses the match score, and patients with RRB-approved exceptions for HCC or other diagnoses would be included in the higher priority group for Regional sharing if their approved MELD/PELD score is 15 or greater.

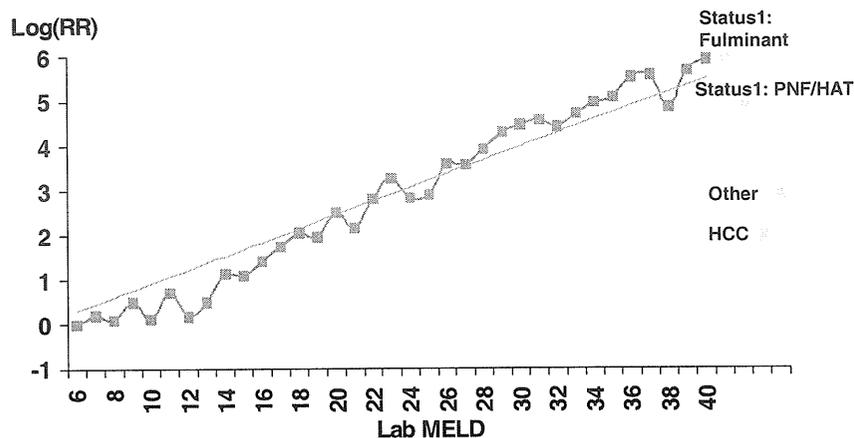
The Committee approved the following motion:

** Resolved, that policy 3.6 be modified as described below, to be circulated for public comment and modeled using LSAM.

Committee Vote: 20 in favor, 1 opposed, 1 abstention.

Figure 1: Log (RR) of Waitlist Death while at
MELD Level

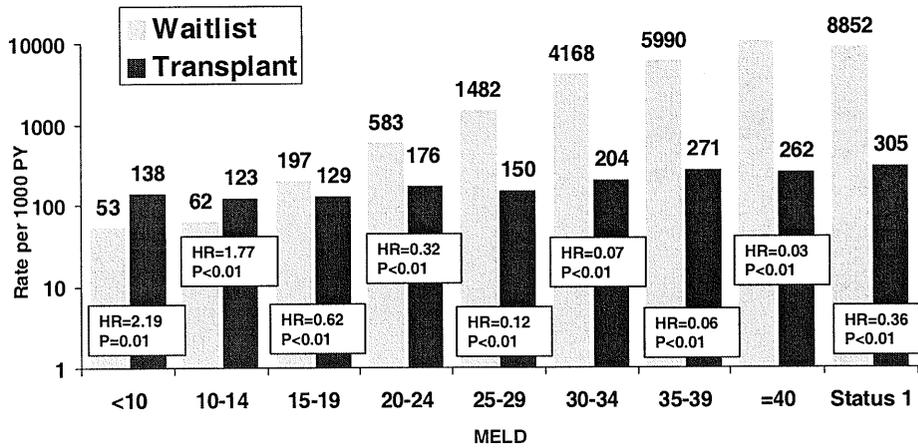
Patients Added to the List 2/27/02-2/26/03



*Censored at earliest of transplant, removal from the waitlist for reason of improved condition, next transplant, day 60 at status 1 or end of study; unadjusted; includes exception score patients (HCC 24 and 29 rules); follow-up through 9/30/03

Wolfe # 2206

Figure 2: Mortality Rates by MELD



Wolfe # 2228

Review of Public and Regional Comments

As of April 29, 2004, 108 responses had been submitted to UNOS regarding this policy proposal. Of these, 30 (27.78%) supported the proposal, 34 (31.48%) opposed the proposal, and 44 (40.74%) had no opinion. Of the 64 who responded with an opinion, 30 (46.88%) supported the proposal and 34 (53.13%) opposed the proposal. Nine Regions voted in favor of the policy, with two opposed. The Committee responded to comments submitted in opposition to the policy (Attachment 2). A programming specification document was also provide for the Committee’s review.

The Committee reviewed the results of the LSAM modeling. Six different scenarios were modeled in addition to the current policy rules (Attachment 3):

- Min10: Uses the current policy, but patients with MELD score of less than 10 are not offered organs.
- Share15: Livers are offered locally and regionally to candidates with MELD/PELD Score of 15 or higher before local candidates with MELD/PELD scores lower than 15
- Combined: Combines Min10 and Share 15.
- Adult15: This system follows the share15 rules for adults, but allocation for pediatric candidates is the same as the current policy.
- Combined Adult: Combines Adult15 and Min10.
- Combined and Adolescent MELD and Pediatric Share (CAMPS): This utilizes the Combined system, incorporating the use of the MELD score for adolescents and regional sharing for pediatric donor livers to children aged 0-11.

The difference in the number of transplants to small children, adolescents, and adults varied by policy. The Share15 and Combined yielded a reduction in transplants to pediatric patients, while the Adult15 increase the number of pediatric transplants by 45 and decreased the number of adult transplant by 49. The Combined Adult and CAMPS models increase pediatric transplants without having as great a decrease in the number of adult transplants. The distribution of transplants by age group and for Status 1s and MELD/PELD score was shown for each proposal. The overall number of deaths as compared to the current policy was decreased by 43 for the Adult 15, but is reduced by a total of 71 by adding in the Min10. In terms of life years gained compared to the current policy, Combined

and Combined Adults showed an increase of 26 years. The Committee decided not to vote on one of the models shown, as none exactly matched the proposals that were circulated for public comment. However, Combined Adult was very similar to this proposal combined with the proposal for sharing for MELD/PELD scores greater than 15.

Policy Proposal

Having responded to the public comments and reviewed the LSAM modeling, the Committee continued to support the proposal. The Committee submits the following resolution for consideration by the Board of Directors:

***** RESOLVED, that subsequent to consideration of the public comment, Policy 3.6 (Adult Donor Liver Allocation) shall be amended as follows and implemented upon completion of programming in the UNOS system:**

Adult Donor Liver Allocation Algorithm

Local

1. Status 1 patients in descending point order

Regional

2. Status 1 patients in descending point order

Local

3. ~~All other patients in descending order of mortality risk scores (probability of candidate death)~~

Regional

4. ~~All other patients in descending order of mortality risk scores (probability of candidate death)~~

Local

3. Patients with MELD/PELD Scores ≥ 15 in descending order of mortality risk scores (probability of candidate death)

Regional

4. Patients with MELD/PELD Scores ≥ 15 in descending order of mortality risk scores (probability of candidate death)

Local

5. Patients with MELD/PELD Scores < 15 in descending order of mortality risk scores (probability of candidate death)

Regional

6. Patients with MELD/PELD Scores < 15 in descending order of mortality risk scores (probability of candidate death)

National

7. Status 1 patients in descending point order
5. ~~All other patients in descending order of mortality risk scores (probability of candidate death)~~
8. ~~All other patients in descending order of mortality risk scores (probability of candidate death)~~

Committee Vote: 21 in favor, 1 opposed, 0 abstentions.

**Scientific Registry of
Transplant Recipients**

**Scientific Advisory
Committee (SAC)**

*July 23, 2003
Chicago, IL*

SRTR

**Liver Transplant Benefit
in the
MELD/PELD Era**

SRTR

**Liver Transplant Benefit
in the
MELD/PELD Era**

Douglas Schaubel, Robert Merion,
Robert Wolfe, Dawn Dykstra,
Fritz Port

SRTR

Objectives

- Quantify survival benefit of liver transplant compared to waitlist
- Examine differences in transplant benefit by:
 - MELD/PELD categories
 - Demographic subgroups
 - Time since transplantation
 - Donor age
- Determine patient subgroups which do not benefit from liver transplantation

SRTR

Study Population

- Patients with initial waitlisting from September 2001 to July 2002
- Exclusions: patients granted exceptions
- Final sample size: n=7,271
- 2,823 patients received a liver transplant
- Follow-up (post-transplant):
 - min: 6 months; max: 12 months

SRTR

Follow-up Time: Waitlist, Transplant

- Patients contribute follow-up to waitlist group until transplant, transplant group thereafter
- Censored at living donor transplant
- Transplant (vs. waitlist) is a time-dependent covariate

SRTR

MELD/PELD, Δ MELD/PELD

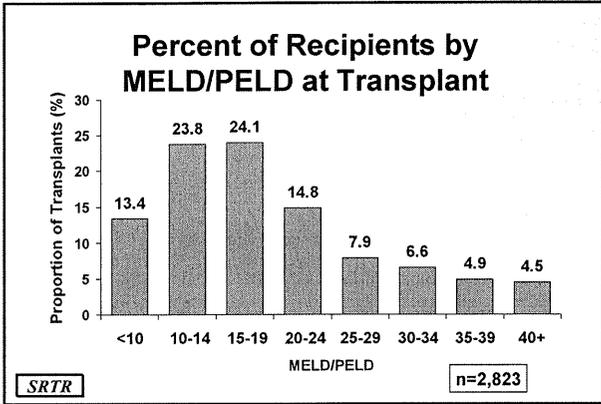
- MELD/PELD changes were tracked for each patient
- MELD/PELD treated as constant between dates of reported changes
- Adjusted for Δ MELD/PELD
 - based on current and most recent previous MELD/PELD
 - computed as a true slope
- MELD/PELD, Δ MELD/PELD: time-dependent covariates

SRTR

Survival Models

- Since follow-up limited, survival benefit measured by ratio of death rates, as opposed to life expectancy
- Cox regression used to estimate covariate-adjusted hazard ratio (HR)
 - HR represents ratio of transplant:waitlist death rates, for patients in same covariate cross-classification
- Covariates adjusted for: age, sex, race, diagnosis, MELD/PELD, Δ MELD/PELD

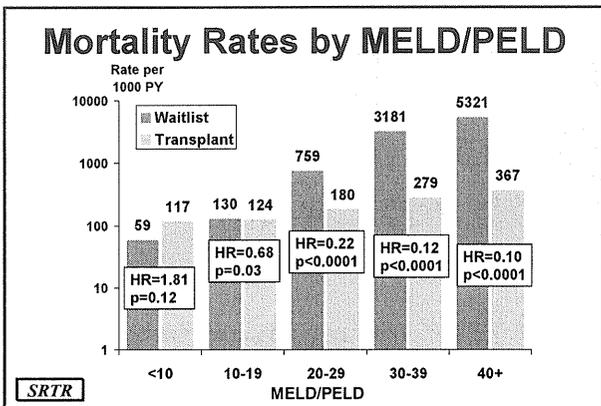
SRTR



Waitlist vs. Transplant Overall Mortality Rates, Adjusted HR

	Deaths	Patient Years	Crude rate (per 1000 PY)	Adjusted HR	(95% CI)
Waitlist	1,108	4,590	241.4	1.00	Ref.
Transplant	147	801	183.5	0.21	(0.17, 0.25)

SRTR



Effect of MELD/PELD Waitlist, Transplant

Patients	HR	(95% CI)
Waitlist	1.15	(1.14, 1.16)
Transplant	1.03	(1.01, 1.04)

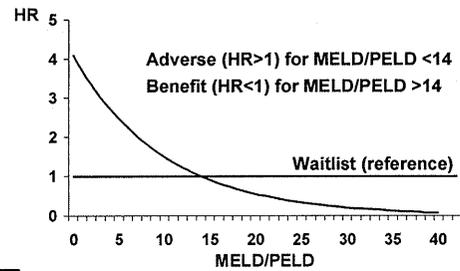
SRTR

Transplant Futility Analysis for Uncapped MELD/PELD >40

MELD/PELD	HR	(95% CI)
40	0.13	(0.05, 0.34)
>40 (per unit beyond 40)	0.95	(0.87, 1.04)

SRTR

Mortality Hazard Ratio by MELD/PELD



SRTR

MELD/PELD at which HR=1

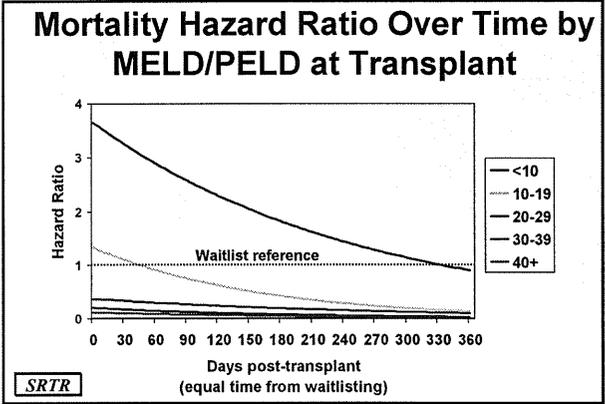
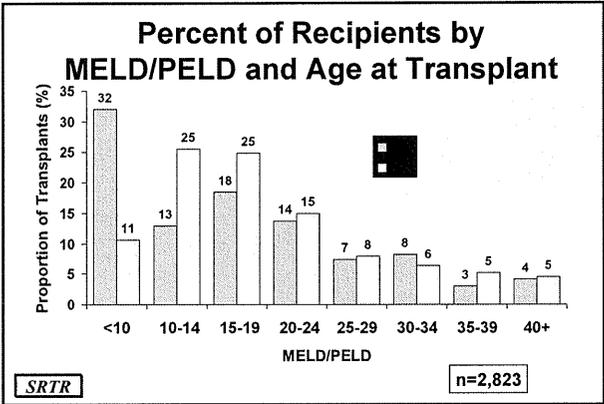
Age	HR (MELD=10)	HR (per unit increase in MELD/PELD)	MELD/PELD where HR=1
<18	1.06	0.94	11
18-39	1.47	0.95	17
40-49	1.74	0.88	14
50-59	1.62	0.88	14
60+	1.47	0.89	13

SRTR

Mortality Hazard Ratios Pediatric, Adult

MELD/PELD	Pediatric		Adult	
	HR	(95% CI)	HR	(95% CI)
<10	2.51	(0.74, 8.51)	1.52	(0.66, 3.48)
10-19	0.42	(0.14, 1.27)	0.81	(0.59, 1.14)
20-29	0.31	(0.13, 0.77)	0.25	(0.17, 0.35)
30+	0.09	(0.03, 0.25)	0.10	(0.08, 0.13)
Total	0.29	(0.17, 0.49)	0.18	(0.15, 0.21)

SRTR



Transplant Benefit by Donor Age

Donor Age	HR	(95% CI)
<20	0.18	(0.13, 0.27)
20-39	0.19	(0.14, 0.26)
40-59	0.20	(0.15, 0.27)
60+	0.29	(0.20, 0.43)

SRTTR

Distribution of Donor Ages by MELD at Transplant

	age	age	age	age
MELD	0-19	20-39	40-59	60+
<10	20	40	31	10
10-19	14	45	37	14
20-29	14	38	35	13
30-39	16	35	33	15
40+	15	38	35	12

SRTTR

Transplant Benefit by Recipient Diagnosis

Diagnosis	HR	(95 % CI)
Acute Hepatic Necrosis	0.34	(0.21, 0.55)
Cholestatic Cirrhosis	0.11	(0.05, 0.29)
Non-Cholestatic Cirrhosis	0.15	(0.11, 0.19)
Other	0.28	(0.19, 0.41)

SRTR

Transplant Benefit Pre- vs. Post MELD/PELD

Allocation Era	HR	(95 % CI)
pre-MELD/PELD	0.26	(0.19, 0.37)
post-MELD/PELD	0.19	(0.15, 0.24)

SRTR

Limitations: Data

- Maximum 1 year of post-transplant follow-up currently available
- Peri-operative mortality may have undue influence for MELD/PELD < 10 subgroup
- when longer follow-up is available, transplant benefit may be observed in MELD/PELD < 10 subgroup

SRTR

Limitations: Methods

- Current analysis: considers updated MELD/PELD
 - unhealthiest patients are systematically removed from lower MELD waitlist categories
- Potential bias: may underestimate transplant benefit for low MELD subgroups; overestimate at high MELD
- Alternative methods currently under investigation

SRTR

Conclusions (1)

- Liver waitlist mortality is almost 5-fold higher than post-transplant mortality during first post-transplant year, adjusted for updated MELD/PELD and other covariates
- Survival benefit increases with increasing MELD/PELD
- Adjusted post-transplant mortality is higher than waitlist mortality for MELD/PELD <10 for the first 11 months post-transplant

SRTR

Conclusions (2)

- Transplant benefit is observed within 6 weeks for MELD/PELD >10
- No evidence of transplant futility at high MELD/PELD
- Some evidence that MELD/PELD allocation has improved magnitude of transplant benefit

SRTR

Summary of Public Comments: Item #12

Proposed Modifications to OPTN/UNOS Policy 3.6 (Adult Donor Liver Allocation Algorithm). (Liver and Intestinal Organ Transplantation Committee)

As of 4/29/2004, 108 responses have been submitted to UNOS regarding this policy proposal. Of these, 30 (27.78%) supported the proposal, 34 (31.48%) opposed the proposal, and 44 (40.74%) had no opinion. Of the 64 who responded with an opinion, 30 (46.88%) supported the proposal and 34 (53.13%) opposed the proposal. Comments on the proposal received to date are as follows:

I: Individuals Comments:

Comment 1:

vote: Oppose

Over the previous 2 years, MELD has been proposed as the only parameter on which all liver disease patients are being evaluated and scored. Unfortunately, it is far from ideal. I cite the following reasons: a. Serum creatinine is not a good measurement of liver disease severity; it is not even a good measurement of renal disease severity. UNOS however, has resisted using creatinine clearance in the MELD calculations. b. Serum bilirubin levels denote a degree of severity that varies from patient to patient and from disease to disease. For example, a cholestatic liver disease patient will be considered less at risk for the serum bilirubin level when compared to a patient with non-cholestatic liver disease. UNOS again has resisted making this provision in the MELD calculations, perhaps indicating a bias in favor of centers with larger population of cholestatic liver disease patients. Indeed, the MELD system was introduced by the center with the largest proportion of cholestatic liver disease population in their liver transplant recipients. c. Patients with acute hepatitis (e.g. alcoholic hepatitis) often have higher serum bilirubin, which improves as the acute process subsides. UNOS has resisted making these provisions in MELD calculations. d. INR is subject to therapeutic manipulations. 2. MELD system does not allow patients with other highly significant and equally morbid stigmata of liver disease to gain additional points that allow them to obtain a liver transplant quicker. For example, patients with history of Spontaneous Bacterial Peritonitis (SBP), Hepato-pulmonary syndrome, sever malnutrition/hypoalbuminemia and difficult to control or manage ascites are ignored. Of note, these problems often plague patients coming from poor socioeconomic status. These patients are ignored by the MELD system and UNOS. 3. Mandating regional sharing for chronic liver disease and using MELD system to dictate minimal listing criteria will be counterproductive by depriving the local OPOs and the local community from the positive feed-back of organ donation efforts, without reduction in mortality or morbidity on the local waiting list. This is especially true of small to medium sized OPOs and transplant programs (20-40 liver transplants/year). It is generally believed that UNOS is less sensitive to the needs of programs this size, as shown by this new policy. 4. MELD system implementation has yet to show that it will significantly reduce mortality in liver transplant recipient waiting list. (Freeman et al in Liver Transpl. 2004 Jan; 10(1):7-15). 5. It appears that this new drive for broadening MELD implementation is being driven by a single paper (Trotter et al in Jama. 2004 Apr 21; 291(15):187-4) with significant statistical and clinical anomalies and oversights.

** NOTE: There were 16 other entries that were identical to Comment #1.

Committee Response: The Committee responds that the use of the MELD score is well justified, as data have shown that it is reducing waiting list mortality. Regarding the assertion that “the proposal would be counter-productive by depriving local OPOs and the local community from the positive feed-back of organ donation efforts,” there has been no evidence that broader sharing reduces willingness to donate. Furthermore, the system still maintains local primacy, in that the organs would first be offered to local patients with MELD/PELD scores of 15 or greater. Regarding the statement that INR is subject to therapeutic manipulation, the Committee recommends that

the UNOS Policy Compliance auditors begin to collect data on those cases when the INR is inflated due to Coumadin use. Finally, this proposal predates the publication of the Trotter paper, and the rationale is different from paper's conclusions.

Comment 18:

vote: Oppose

1. Although some patients with MELD 5cm, or more than 3 tumors, should not be prohibited access to cadaveric donors for appropriate patients. In particular, older or steatotic donors, and donors at risk for transmission of viral or malignant processes may represent appropriate risks for patients with intermediate stage HCC. No defensible justification exists for mandating sharing of such donors regionally prior to offering them to appropriate local HCC patients. 4. This policy will increase costs and occasionally waste transplantable allografts. Transportation costs will needlessly be increased, because such organs can likely be transplanted locally into appropriate recipients. Cold ischemic times are increased in donors transported region-wide and in marginal or at-risk donors will result in increased rates of primary non-function or poor early graft function. Such risk is acceptable for Status 1 patients, but it is not acceptable to increase PNF and PEGF rates to transplant patients several hours more distant over appropriate MELD < 15 patients locally. 5. We are not aware that UNOS has audited sufficiently to ensure adherence to the MELD system. Until such audits demonstrate that no systematic cheating on the MELD system is occurring, institution of regional sharing for chronic liver disease (MELD) patients will punish patients at compliant centers. Further, this policy will immediately increase pressure on the Regional Review Boards via applications for special upgrades of certain < 15 MELD patients. This process will further distort the MELD system if upgrades are granted, will further penalize deserving patients if the RRB's cannot identify them for upgrade, and will increase distrust and suspicion among transplant centers. 6. We are not aware that any in depth analysis has been performed by UNOS of the < 15 MELD population to ascertain whether certain patients in the category are appropriately considered for liver transplantation. How many of the 21% transplanted with MELD < 15 were appropriately selected by each center? This proposal appears to be based only on a single grand statistical generalization—that mortality outstrips benefit in the OVERALL group. Indeed the current proposal devotes its statistical analysis to a comparison of MELD < 10 with MELD 10-19, and provides a one sentence rationale for the MELD < 15 decision (and offers us NO data). UNOS should further analyze this group to ensure that transplant-deserving subgroups are not being unfairly penalized by this proposed policy. We have practiced a policy of selective transplantation of low MELD patients and strongly believe that this decision should reside with the physicians "on the ground" who can best assess donor and recipient risk and benefit--on a case by case basis. If UNOS analysis identifies individual centers that are not making those judgments, then monitoring and sanctions should be applied. 7. UNOS has not yet demonstrated that a problem of sufficient magnitude exists to warrant restricting physician practice, increasing center-to-region distrust, burdening the RRB's, and necessitating extensive audit-compliance monitoring.

** NOTE: There were 5 other entries that were identical to Comment #18.

Committee Response: The proposal does not preclude the center from using a marginal donor in patient with a MELD score less than 10, if the organ is turned down by the Region and returned to the OPO. However, this group of patients is not shown to benefit from transplantation. The Committee questioned the practice of putting a high-risk liver into a relatively healthy candidate, who by SRTR analysis does not obtain a survival benefit from transplantation even when transplanted with a non-marginal organ. The comment appears to be a negation of the MELD system and the use of objective data.

Comment 24:

vote: Oppose

Disapprove with comments: A change of this type could affect different regions in different ways. In places in which OPOS were in close geographical proximity, patients with higher MELD scores could become multiply listed to the extent that patients with lower MELD scores were only rarely transplanted with the overall result that patient survival and successful organ transplant utilization would be significantly lowered.

Committee Response: The Committee believes that the proposed system of Regional sharing would reduce multiple listing for patients with higher MELD scores.

Comment 25:

vote: Oppose

I am opposed to Policy 12. First, the more that organs are shipped out of a local area the less inclined individuals will be to donate. People quite frankly want to see what they consider to be local resources used locally and not exported. With that said, the sharing of livers for status I patients is fully justified because these individuals will die in a day or two unless they get a new liver. But the same is simply not true for someone with a MELD score of 15,20 or even 25. If you want to increase regional sharing of livers, then make it for individuals who are critically ill and are unlikely to survive without a liver over a short time frame (ie MELD of 35 per 15). In addition, in coming up with these formulas you have to look at survival rates beyond one year. Transplantation takes a big hit initially because of the one year mortality rate of liver transplants of approximately 15%. You should adjust the model to look at 5 year survival. What I think you will find is more of an advantage for transplantation at all MELD scores, even less than 15.

Committee Response: While the benefit to patients with lower MELD/PELD scores will increase over time, the benefit to the patients with high MELD/PELD scores will still be greater over time than for the candidates with lower scores. The Kaplan-Meier curves appear to be relatively parallel after one year.

Comment 26:

vote: Oppose

I strongly oppose proposal 3.6 on the following grounds. The proposal favors larger OPO's which serve several liver transplant programs over smaller OPO's in the same region which may only serve a single center. The proposal will lead to liver grafts leaving the local community which may adversely affect donor rates. This sharing agreement for chronic liver disease does not allow transplant provider to consider other clinical factors outside the MELD scoring system (refractory ascites, encephalopathy, recurrent cholangitis) to determine an individual patient's need for liver transplant. This proposal will likely result in a decrease in post transplant survival. Finally, the proposed modification does not address the disparity in liver graft availability between adjacent UNOS Regions. If we are sharing for the greater good of our sickest potential recipients, why confine this to the arbitrary UNOS regional borders?

Committee Response: There has been no evidence provided that broader sharing reduces willingness to donate. The Committee believes that the proposal will actually improve overall outcomes.

Comment 27:

vote: Oppose

Many patients with MELD scores below 15 have life threatening complications that would benefit from transplant

Committee Response: In these cases, the center may petition the Regional Review Board for an exceptional case.

Comment 28:

vote: Oppose

The sharing of livers for status 1 patients is fully justified because these individuals will die in several days if they don't get a new liver. The same is simply not true for someone with a MELD score of 15 to 25. If you want to increase regional sharing of livers, then make it for individuals who are critically ill and are unlikely to survive without a liver over a short time frame(MELD 35 not 15) Lastly the more our local area ships out organs, the less inclined individuals will be to donate.

Committee Response: There has been no evidence that broader sharing reduces willingness to donate. Furthermore, this proposal still allocates organ first to the local unit.

Comment 29:

vote: Oppose

We are adamantly opposed to this proposal. This proposal again disadvantages patients at the local level who will constantly be placed in a subordinate position for getting a liver unless they happen to be Status I patient. There will be a flow of organs out of the local regions to those programs with larger lists, resulting in a disenchantment with continued donation and procurement in local areas. Communities look to needs of their most closest citizens. A constant flow of organs out of local areas run counter to that perception of need.

Committee Response: Please see response to Comment 28.

Comment 30:

vote: Support

Strongly support

Committee Response:

Comment 31:

vote: Support

This allows for the true meaning of the MELD/PELD. Those pts who are the sickest should be receiving the organs first, even if they are not local.

Committee Response:

March 2004

REGIONAL COMMENT SUMMARY

PROPOSAL 12: Proposed Modifications to OPTN/UNOS Policy 3.6 (Adult Donor Liver Allocation Algorithm). (Liver and Intestinal Organ Transplantation Committee)

Sponsoring Committee: Liver and Intestinal Organ Transplantation Committee

Description: This proposal would modify the sequence of allocation for adult donor livers such that organs would be allocated to local and regional candidates with MELD/PELD score of 15 or higher prior to candidates with MELD/PELD scores less than 15. The intent of the policy is to direct livers towards those patients who are likely to receive the greatest benefit from liver transplantation.

DATE THIS DOCUMENT MODIFIED: 5/3/04

Region	Meeting Date	Motion to Approve as Written	Approved as Amended (See Below)	Approved by Consensus	Did Not Consider
1	3/22/04	11 yes, 1 no, 2 no opinion			
2	5/07/04	25 yes, 3 no, 3 no opinion			
3	3/26/04	9 yes, 7 no, 1 no opinion			
4	4/2/04	30 yes, 0 no, 0 no opinion			
5	4/30/04	19 yes, 15 no, 2 no opinion			
6	4/2/04	15 yes, 27 no , 11 no opinion			
7	4/23/04	6 yes, 11 no , 0 no opinion			
8	4/2/04	21 yes , 1 no, 2 no opinion			
9	4/21/04	18 yes, 0 no, 1 no opinion			
10	4/30/04	15 yes , 3 no, 1 no opinion			
11	3/26/04	13 yes , 5 no, 2 no opinion			

COMMENTS:

Region 2: Although the region approved this proposal, there was some concern that some candidates would be disadvantaged by this system because their MELD/PELD score does not accurately reflect their need for transplant. In addition, due to the strict nature of the RRB in Region 2, it is unlikely that these patients would get approval through the RRB exceptional case process for an increased score.

Region 7: The region voiced the opinion that they would like to see language added that speaks directly to the use of marginal livers within the policy. The centers in this region that typically utilize large numbers of marginal livers are concerned that the inclusion of marginal livers in this allocation scheme will increase ischemic time and ultimately mean that those livers will not be placed with any donor. Secondly, the language, as written, states MELD/PELD and the region felt strongly that pediatric candidates should not be included in this allocation algorithm.

Scientific Registry of Transplant Recipients

Liver and Intestinal
Organ Transplantation Committee

May 20, 2004
Boston, Massachusetts

Simulation Modeling of Alternative Liver Allocation Systems

LSAM Results of Modifications to
Current Allocation Policy



Methods

- Data on 26,897 waitlist candidates and 5,528 deceased donor livers available between 4/1/02 and 4/1/03 were used in the simulations
- LSAM allocation rules were varied and the distribution of transplants and deaths were compared among the current and six modified allocation systems
- All simulation results for were averaged over 10 iterations



Summary of Modified Allocation Rules*

Min10: Adult candidates with MELD scores < 10 were not offered organs

Share15: A candidate with a MELD or PELD score ≥ 15 is offered an organ regionally before a candidate with a score < 15 is offered the organ locally

Combined: Includes changes from Min10 and Share15

*Details are given on pages 45-47 of the meeting packet



Summary of Modified Allocation Rules*

Adult15: Pediatric candidates are not included in regional priority to MELD or PELD ≥ 15

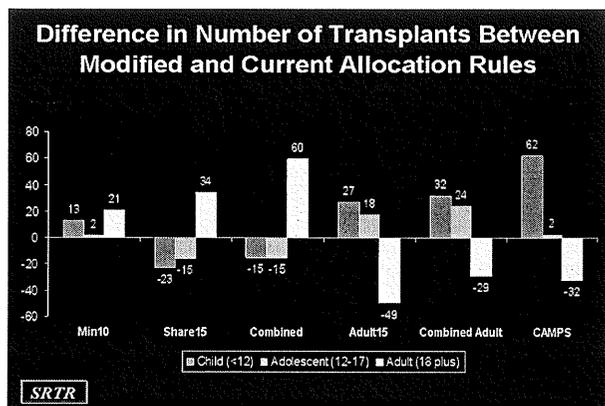
Combined Adult: Incorporates modifications from Min10 and Adult15

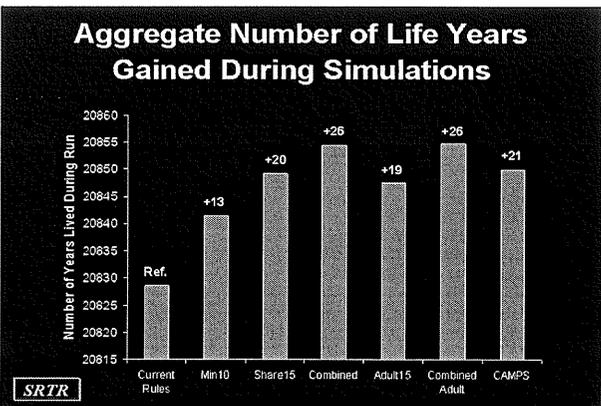
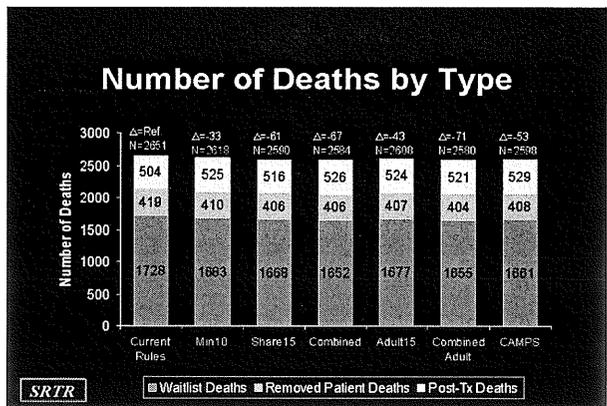
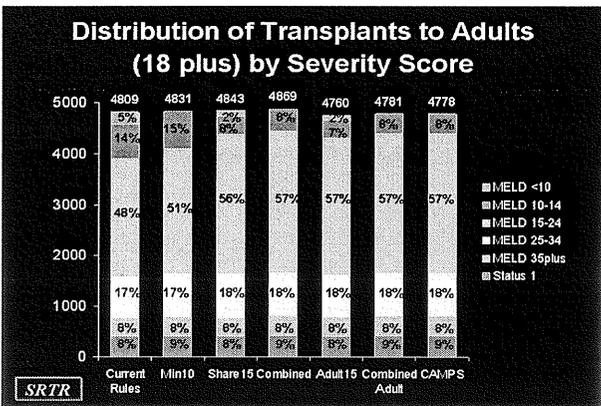
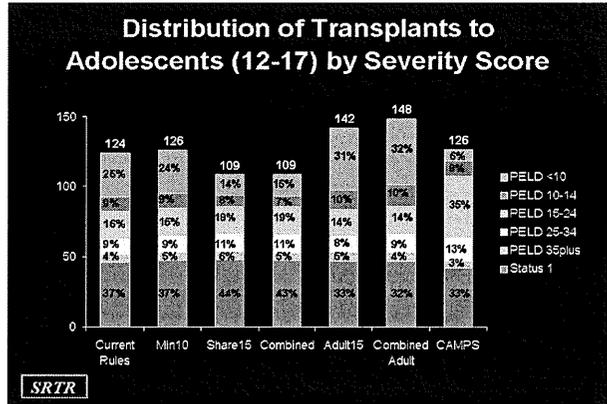
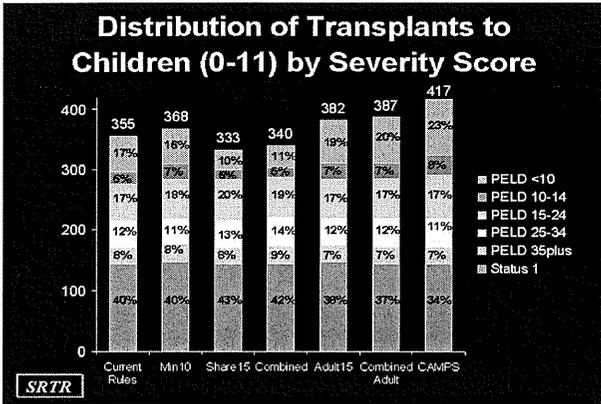
CAMPS: Includes the following changes

- Min10 & Share15
- Adolescent candidates use MELD rather than PELD
- Regional sharing of pediatric donor livers to children (0-11)

*Details are given on pages 45-47 of the meeting packet







Summary

- All of the Modified allocation policies are predicted to decrease the number of transplants to adult patients with low MELD and an increase the number of high MELD transplants
- Looked at individually the share15 and adult15 systems resulted in fewer adult transplants to patients with MELD < 15 than the Min10 system
- Combining the Min10 system to share15 and adult15 is predicted to further decrease the number of adult transplants for candidates with MELD < 15 by 53 and 60 respectively

Summary

- The modified rules which included pediatric patients in the regional priority for MELD and PELD scores ≥ 15 resulted in a reduction in the number of pediatric transplants compared to current rules
- The adult15, combined adult, and CAMPS systems resulted in an increase in the number of pediatric transplants performed

SRTR

Summary

- The increase in pediatric transplants under the adult15 and combined adult systems is largely due to an increase in the number of adult donor livers allocated to pediatric candidates
- The increase in pediatric transplants under the CAMPS system results from an increase in the number of pediatric donor livers allocated to candidates under 12

SRTR

Summary

- The modified systems predicted fewer total deaths over the simulated year than the current rules, with the combined adult system resulting in the lowest number (71 fewer than current)
- The modified systems also resulted in an increase in the aggregate number of life years lived during the simulation with the combined and combined adult systems producing the largest increase of 26 years

SRTR

Scientific Registry of Transplant Recipients

Liver and Intestinal Organ Transplantation Committee

May 20, 2004
Boston, Massachusetts

SRTR

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Scientific Registry of Transplant Recipients

Briefing Paper Modifications to Policy 3.6.4.1 (Liver Allocation, Adult Patient Status)

Summary

This proposal would institute minimum listing criteria of a MELD score of 10 for adult candidates, with the exception of candidates meeting the requirements of Policy 3.6.4.4 (Liver Transplant Candidates with Hepatocellular Carcinoma) and 3.6.4.5 (Liver Candidates with Exceptional Cases). Patients with Stage T1 HCC could be listed with their laboratory MELD score upon prospective agreement by the Regional Review Board. Patients listed at the time the policy is implemented whose MELD score is less than 10, as well as candidates whose MELD scores fall below the threshold of 10 after appropriate listing, would not be removed from the list. Analyses of OPTN data indicate that there is no demonstrable benefit of transplantation below a MELD score of 10 during the first year post-transplant. This briefing paper summarizes the proposal that was circulated for public comment in March 2004, the Committee's responses to the public and regional comments received, and the Committee's final recommendation to the OPTN/UNOS Board of Directors.

Background

Currently, the liver allocation policy stipulates that adult patients must have a Child-Turcotte-Pugh (CTP) score of 7 or higher to be listed. The previous status-based system specified that, to be listed in the least-urgent status category (Status 3), an adult candidate must require "continuous medical care and have a CTP score greater than or equal to 7." At the time the first minimal listing criteria for adult candidates were developed, the charge to the Committee was to develop "objective" criteria that would identify potential recipients who would benefit from transplantation. Under the guidelines approved by the OPTN/UNOS Board of Directors in 1996, the listing criteria for alcoholic cirrhosis, primary biliary cirrhosis and primary sclerosing cholangitis were based upon prognostic indices or scoring systems that had been reported in the medical literature. For these diagnoses, patients would be eligible for listing when their disease progressed to the point that the probability of survival for one year was approximately 95% as estimated by one of these scoring systems. A fairly early stage of disease was recommended as a minimum criteria for listing because the experience with these systems for prospectively estimating the prognosis for individual patients was limited. For other hepatic diseases, either the presence of the disease or other staging indicators pertinent to that disease were to be used for minimum listing criteria. At the time the status codes used for adult liver allocation were revised to incorporate the CTP score in 1997, the Committee felt that the use of CTP score of 7 would approach the objective of the minimum listing criteria. Exceptions could be referred to the Regional Review Board.

As of February 27, 2002, patients awaiting liver transplantation are ranked using their MELD or PELD scores, which are accurate predictors of the patient's risk of waiting list mortality within 3 months. At the time the policy was implemented, the OPTN/UNOS Liver and Intestinal Organ Transplantation Committee did not feel that sufficient data were available in order to define a minimum listing requirement based upon MELD or PELD scores and chose to retain the prior CTP-based requirement. During the May 2003 meeting, the Committee reviewed analyses conducted by the Scientific Registry of Transplant Recipients (SRTR) utilizing data collected under the MELD/PELD allocation system. This analysis provided the Committee with a clearer understanding of the relationship between a patient's MELD score and the patient's net benefit from transplantation. The calculation of "net benefit" is based upon a comparison of the amount of time a similar patient would be expected to live after receiving a transplant versus the amount of time the patient would have lived without a transplant. Both adjusted and unadjusted analyses were reviewed and both led to the same conclusion.

The SRTR examined differences in the benefit of transplantation based upon MELD/PELD categories, demographic subgroups, time since transplantation, and donor age (as a surrogate for expanded criteria donor liver). A Cox regression model was fitted to estimate the covariate-adjusted hazard ratio (HR), which represents the ratio of transplant and waiting list death rates. The model adjusted for age, gender, race, diagnosis, MELD/PELD score and the change in the MELD/PELD score over time (Δ MELD/PELD).

An HR of less than 1.0 indicates that death rates among transplanted recipients are lower than death rates among candidates remaining on the waiting list with the same MELD/PELD score. Thus, when less than 1.0, the HR indicates a benefit from transplantation; values greater than 1.0 suggest that the risk of death post-transplant is greater than the risk of death while awaiting transplant.

The Committee reviewed analyses provided by the SRTR during the May 2003 and July 2003 meetings. A brief summary of the findings provided to the Committee in May 2003, based upon the cohort of patients listed for a liver transplant between September 2001 and July 2002, is as follows:

- For patients with a MELD/PELD score less than 10, the rate of waiting list death is 59 per 1000 patients-years; the rate for patients with a MELD/PELD score of 40 or higher is 5321 per 1000-patients years.
- When computed for each MELD/PELD category, patients in the less than 10 category demonstrated an 80% higher mortality rate with a transplant than while on the waiting list (HR=1.81, p=0.12).
- Patients in the 10-19 category demonstrated a significant benefit with transplantation (HR=0.68, p=0.03). As MELD/PELD increased, the hazard ratio decreased, indicating an increasing benefit to transplantation, with statistically significant results.

An update of the data, provided in July 2003, confirmed earlier results (Attachment 1). The HR for MELD scores less than 10 was 1.6, with a 95% confidence interval of (0.70,3.67). This result, while not indicating a statistically significant hazard of transplant (confidence intervals containing 1.00 are not statistically significant), was consistent with the earlier analysis in failing to demonstrate a transplant benefit for low MELD/PELD patients despite additional follow-up time. The survival benefit for MELD/PELD scores of 10 and greater was statistically significant, as in the previous analysis.

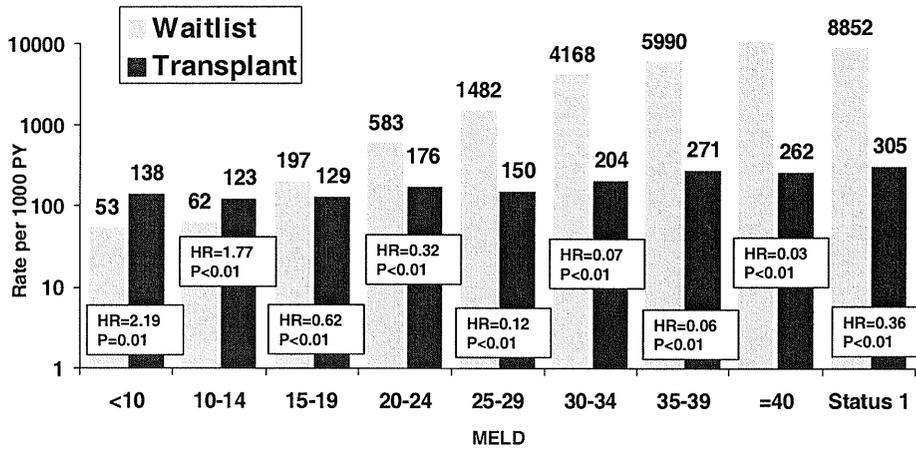
In July 2003, the Committee proposed that a minimum listing criteria of a MELD/PELD of 10 be proposed for public comment, as the data indicated that there is little or no benefit from transplantation for patients with low MELD and PELD scores. This proposal was deferred by the OPTN/UNOS Executive Committee, due to concerns raised by the Pediatric Transplantation Committee regarding appropriateness of this minimum listing score for children due to the limited amount of pediatric data accumulated thus far. The Executive Committee also recognized that this topic would be addressed at a national consensus conference scheduled for December 2003.

Report from Evolving Concepts in Liver Allocation in the MELD PELD Era: Summary Report of a National Conference

In February 2004, the Committee reviewed the "Report from Evolving Concepts in Liver Allocation in the MELD PELD Era: Summary Report of a National Conference." The conference took place on December 8, 2003, and was organized to address the current listing and allocation issues and to develop a consensus paper reflecting the conclusions of the conference attendees. A total of 51 centers and organizations were represented at this conference. The sponsoring organizations included the AST, ASTS, OPTN (UNOS), SRTR, HRSA, AASLD, and ILTS. The data presented by the SRTR regarding the benefit of transplantation, using an updated cohort (patients listed between September 2001 and April 2003) were consistent with earlier findings (Figure 1). In summary, patients with a MELD score of less than 10 had an HR of 2.19 (p=0.01), while patients with MELD scores in the 10-14 range had an HR of 1.77 (p<0.01). Thus, patients in these lower MELD score categories were seen to have no benefit, and may experience potential harm, from transplantation. The benefit of transplantation was demonstrated beginning with the 15-19 MELD range (HR=0.62, p<0.01) with increasing benefit throughout the higher ranges of MELD scores.

The consensus report recommended that "a minimal MELD of 10 should be required for placement on the UNOS waiting list. Candidates with scores less than 10 could be entered on the waiting list after approval of the RRB."

Figure 1: Mortality Rates by MELD



Wolfe # 2228

Liver Committee discussion

The Liver Committee considered this recommendation, which was consistent with its earlier proposal. Committee members discussed the potential effectiveness of the proposal in light of their recommendation of Regional sharing for MELD/PELD scores of 15 and higher, which is also being circulated for public comment at this time. It was reiterated that the purpose of allocation using the MELD score was to direct livers towards those patients most in need of a transplant. The proposal to allocate livers to patients with MELD scores of 15 or higher above patients with MELD scores of less than 15 should reduce the number of livers transplanted in patients with low MELD scores without restricting access to the waiting list. It was not clear what the combined impact of the two proposals might be, if both are approved and implemented. The Committee asked that the minimum listing proposal be modeled by the SRTR using their LSAM model.

Several Committee members expressed concern that the proposal may restrict transplant hepatology care for patients with low MELD scores, as it was hypothesized that patients may have better survival under the care of a transplant hepatologist. The Committee suggested that, in conjunction with the proposal, a statement be made by UNOS that some patients with MELD scores less than 10 should still be under the care of a transplant hepatologist. One member commented that the decision to refer for hepatology care should be made by the local program based upon each individual patient’s medical circumstances. There was also concern that potentially useful data, such as the risk of death in relation to the progression of patients’ MELD scores, would be lost if patients with low MELD score were not allowed to be listed.

After discussion, the Committee voted to approve the policy to be circulated for public comment by a vote of 12 in favor, 9 opposed, and 2 abstentions. There was agreement that the policy should allow patients with approved exceptions to be listed even if their calculated MELD score is less than 10. Patients with Stage T2 HCC may be listed in accordance with Policy 3.6.4.4. Patients with Stage T1 HCC could be listed at their calculated MELD score if approved by the RRB. The Committee discussed how patients whose MELD scores drop below 10 should be managed; it was decided that patients would be allowed to remain on the list once they meet the criteria at listing. Similarly, patients with MELD scores less than 10 who are on the list at the time of implementation would remain on the list.

Review of Public and Regional Comments

As of the end of the comment period, 106 responses had been submitted to UNOS regarding this policy proposal. Of these, 36 (33.96%) supported the proposal, 23 (21.70%) opposed the proposal, and 47 (44.34%) had no opinion. Of the 59 who responded with an opinion, 36 (61.02%) supported the proposal and 23 (38.98%) opposed the proposal. Six Regions voted to approve the proposal, with 5 opposed. Most of the opposition related to the concern for hepatology care. The Committee responded to comments submitted in opposition to the policy (Attachment 2). A programming specification document was also provide for the Committee's review.

The Committee discussed the potential effects of this proposal. Committee members remained concerned that patients would not be referred early enough with if the minimum listing criteria is put into effect, and that this might be seen as a restriction of access to care. There was no evidence available that the current minimum criteria of a CTP of 7 was deterring physicians from referring patients for transplants. It was reiterated that patients with lower MELD scores who are in need of a transplant may be listed through the Regional Review Board. One member commented that the professional societies (AST, AASLD) should be setting the standards for referral and listing rather than UNOS. With this proposal, the OPTN would also lose the ability to track disease progression for these patients. However, there are likely many thousands of patients with chronic liver disease are currently not being referred for transplantation and are therefore not being tracked. The value of listing patients with low MELD score for tracking purposes was discussed; SRTR data indicate for most patients who are listed with a MELD of less than 10, the increase in 6 months is only 2 MELD points. Finally, it was noted that the net-benefit analyses were based on groups of patients, and it was recognized that results will vary based on individual patients and donors. There is no model yet available based upon specific candidates and organs. The SRTR analysis does not show net benefit for those patients with MELD scores less than 10. Furthermore, any measurable benefit for these candidates will be lower than for patients with higher MELD scores. After lengthy discussion, the question was called, and the Committee voted on the proposal.

Policy Proposal

The Committee submits the following resolution for consideration by the Board of Directors.

*** **RESOLVED, that subsequent to consideration of the public comment, Policies 3.6 (Adult Patient Status), 3.6.4.4 (Liver Transplant Candidates with Hepatocellular Carcinoma (HCC)) and 3.6.4.5 (Liver Candidates with Exceptional Cases) shall be amended as follows and implemented upon completion of programming in the UNOS system:**

3.6.4.1 Adult Patient Status. Medical urgency is assigned to an adult liver transplant patient (greater than or equal to 18 years of age) based on either the criteria defined below for Status 1, or the patient's mortality risk score as determined by the prognostic factors specified in Table 1 and calculated in accordance with the MELD Scoring System. A patient who does not meet the criteria for Status 1, or have a MELD score that, in the judgment of the patient's transplant physician, appropriately reflects the patient's medical urgency, may nevertheless be assigned to Status 1 or a higher MELD score upon application by his/her transplant physician(s) and justification to the applicable Regional Review Board that the patient is considered, by consensus medical judgment, using accepted medical criteria, to have an urgency and potential for benefit comparable to that of other patients listed as Status 1 or having the higher MELD score. The justification must include a rationale for incorporating the exceptional case as part of the Status 1 criteria or the MELD calculation. A report of the decision of the Regional Review Board and the basis for it shall be forwarded to UNOS for review by the Liver and Intestinal Organ Transplantation and Membership and Professional Standards Committees to determine consistency in application among and within Regions and continued appropriateness of the Status 1 and MELD criteria. ~~During the initial implementation of the MELD/PELD scoring system, the minimum listing criteria in effect prior to~~

~~implementation of the MELD/PELD system (a CTP score of 7) shall remain in effect. Adult patients must have a MELD score of 10 or higher in order to be added to the waiting list; once listed with a MELD score of 10, the patient may remain listed even if the MELD score drops below 10. Patients who are on the list with a MELD score of less than 10 at the time of policy implementation may remain on the waiting list.~~

<< No further changes to 3.6.4.1 >>

- 3.6.4.4 Liver Transplant Candidates with Hepatocellular Carcinoma (HCC).** Patients with Stage II HCC in accordance with the modified Tumor-Node-Metastasis (TNM) Staging Classification set forth in Table 3 that meet all of the medical criteria specified in (i) and (ii) may receive extra priority on the waiting list as specified below. A patient with an HCC tumor that is greater than or equal to 2 cm and less than 5cm or no more than 3 lesions, the largest being less than 3 cm in size (Stage T2 tumors as described in Table 3) may be registered at a MELD/PELD score equivalent to a 15% probability of candidate death within 3 months. Patients with Stage T1 HCC may be listed at the calculated MELD score upon prospective approval by the RRB.

<< No further changes to 3.6.4.4 >>

- 3.6.4.5 Liver Candidates with Exceptional Cases.** Special cases require prospective review by the Regional Review Board. The center will request a specific MELD/PELD score and shall submit a supporting narrative. The Regional Review Board will accept or reject the center's requested MELD/PELD score based on guidelines developed by each RRB. Each RRB must set an acceptable time for Reviews to be completed, within twenty-one days after application; if approval is not given within twenty-one days, the patient's transplant physician may list the patient at the higher MELD or PELD score, subject to automatic referral to the Liver and Intestinal Organ Transplantation and Membership and Professional Standards Committees. Exceptions to MELD/PELD score must be reapplied every three months; otherwise the patient's score will revert back to the patient's current calculated MELD/PELD score. If the RRB does not recertify the MELD/PELD score exception, then the patient will be assigned a MELD/PELD score based on current laboratory values. A patient's approved score will be maintained if the center enters the extension application more than 3 days prior to the due date and the RRB does not act prior to that date (i.e., the patient will not be downgraded if the RRB does not act in a timely manner). If the extension application is subsequently denied then the patient will be assigned the laboratory MELD score. Patients whose MELD score is less than 10 may be listed at their calculated MELD score upon prospective approval of the RRB.

Committee Vote: 16 in favor, 6 opposed, 1 abstentions.

**Scientific Registry of
Transplant Recipients**

**Scientific Advisory
Committee (SAC)**

*July 23, 2003
Chicago, IL*

SRTR

**Liver Transplant Benefit
in the
MELD/PELD Era**

SRTR

**Liver Transplant Benefit
in the
MELD/PELD Era**

**Douglas Schaubel, Robert Merion,
Robert Wolfe, Dawn Dykstra,
Fritz Port**

SRTR

Objectives

- Quantify survival benefit of liver transplant compared to waitlist
- Examine differences in transplant benefit by:
 - MELD/PELD categories
 - Demographic subgroups
 - Time since transplantation
 - Donor age
- Determine patient subgroups which do not benefit from liver transplantation

SRTR

Study Population

- Patients with initial waitlisting from September 2001 to July 2002
- Exclusions: patients granted exceptions
- Final sample size: n=7,271
- 2,823 patients received a liver transplant
- Follow-up (post-transplant):
 - min: 6 months; max: 12 months

SRTR

Follow-up Time: Waitlist, Transplant

- Patients contribute follow-up to waitlist group until transplant, transplant group thereafter
- Censored at living donor transplant
- Transplant (vs. waitlist) is a time-dependent covariate

SRTR

MELD/PELD, Δ MELD/PELD

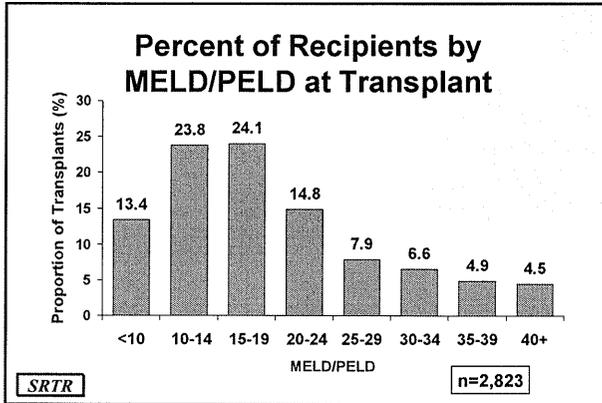
- MELD/PELD changes were tracked for each patient
- MELD/PELD treated as constant between dates of reported changes
- Adjusted for Δ MELD/PELD
 - based on current and most recent previous MELD/PELD
 - computed as a true slope
- MELD/PELD, Δ MELD/PELD: time-dependent covariates

SRTR

Survival Models

- Since follow-up limited, survival benefit measured by ratio of death rates, as opposed to life expectancy
- Cox regression used to estimate covariate-adjusted hazard ratio (HR)
 - HR represents ratio of transplant:waitlist death rates, for patients in same covariate cross-classification
- Covariates adjusted for: age, sex, race, diagnosis, MELD/PELD, Δ MELD/PELD

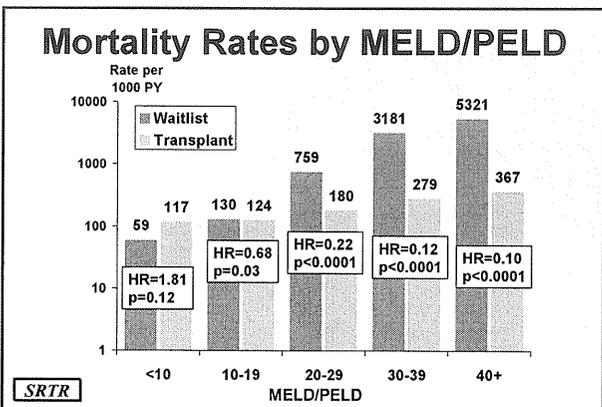
SRTR



Waitlist vs. Transplant Overall Mortality Rates, Adjusted HR

	Deaths	Patient Years	Crude rate (per 1000 PY)	Adjusted HR	(95% CI)
Waitlist	1,108	4,590	241.4	1.00	Ref.
Transplant	147	801	183.5	0.21	(0.17, 0.25)

SRTR



Effect of MELD/PELD Waitlist, Transplant

Patients	HR	(95 % CI)
Waitlist	1.15	(1.14, 1.16)
Transplant	1.03	(1.01, 1.04)

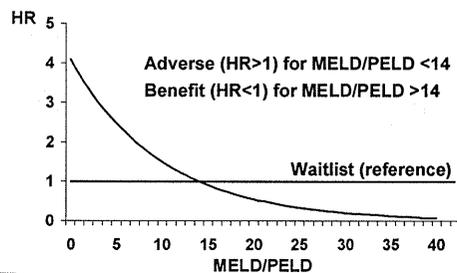
SRTR

Transplant Futility Analysis for Uncapped MELD/PELD >40

MELD/PELD	HR	(95% CI)
40	0.13	(0.05, 0.34)
>40 (per unit beyond 40)	0.95	(0.87, 1.04)

SRTR

Mortality Hazard Ratio by MELD/PELD



SRTR

MELD/PELD at which HR=1

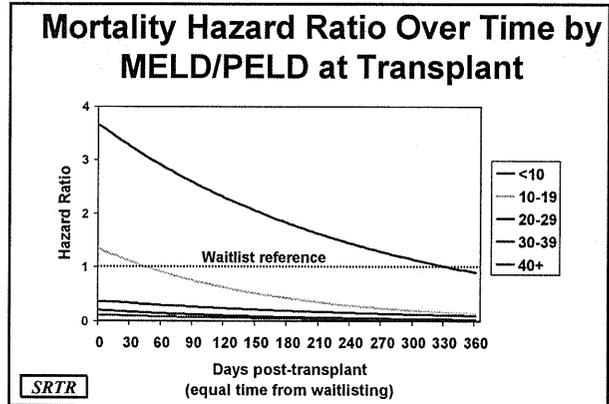
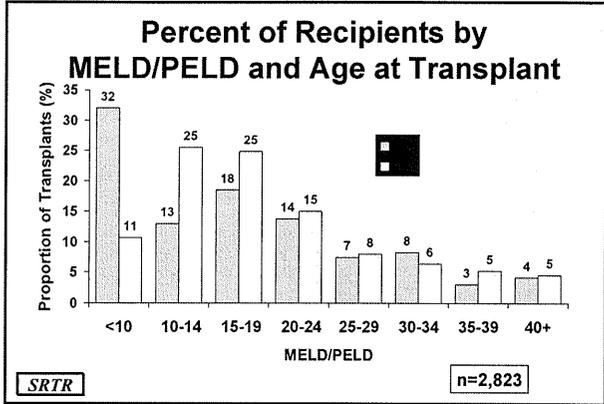
Age	HR (MELD=10)	HR (per unit increase in MELD/PELD)	MELD/PELD where HR=1
<18	1.06	0.94	11
18-39	1.47	0.95	17
40-49	1.74	0.88	14
50-59	1.62	0.88	14
60+	1.47	0.89	13

SRTR

Mortality Hazard Ratios Pediatric, Adult

MELD/PELD	Pediatric		Adult	
	HR	(95% CI)	HR	(95% CI)
<10	2.51	(0.74, 8.51)	1.52	(0.66, 3.48)
10-19	0.42	(0.14, 1.27)	0.81	(0.59, 1.14)
20-29	0.31	(0.13, 0.77)	0.25	(0.17, 0.35)
30+	0.09	(0.03, 0.25)	0.10	(0.08, 0.13)
Total	0.29	(0.17, 0.49)	0.18	(0.15, 0.21)

SRTR



Transplant Benefit by Donor Age

Donor Age	HR	(95% CI)
<20	0.18	(0.13, 0.27)
20-39	0.19	(0.14, 0.26)
40-59	0.20	(0.15, 0.27)
60+	0.29	(0.20, 0.43)

SRTR

Distribution of Donor Ages by MELD at Transplant

MELD	age 0-19	age 20-39	age 40-59	age 60+
<10	20	40	31	10
10-19	14	45	37	14
20-29	14	38	35	13
30-39	16	35	33	15
40+	15	38	35	12

SRTR

Transplant Benefit by Recipient Diagnosis

Diagnosis	HR	(95 % CI)
Acute Hepatic Necrosis	0.34	(0.21, 0.55)
Cholestatic Cirrhosis	0.11	(0.05, 0.29)
Non-Cholestatic Cirrhosis	0.15	(0.11, 0.19)
Other	0.28	(0.19, 0.41)

SRTR

Transplant Benefit Pre- vs. Post MELD/PELD

Allocation Era	HR	(95 % CI)
pre-MELD/PELD	0.26	(0.19, 0.37)
post-MELD/PELD	0.19	(0.15, 0.24)

SRTR

Limitations: Data

- Maximum 1 year of post-transplant follow-up currently available
- Peri-operative mortality may have undue influence for MELD/PELD < 10 subgroup
- when longer follow-up is available, transplant benefit may be observed in MELD/PELD < 10 subgroup

SRTR

Limitations: Methods

- Current analysis: considers updated MELD/PELD
 - unhealthiest patients are systematically removed from lower MELD waitlist categories
- Potential bias: may underestimate transplant benefit for low MELD subgroups; overestimate at high MELD
- Alternative methods currently under investigation

SRTR

Conclusions (1)

- Liver waitlist mortality is almost 5-fold higher than post-transplant mortality during first post-transplant year, adjusted for updated MELD/PELD and other covariates
- Survival benefit increases with increasing MELD/PELD
- Adjusted post-transplant mortality is higher than waitlist mortality for MELD/PELD <10 for the first 11 months post-transplant

SRTR

Conclusions (2)

- Transplant benefit is observed within 6 weeks for MELD/PELD >10
- No evidence of transplant futility at high MELD/PELD
- Some evidence that MELD/PELD allocation has improved magnitude of transplant benefit

SRTR

Summary of Public Comments: Item 13

Proposed Modifications to OPTN/UNOS Policy 3.6.4.1 (Liver Allocation, Adult Patient Status) (Liver and Intestinal Organ Transplantation Committee)

As of 4/29/2004, 106 responses have been submitted to UNOS regarding this policy proposal. Of these, 36 (33.96%) supported the proposal, 23 (21.70%) opposed the proposal, and 47 (44.34%) had no opinion. Of the 59 who responded with an opinion, 36 (61.02%) supported the proposal and 23 (38.98%) opposed the proposal. Comments on the proposal received to date are as follows:

I: Individuals Comments:

Comment 1:

vote: Oppose

Over the previous 2 years, MELD has been proposed as the only parameter on which all liver disease patients are being evaluated and scored. Unfortunately, it is far from ideal. I cite the following reasons: a. Serum creatinine is not a good measurement of liver disease severity; it is not even a good measurement of renal disease severity. UNOS however, has resisted using creatinine clearance in the MELD calculations. b. Serum bilirubin levels denote a degree of severity that varies from patient to patient and from disease to disease. For example, a cholestatic liver disease patient will be considered less at risk for the serum bilirubin level when compared to a patient with non-cholestatic liver disease. UNOS again has resisted making this provision in the MELD calculations, perhaps indicating a bias in favor of centers with larger population of cholestatic liver disease patients. Indeed, the MELD system was introduced by the center with the largest proportion of cholestatic liver disease population in their liver transplant recipients. c. Patients with acute hepatitis (e.g. alcoholic hepatitis) often have higher serum bilirubin, which improves as the acute process subsides. UNOS has resisted making these provisions in MELD calculations. d. INR is subject to therapeutic manipulations. 2. MELD system does not allow patients with other highly significant and equally morbid stigmata of liver disease to gain additional points that allow them to obtain a liver transplant quicker. For example, patients with history of Spontaneous Bacterial Peritonitis (SBP), Hepato-pulmonary syndrome, severe malnutrition/hypoalbuminemia and difficult to control or manage ascites are ignored. Of note, these problems often plague patients coming from poor socioeconomic status. These patients are ignored by the MELD system and UNOS. 3. Mandating regional sharing for chronic liver disease and using MELD system to dictate minimal listing criteria will be counterproductive by depriving the local OPOs and the local community from the positive feed-back of organ donation efforts, without reduction in mortality or morbidity on the local waiting list. This is especially true of small to medium sized OPOs and transplant programs (20-40 liver transplants/year). It is generally believed that UNOS is less sensitive to the needs of programs this size, as shown by this new policy. 4. MELD system implementation has yet to show that it will significantly reduce mortality in liver transplant recipient waiting list. (Freeman et al in Liver Transpl. 2004 Jan; 10(1):7-15). 5. It appears that this new drive for broadening MELD implementation is being driven by a single paper (Trotter et al in Jama. 2004 Apr 21; 291(15):187-4) with significant statistical and clinical anomalies and oversights.

NOTE: There were 16 other entries that were identical to Comment #1.

Committee Response: [Note: This comment was also submitted for Policy 12. The Committee's response to that comment is included here.] The Committee responds that the use of the MELD score is well justified, as data have shown that it is reducing waiting list mortality. Regarding the assertion that "the proposal would be counter-productive by depriving local OPOs and the local community from the

positive feed-back of organ donation efforts,” there has been no evidence that broader sharing reduces willingness to donate. Furthermore, the system still maintains local primacy, in that the organs would first be offered to local patients with MELD/PELD scores of 15 or greater. Regarding the statement that INR is subject to therapeutic manipulation, the Committee recommends that the UNOS Policy Compliance auditors begin to collect data on those cases when the INR is inflated due to Coumadin use. Finally, this proposal predates the publication of the Trotter paper, and the rationale is different from paper’s conclusions.

Comment 18:

vote: Oppose

As one who has dealt with kidney transplants for more than 30 years, I find this proposal a contradiction. We want to transplant the healthiest of dialysis/CRF patients because we know the risks are lower and the quality of life is better. Yet, when it comes to the liver patient, we propose to wait until they are the sickest, highest risk patients to take to surgery and expose them to the most serious consequences. Consequently, we are very much opposed to this proposal. Patients at lower MELD scores should have the opportunity to receive a liver, enjoy a better quality of life, and undertake the surgery when they are in a better clinical condition.

Committee Response: Some data have indicated that candidates transplanted with low MELD scores do not experience a greater improvement in quality of life than candidates who have high MELD scores.

Comment 19:

vote: Oppose

By not allowing patients with a MELD <15 to receive a transplant as easily with the previous policy this policy has limited implications. Those with MELD <10 may well benefit from being on the waiting list with increased level of care.

Committee Response: Under the proposed policy, patients whose MELD score is less than 10 may be listed at their calculated MELD score upon prospective approval of the RRB.

Comment 20:

vote: Oppose

I am opposed to Policy number 13. There are many cirrhotics with refractory or difficult to treat ascites and others with disabling encephalopathy who calculate out to low MELD scores but have severely compromised quality of life. Raising the bar to 10 will eliminate some of these patients from consideration for transplant. In my opinion, these are patients ideally suited for expanded criteria donors. Since their synthetic function is fairly well preserved, they can tolerate a few days

of graft dysfunction much better than sicker, higher MELD patients. Quality of life years is being used more and more in medical outcomes data and should also be applied to liver transplantations.

Committee Response: Please see response to Comments 18 and 19.

Comment 21:

vote: Oppose

I strongly oppose this proposal. All patient should have the right to be list, even if their MELD is 6 to 9. A lot of low MELD scoring patients have severely compromised quality of life, some with difficult to treat ascites or disabling encephalopathy. These patients are aware that the MELD is how livers are allocated, but it is of comfort to know that they are on the list and if they should decompensate they can be updated quickly.

Committee Response: Please see response to Comments 18 and 19.

Comment 22:

vote: Support

Approve - no comments.

Committee Response:

Comment 23:

vote: Support

There are still concerns about the insurance companies using such listing criteria to restrict medical care, i.e. referral to a liver transplant center or hepatologist

Committee Response:

Comment 24:

vote: Support

Very strongly support!!!

Committee Response:

March 2004

REGIONAL COMMENT SUMMARY

PROPOSAL 13: Proposed Modifications to OPTN/UNOS Policy 3.6.4.1 (Liver Allocation, Adult Patient Status) (Liver and Intestinal Organ Transplantation Committee)

Sponsoring Committee: Liver and Intestinal Organ Transplantation Committee

Description: This proposal would institute minimum listing criteria of a MELD score of 10 for adult candidates, with the exception of candidates meeting the requirements of Policy 3.6.4.4 (Liver Transplant Candidates with Hepatocellular Carcinoma) and 3.6.4.5 (Liver Candidates with Exceptional Cases). Patients with Stage T1 HCC could be listed with their laboratory MELD score upon prospective agreement by the Regional Review Board. Patients listed at the time the policy is implemented whose MELD score is less than 10, as well candidates whose MELD scores fall below the threshold of 10 after appropriate listing, would not be removed from the list. Analyses of OPTN data indicate that it is highly unlikely that an adult candidate will benefit with transplantation during the first year post-transplant if their MELD score is 10 or less.

DATE THIS DOCUMENT MODIFIED: 5/3/04

Region	Meeting Date	Motion to Approve as Written	Approved as Amended (See Below)	Approved by Consensus	Did Not Consider
1	3/22/04	3 yes, 9 no , 2 no opinion			
2	5/07/04	11 yes, 13 no , 7 no opinion			
3	3/26/04	16 yes , 0 no, 1 no opinion			
4	4/2/04	16 yes , 8 no , 6 no opinion			
5	4/30/04	19 yes , 14 no, 2 no opinion, 1 no vote			
6	4/2/04	48 yes , 0 no, 5 no opinion			
7	4/23/04	1 yes, 10 no , 2 no opinion			
8	4/2/04	25 yes , 0 no, 0 no opinion			
9	4/21/04	4 yes, 5 no , 9 no opinion			
10	4/30/04	2 yes, 11 no , 6 no opinion			
11	3/26/04	16 yes , 2 no, 2 no opinion			

COMMENTS:

Region 1: The region opposed this proposal for the following reasons: 1) if patients are not allowed to be listed below a specific MELD score, it will be very difficult to collect data on those patients; 2) if patients are not allowed to be listed, they may not qualify for reimbursable transplant hepatology-related services, thus potentially compromising the care they receive.

Region 2: The region opposed this proposal because there was concern that some candidates would be disadvantaged by this system because their MELD/PELD score does not accurately reflect their need for transplant. In addition, due to the strict nature of the RRB in Region 2, it is unlikely that these patients would get approval through the RRB exceptional case process for an increased score. There was also concern that patients may not have access to transplant hepatology services until they are placed on the waiting list.

Region 5: Those who opposed this proposal did so for the following reasons: 1) if patients are not allowed to be listed below a specific MELD score, it will be very difficult to collect data on those patients; 2) if patients are not allowed to be listed, they may not qualify for reimbursable transplant hepatology-related services, thus potentially compromising the care they receive.

Region 9: The region was split evenly between those that had an opinion (9) and those that did not (9). Of those that opined against the proposal (5), it was expressed that patients should continue to be referred to and listed at liver transplant centers with MELD scores below 10, particularly so that the transplantation hepatology services could be accessed. Furthermore, those that opposed the proposal felt that it would be appropriate to not transplant patients with MELD scores less than 10, rather than prohibiting the listing of these patients.

Region 10: The region opposed this proposal for the following reasons: 1) if patients are not allowed to be listed below a specific MELD score, it will be very difficult to collect data on those patients; 2) setting a minimal listing score is creating a precedent of denying access to the list for patients with particular conditions. The region felt that it should be at the discretion of the transplant center if these patients should be transplant at a MELD less than 10 rather than prohibiting them from being listed.

Region 7: The region was concerned that by setting a minimum listing score there will be a restriction on patients' access to transplant centers based on current insurance requirements. The region felt that the data used in the justification of this proposal has not undergone enough analysis to draw conclusions that would equate to policy changes.

** Note : many of these comments are specifically addressed in the section entitled "Review of Public and Regional Comments."

Scientific Registry of Transplant Recipients

Pediatric Liver Subcommittee

May 21, 2004
Boston, Massachusetts

ustransplant.org
Scientific Registry of Transplant Recipients

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Analytical/Inferential Request #1

Waitlist Mortality Rates for Pediatric Candidates

SRTR

Data Requested:

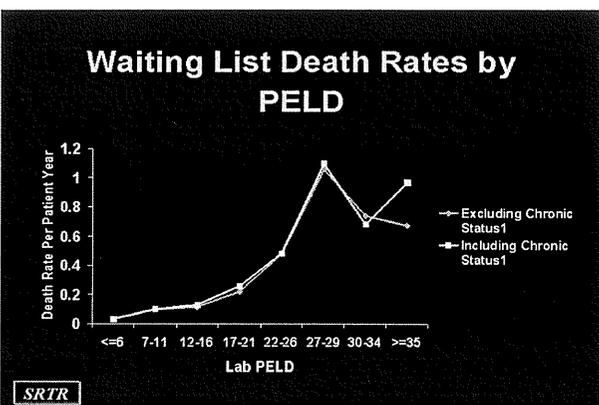
- *Tabulate the PELD scores of chronic Status 1 pediatric patients at the time of death*
- *Rerun the analysis of the risk of waitlist death for different PELD scores, but include the chronic Status 1 patients with their lab PELD score instead of looking at them as a separate group*

SRTR

Methods

- *Study population: pediatric candidates added to the liver waiting list from 2/27/02 to 6/30/03 with follow up through 9/30/03*
- *Waiting list death rates by PELD including chronic status 1 candidates were compared to death rates by PELD excluding chronic status 1 candidates*
- *The most recent PELD scores at the time of death were tabulated for chronic status 1 candidates*

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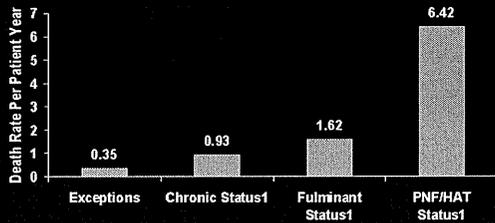


Patient Days and Death Rates for Status1 and Exception Patients

	Median Lab PELD	Total Patient Days at Score	Number of Deaths	Death Rate (Per Patient Year)
Chronic Status1	19.0	3,933	10	0.929
Fulminant Status1	20.0	2,256	10	1.619
PNF/HAT Status1	23.5	398	7	6.424
Exception Patients*	12.0	13,527	13	0.351

SRTR *Non-Status1

Waiting List Death Rates for Status 1 Candidates



SRTR

Lab PELD Scores for Chronic Status 1 Waiting List Deaths

Lab PELD	Number of Deaths
13	1
17	1
21	1
24	1
27	1
36	1
37	1
38	1
40	2
Total	10

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Summary

- Including chronic status 1 candidates in the plot of death rates by lab PELD scores did not have a large effect on the shape of the curve
- The lab PELD scores at the time of death for chronic status 1 candidates ranged from 13 to 40 with a median score of 31.5

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Scientific Registry of Transplant Recipients

Pediatric Liver Subcommittee

May 21, 2004
Boston, Massachusetts

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Briefing Paper

Proposed Modifications to Policies 3.6 (Pediatric Donor Liver Allocation Algorithm & Allocation Sequence for Patients with PELD or MELD Scores Less than or Equal to 6 (All Donor Livers)), 3.6.4.2 (Pediatric Patients Status), 3.6.4.2.1 (Pediatric Patient Reassessment and Recertification Schedule), 3.6.4.3 (Pediatric Liver Transplant Candidates with Metabolic Diseases), and 3.6.4.4.1 (Pediatric Liver Transplant Candidates with Hepatoblastoma).

Summary

Under the proposed modifications, adolescent pediatric liver candidates (age 12-17) would be assigned a MELD score rather than a PELD score. For the majority of adolescent liver candidates, a calculated MELD score offers an increase in allocation score and, thus, an increase in opportunity for transplant. Based on the variables included in allocation score calculation in the MELD system, MELD scores may also offer a more accurate picture of mortality risk and disease severity for adolescent candidates. Adolescents will, however, maintain pediatric status in the policy, including assigned priority for children in the allocation of pediatric donor livers. This briefing paper summarizes the proposal that was circulated for public comment in March 2004, the Committee's responses to the public and regional comments received, and the Committee's final recommendation to the OPTN/UNOS Board of Directors.

Background

Currently, candidates awaiting liver transplantation other than those listed in the most urgent category (Status 1) are prioritized using a point score based on the probability of dying on the waiting list. Adult candidates are assigned a MELD (Model for End-stage Liver Disease) score, which is calculated using creatinine, bilirubin, and INR. Pediatric candidates (age 0-17) are assigned a PELD (Pediatric End-stage Liver Disease) score, which is calculated based on the candidate's age (less than 1 year at listing), albumin, bilirubin, INR, and growth failure. Both scores were developed to estimate the risk of 3-month mortality while awaiting a liver transplant. In general, following allocation to the most urgent (Status 1) candidates, organs are offered sequentially to candidates on the waiting list who are ranked based on MELD or PELD scores. For adult deceased donor liver allocation, both pediatric and adult candidates are considered together; for pediatric deceased donor liver allocation, pediatric candidates are assigned some additional priority.

When the MELD and PELD systems were being considered, the OPTN/UNOS Pediatric Transplantation Committee expressed some concerns that, if a sick pediatric patient does not have growth failure, he or she might be better served by the MELD score rather than the PELD score. Age, too, is a factor in PELD only for young pediatric patients. There was concern that the data available for developing PELD may have resulted in variables that are better predictors of waiting list mortality for young versus older pediatric patients. Thus, it may be to adolescent patients' best advantage to allow them to use either PELD or MELD. At the time, the data were not available to make this assessment, and both the OPTN/UNOS Liver and Intestinal Organ Transplantation and Pediatric Committees recommended the collection of serum creatinine for patients 12 years of age or greater, which would allow the calculation of a MELD score for these candidates, in order to determine the accuracy and appropriateness of the MELD scoring system for older pediatric patients. This data collection was implemented with the MELD system on February 27, 2002. Additionally, the Pediatric Committee requested further dialogue with the Liver Committee regarding development of a process for transitioning pediatric liver patients from pediatric to adult status.

Policy Proposal

The Joint Pediatric-Liver Subcommittee was formed in 2003 to collaboratively examine issues related to pediatric liver transplantation. At its January 2004 meeting, the Subcommittee requested and reviewed several analyses from the SRTR to evaluate waitlist mortality rates by MELD and PELD, transplant benefit by MELD and PELD, and the comparison of MELD and PELD scores for adolescent liver candidates.

The discussions from the January 2004 meeting of the Joint Pediatric-Liver Subcommittee were reviewed during the January 22, 2004 meeting of the Pediatric Transplantation Committee. The Subcommittee agreed that, in terms of allocation score itself, adolescent liver candidates would benefit from using MELD score calculation. It was noted by the Subcommittee that with specific components for age less than 1 year at listing, growth failure, and albumin levels, the PELD scoring system may be weighted more toward younger pediatric candidates. Adolescent candidates may have increased opportunity for transplant using the MELD system for a calculated allocation score and maintaining pediatric status. This would include maintaining pediatric priority in the allocation of pediatric donor livers and pediatric status in the allocation sequence for patients with scores less than or equal to 6. In data prepared by the Scientific Registry of Transplant Recipients (SRTR) for the Joint Subcommittee (Attachment 1), the calculated MELD score for approximately 150 adolescent liver candidates was higher than the corresponding calculated PELD score for all of the candidates except 3. It was noted by the Pediatric Committee that no adolescent candidate in the SRTR data study period (2/27/02 to 8/10/02) had a lower score using MELD calculation; those candidates whose score did not increase, remained at the same score with MELD or PELD. The Subcommittee agreed that adolescent liver candidates should continue to follow the pediatric re-certification schedule. The Subcommittee recommended to the Pediatric Committee and the Liver/Intestine Committee that adolescent liver candidates use MELD system scoring with existing assigned pediatric status (including, for example, pediatric priority for pediatric donor liver allocation). The Pediatric Committee unanimously supported this proposal.

During the February 5, 2004, Liver and Intestinal Organ Transplantation Committee meeting, the Committee reviewed the analyses conducted by the SRTR for the Pediatric Committee. The SRTR had examined the cohort of candidates listed during the first six months of the MELD/PELD allocation policy to determine if it would be better to use the MELD or PELD score for adolescents (age 12-17). In the majority of cases, adolescent candidates would have a higher MELD score than their calculated PELD score. The average calculated MELD score was 5 points higher than their PELD score for pediatric patients without malignant neoplasms. After brief discussion, the Liver Committee agreed with the recommendation of the Joint Subcommittee and the Pediatric Committee, and approved the following resolution:

*** Resolved, that based on data presented and discussions held at the Subcommittee and Committee level, adolescent patients should be assigned a MELD score. Pediatric status in the policy would otherwise be maintained for adolescent patients.

Committee vote: 23 in favor, 0 opposed, 1 abstention.

Review of Public and Regional Comments

As of April 29, 2004, 89 responses had been submitted to UNOS regarding this policy proposal. Of these, 34 (38.20%) supported the proposal, 10 (11.24%) opposed the proposal, and 45 (50.56%) had no opinion. Of the 44 who responded with an opinion, 34 (77.27%) supported the proposal and 10 (22.73%) opposed the proposal. Ten Regions supported the proposal, and one Region had no opinion. The Committee responded to two public comments submitted in opposition to the policy (Attachment 2). A programming specification document was also provide for the Committee's review.

Policy Proposal

Having reviewed the public and regional comments, the Committee submits the following resolution for consideration by the Board of Directors:

*** **RESOLVED, that Policies 3.6 (Pediatric Donor Liver Allocation Algorithm & Allocation Sequence for Patients with PELD or MELD Scores Less than or Equal to 6 (All Donor Livers)), 3.6.4.2 (Pediatric Patients Status), 3.6.4.2.1 (Pediatric Patient Reassessment and Recertification Schedule), 3.6.4.3 (Pediatric Liver Transplant Candidates with Metabolic Diseases), and 3.6.4.4.1 (Pediatric Liver Transplant Candidates with Hepatoblastoma) shall be amended as follows and implemented upon completion of programming in the UNOS system:**

[No changes to policy text until the following]

3.6 Pediatric Donor Liver Allocation Algorithm

Local

1. Pediatric Status 1 patients in descending point order
2. Adult Status 1 patients in descending point order

Regional

3. Pediatric Status 1 patients in descending point order
4. Adult Status 1 patients in descending point order

Local

5. All other pediatric patients with a PELD score or MELD score at or above a 50% risk of 3-month candidate mortality in descending order of mortality risk scores (probability of candidate death)
6. All other adult patients with a MELD score at or above a 50% risk of 3-month candidate mortality in descending order of mortality risk scores (probability of candidate death)
7. All remaining pediatric patients in descending order of mortality risk scores (probability of candidate death)
8. All remaining adult patients in descending order of mortality risk scores (probability of candidate death)

Regional

9. All other pediatric patients with a PELD score or MELD score at or above a 50% risk of 3-month candidate mortality in descending order of mortality risk scores (probability of candidate death)
10. All other adult patients with a MELD score at or above a 50% risk of 3-month candidate mortality in descending order of mortality risk scores (probability of candidate death)
11. All remaining pediatric patients in descending order of mortality risk scores (probability of candidate death)
12. All remaining adult patients in descending order of mortality risk scores (probability of candidate death)

National

13. Pediatric Status 1 patients in descending point order
14. Adult Status 1 patients in descending point order
15. All other pediatric patients with a PELD score or MELD score at or above a 50% risk of 3-month candidate mortality in descending order of mortality risk scores (probability of candidate death)
16. All other adult patients with a MELD score at or above a 50% risk of 3-month candidate mortality in descending order of mortality risk scores (probability of candidate death)
17. All remaining pediatric patients in descending order of mortality risk scores (probability of candidate death)
18. All remaining adult patients in descending order of mortality risk scores (probability of candidate death)

[No additional changes to policy text until the following]

Allocation Sequence for Patients with PELD or MELD Scores Less Than or Equal to 6 (All Donor Livers).

Adult patients and pediatric adolescent patients with a MELD score of 6 will be considered together with ~~all~~ pediatric patients ≤12years with a PELD score less than or equal to 6. These patients will be initially ranked based upon waiting time. Those waiting list positions assigned to pediatric candidates based on this initial ranking (e.g., if the 3rd and 5th on the ranked list are held by pediatric patients) will then be re-distributed amongst the pediatric group based on PELD or MELD score, with the patient with the highest PELD or MELD, as applicable, score receiving the highest available pediatric ranking position. The next available pediatric ranking position will be assigned to the pediatric candidate with the next highest PELD or MELD score. Re-

distribution of pediatric candidates continues until the pediatric candidate with the lowest PELD or MELD score is assigned the last pediatric ranking position.

[No additional changes to policy text until the following]

3.6.4 Degree of Medical Urgency. Each patient is assigned a status code or mortality risk score (probability of candidate death) which corresponds to how medically urgent it is that the patient receive a transplant.

3.6.4.1 Adult Patient Status. [No Changes]

3.6.4.2 Pediatric Patient Status. Medical urgency is assigned to a pediatric liver transplant patient (less than 18 years of age) based on either the criteria defined below for Status 1, or the patient’s mortality risk score as determined by the prognostic factors specified in Table 2 and calculated in accordance with the Pediatric End-Stage Liver Disease Scoring System (PELD) for pediatric candidates <12 years or with the MELD System (defined above in Policy 3.6.4.1) for pediatric candidates 12-17 years. Based on the variables included in allocation score calculation in the MELD system, MELD scores may offer a more accurate picture of mortality risk and disease severity for adolescent candidates. Pediatric candidates 12-17 years will use a risk score calculated with the MELD system while maintaining other priorities assigned to pediatric candidates. A patient who does not meet the criteria for Status 1, does not have a risk of candidate mortality expressed by the PELD or MELD score that, in the judgment of the patient’s transplant physician, appropriately reflects the patient’s medical urgency or was listed at less than 18 years of age and remains on or has been returned to the Waiting List upon or after reaching age 18 may nevertheless be assigned to Status 1 or a higher PELD (less than 12 years of age) or MELD (12 – 17 years old) score upon application by his/her transplant physician(s) and justification to the applicable Regional Review Board that the patient is considered, by consensus medical judgment, using accepted medical criteria, to have an urgency and potential for benefit comparable to that of other patients listed as Status 1 or having the higher PELD or MELD score. The justification must include a rationale for incorporating the exceptional case as part of the Status 1 criteria or the PELD/MELD calculation. A report of the decision of the Regional Review Board and the basis for it shall be forwarded to UNOS for review by the Liver and Intestinal Organ Transplantation and Membership and Professional Standards Committees to determine consistency in application among and within Regions and continued appropriateness of the Status 1 and PELD or MELD criteria. ~~Data required to compute the MELD score (creatinine, INR, bilirubin) must be entered for all candidates 12 years and older.~~

Status	Definition
7	A pediatric patient listed as Status 7 is temporarily inactive. Patients who are considered to be temporarily unsuitable transplant patients are listed as Status 7, temporarily inactive.
1	A pediatric patient listed as Status 1 is located in the hospital's Intensive Care Unit (ICU) due to acute or chronic liver failure has a life expectancy without a liver transplant of less than 7 days and meets at least 1 of the following criteria: <ul style="list-style-type: none"> (i) Fulminant hepatic failure defined as the onset of hepatic encephalopathy within 8 weeks of the first symptoms of liver disease. The absence of pre-existing liver disease is critical to the diagnosis. While no single clinical observation or laboratory test defines fulminant hepatic failure, the diagnosis is based on the finding of stage II encephalopathy (i.e., drowsiness, inappropriate behavior, incontinence with asterixis) in a patient with severe liver dysfunction. Evidence of severe liver dysfunction may be manifest by some or all of the following symptoms and signs: asterixis (flapping tremor), hyperbilirubinemia (i.e., bilirubin>15mg%), marked prolongation of the INR (i.e., >2.5), or hypoglycemia.

- (ii) Primary non-function of a transplanted liver within 7 days of implantation.
- (iii) Hepatic artery thrombosis in a transplanted liver within 7 days of implantation.
- (iv) Acute decompensated Wilson's disease.
- (v) On mechanical ventilator.
- (vi) Upper gastro-intestinal bleeding requiring at least 10 cc/kg of red blood cell replacement which continues or recurs despite treatment.
- (vii) Hepatorenal syndrome: The presence of progressive deterioration of renal function in a patient with advanced liver disease requiring hospitalization for management, with no other known etiology of renal insufficiency, and a rising serum creatinine 3 times baseline. In addition to these major criteria, the patient should meet at least one of the following: a) urine volume < 10 ml/kg/d; b) urine sodium < 10 mEq/l; or c) urine osmolality > plasma osmolality (U/P ratio > 1.0).
- (viii) Stage III or IV encephalopathy unresponsive to medical therapy.
- (ix) Refractory Ascites/Hepato-Hydrothorax: Severe persistent ascites or hepatohydrothorax, defined as any one of the following: unresponsive to diuretic and salt restriction therapy leading to respiratory distress, or requiring supplemental tube feeding, or requiring parenteral nutrition, or requiring supplemental oxygen, or requiring paracentesis.
- (x) Biliary sepsis requiring pressor support of 5 mcg/kg/min of dopamine or greater.

With the exception of hospitalized pediatric liver transplant candidates with Ornithine Transcarbamylase Deficiency (OTC) or Crigler-Najjar Disease Type I, patients who are listed as a Status 1 automatically revert back to their most recent PELD or MELD score after 7 days unless these patients are relisted as Status 1 by an attending physician. Patients must be listed with PELD/MELD laboratory values in accordance with Policy 3.6.4.2.1 (Pediatric Patient Recertification and Reassessment Schedule) at the time of listing. A patient listed as Status 1 shall be reviewed by the applicable UNOS Regional Review Board. A completed Liver Status 1 Justification Form must be received by UNOS on UNetsm for a patient's original listing as a Status 1 and each relisting as a Status 1. If a completed Liver Status 1 Justification Form is not entered into UNetsm when a candidate is registered as a Status 1, the candidate shall be reassigned to their most recent PELD or MELD score. A relisting request to continue a Status 1 listing for the same patient waiting on that specific transplant beyond 14 days accumulated time will result in a review of all local Status 1 liver patient listings.

All other pediatric liver transplant candidates on the UNOS Patient Waiting List shall be assigned a mortality risk score calculated in accordance with the PELD (0-11years) or MELD (12-17years) scoring system. For each liver candidate registration, the listing transplant center shall enter data on the UNOS computer system for the prognostic factors specified in Table 2 for pediatric candidates <12 years or Table 1 for pediatric candidates 12-17years. These data must be based on the most recent clinical information (e.g., laboratory test results and diagnosis) and include the dates of the laboratory tests.

[No additional changes to policy text until the following]

3.6.4.2.1 Pediatric Patient Reassessment and Recertification Schedule. The appropriateness of the PELD or MELD score assigned to each patient listing shall be re-assessed and recertified by the listing transplant center to UNOS in accordance with the following schedule:

Pediatric Patient Reassessment and Recertification Schedule

Status 1	Status recertification every 7 days.	Laboratory values must be no older than 48 hours.
PELD/MELD Score 25 or greater	Status recertification every 14 days.	Laboratory values must be no older than 72 hours.
Score <=24 but > 18	Status recertification every 1 month.	Laboratory values must be no older than 7 days.
Score <= 18 but >=11	Status recertification every 3 months.	Laboratory values must be no older than 14 days.
Score <= 10	Status recertification every 12 months.	Laboratory values must be no older than 30 days.

This reassessment and recertification must be based on the most recent clinical information (e.g., laboratory test results and diagnosis) including the dates of the laboratory tests. In order to recertify, laboratory values must not be older than the "age of laboratory values" specified in the chart above. In order to change a PELD/MELD score voluntarily, all laboratory values must be obtained on the same day. UNOS shall notify the listing transplant center of the need to reassess and recertify a patient's PELD/MELD score within 48 hours of the applicable deadline indicated in the recertification schedule. If a patient is not recertified in accordance with the schedule, the patient shall be re-assigned to their previous lower PELD/MELD score. If a patient has no previous lower PELD/MELD score, and is not recertified in accordance with the schedule, the patient shall be reassigned to a PELD/MELD score of 6.

[No additional changes to policy text until the following]

3.6.4.3 Pediatric Liver Transplant Candidates with Metabolic Diseases (e.g., OTC or Crigler-Najjar Disease Type I). A pediatric liver transplant candidate with a metabolic disease such as Ornithine Transcarbamylase Deficiency (OTC) or Crigler-Najjar Disease Type I shall be assigned the medical urgency ranking, either Status 1 or the PELD (less than 12 years old) or MELD (12 – 17 years old) score, that, in the judgment of the patient's transplant physician, appropriately reflects the patient's medical urgency upon application by his/her transplant physician(s) and justification to the applicable Regional Review Board. The patient, if not already a Status 1, may be upgraded to a Status 1 if the patient is hospitalized for an acute exacerbation of their disease. The patient shall remain a Status 1 as long as he or she remains hospitalized. Decisions by the Regional Review Boards in these cases shall be guided by standards developed jointly by the Liver/Intestinal Organ Transplantation and Pediatric Transplantation Committees. Status 1 cases must receive retrospective review by the applicable RRB. Those cases where a higher PELD or MELD score is requested must receive prospective approval by the applicable RRB within twenty-one days after application; if approval is not given within twenty-one days, the patient's transplant physician may list the patient at the higher PELD or MELD score, subject to automatic referral to the Liver and Intestinal Organ Transplantation and Membership and Professional Standards Committees.

[No additional changes to policy text until the following]

3.6.4.4.1 Pediatric Liver Transplant Candidates with Hepatoblastoma. A pediatric patient with non-metastatic hepatoblastoma who is otherwise a suitable candidate for liver transplantation may be assigned the medical urgency ranking, either Status 1 or the PELD (less than 12 years old) or MELD (12 – 17 years old) score, that, in the judgment of the patient's transplant physician, appropriately reflects the patient's medical urgency upon application by his/her transplant physician(s) and justification to

the applicable Regional Review Board. Decisions by the Regional Review Boards in these cases shall be guided by standards developed jointly by the Liver/Intestinal Organ Transplantation and Pediatric Transplantation Committees. Status 1 cases must receive retrospective review by the applicable RRB. Those cases where a higher PELD (less than 12 years old) or MELD (12 – 17 years old) score is requested must receive prospective approval by the applicable RRB, within twenty-one days after application; if approval is not given within twenty-one days, the patient's transplant physician may list the patient at the higher PELD (less than 12 years old) or MELD (12 – 17 years old) score, subject to automatic referral to the Liver and Intestinal Organ Transplantation and Membership and Professional Standards Committees.

[No further changes to policy text.]

Committee Vote: 16 in favor, 0 opposed, 0 abstentions.

Analytical/Inferential Request #4

Comparison of MELD and PELD
Scores for Adolescent Patients

SRTR

SRTR Data Analysis of PELD/MELD for Adolescents

Pediatric Transplantation
Committee
January 31, 2003

SRTR

ustransplant.org
Scientific Registry of Transplant Recipients

Study Question

- Determine if it would be better for patients 12-17 to use PELD or MELD.
- Update including all patients except those status 1 adolescents who would also be status 1 as adults.
- Also examine tumor patients specifically.

SRTR

Methods (1)

- Patients ages 12-17 on the liver transplant waitlist at any time between 2/27/02 and 8/10/02.
- Status 1 adolescents who would be considered status 1 as adults were excluded.
- Patients classified by diagnosis (tumor patients vs non-tumor patients)

SRTR

Methods (2)

- Both a PELD and MELD score were calculated from laboratory values where the data were available.
- MELD could not be calculated for 132 patients (33.8%)
- MELD and PELD scores in this analysis do not take exceptions into account.
- Analyses done separately by diagnosis

SRTR

Liver Transplant Waitlist Patients (2/27/02-8/10/02) by Diagnosis

Primary Diagnosis

Malignant Neoplasm	
HCC	4
Other	2
Other Diagnosis	
All	390

SRTR

Lab MELD-PELD Category for Patients Aged 12-17 without Malignant Neoplasms

PELD Category	Missing	MELD Category			
		6-10	11-20	21-30	31-40
(-11)-(-1)	19	76	24	0	0
0-10	109	18	85	4	0
11-20	2	0	20	14	0
21-30	1	0	0	8	2
31-40	0	0	0	0	2

Average MELD= 13.4; Average PELD= 3.3

SRTR

Lab MELD-PELD Category for Patients Aged 12-17 with Malignant Neoplasms

PELD Category	Missing	MELD Category		
		6-10	11-20	21-40
(-11)-(-1)	0	3	1	0
0-10	1	0	1	0
11-20	0	0	0	0
21-51	0	0	0	0

Average MELD= 9.0; Average PELD= -3.3

SRTR

Summary Ages 12-17

- On average lab MELD scores were 3.8 points higher than the corresponding PELD scores for the malignant neoplasm patients and 5.1 points higher for the other patients. (A minimum PELD of 6 was used for this calculation in order to make the MELD and PELD scores more comparable.)
- Only 3 patients had lab PELD > lab MELD

SRTR

Summary

- For each group of patients in Table 2.2, 30 days outcomes reported in Table 1.1 (p. 237) can be compared to those in Table 2.4 to see whether the percent of patients transplanted within 30 days is better in the MELD or PELD category.
- This comparison should not be done for groups of tumor patients in Table 2.3 since patients are assigned by diagnosis in Table 2.3 and by exception code in Tables 1.1 and 2.4

SRTR

Conclusion

The higher lab MELD than PELD scores may suggest an advantage for ages 12-17 to be listed as MELD.

SRTR

Summary of Public Comments: Item #14

Proposed Modifications to OPTN/UNOS Policies 3.6 (Pediatric Donor Liver Allocation Algorithm & Allocation Sequence for Patients with PELD or MELD Scores Less than or Equal to 6 (All Donor Livers)), 3.6.4.2 (Pediatric Patients Status), 3.6.4.2.1 (Pediatric Patient Reassessment and Recertification Schedule), and 3.6.4.3 (Pediatric Liver Transplant Candidates with Metabolic Diseases), 3.6.4.4.1 (Pediatric Liver Transplant Candidates with Hepatoblastoma). (Liver and Intestinal Organ Transplantation

As of 4/29/2004, 89 responses have been submitted to UNOS regarding this policy proposal. Of these, 34 (38.20%) supported the proposal, 10 (11.24%) opposed the proposal, and 45 (50.56%) had no opinion. Of the 44 who responded with an opinion, 34 (77.27%) supported the proposal and 10 (22.73%) opposed the proposal. Comments on the proposal received to date are as follows:

I: Individuals Comments:

Comment 1:

vote: Oppose

This would not be fair & is fraught with the dangers of Transplant Facilities allocating available organs to this age group to bolster their Facility's "survival rates". It, also, seems to put a GREATER VALUE on their lives based solely on their youth.

Committee Response: No Committee response; the Committee did not understand how the comment related to the policy proposal.

Comment 2:

vote: Oppose

We oppose this because the current system is the most equitable for all liver candidates.

Committee Response: Based on the data provided to the Committee, the Committee feels that this will be more equitable than the present system.

Comment 3:

vote: Support

A major step forward on all fronts

Committee Response:

Comment 4:
vote: Support

Approve - no comments.

Committee Response:

Comment 5:
vote: Support

The donor pool should be increased for the pediatrics. The donors are typically not big enough for the age range of 12-17 y.o. This would allow small adult donors to be considered.

Committee Response:

March 2004

REGIONAL COMMENT SUMMARY

PROPOSAL 14: Proposed Modifications to OPTN/UNOS Policies 3.6 (Pediatric Donor Liver Allocation Algorithm & Allocation Sequence for Patients with PELD or MELD Scores Less than or Equal to 6 (All Donor Livers)), 3.6.4.2 (Pediatric Patients Status), 3.6.4.2.1 (Pediatric Patient Reassessment and Recertification Schedule), and 3.6.4.3 (Pediatric Liver Transplant Candidates with Metabolic Diseases), 3.6.4.4.1 (Pediatric Liver Transplant Candidates with Hepatoblastoma). (Liver and Intestinal Organ Transplantation Committee)

Sponsoring Committee: Liver and Intestinal Organ Transplantation Committee

Description: Under the proposed modifications, adolescent pediatric liver candidates (age 12-17) would be assigned a MELD score rather than a PELD score. For the majority of adolescent liver candidates, a calculated MELD score offers an increase in allocation score and, thus, an increase in opportunity for transplant. Based on the variables included in allocation score calculation in the MELD system, MELD scores may also offer a more accurate picture of mortality risk and disease severity for adolescent candidates. Adolescents will, however, maintain pediatric status in the policy, including assigned priority for children in the allocation of pediatric donor livers.

DATE THIS DOCUMENT MODIFIED: 5/3/04

Region	Meeting Date	Motion to Approve as Written	Approved as Amended (See Below)	Approved by Consensus	Did Not Consider
1	3/22/04	13 yes, 0 no, 0 no opinion			
2	5/07/04	23 yes, 1 no, 7 no opinion			
3	3/26/04	16 yes, 0 no, 1 no opinion			
4	4/2/04	30 yes, 0 no, 1 no opinion			
5	4/30/04	23 yes, 8 no, 4 no opinion, 1 no vote			
6	4/2/04	49 yes, 0 no, 4 no opinion			
7	4/23/04	18 yes, 0 no, 0 no opinion			
8	4/2/04	26 yes, 0 no, 1 no opinion			
9	4/21/04	17 yes, 0 no, 0 no opinion			
10	4/30/04	0 opinion			
11	3/26/04	18 yes, 0 no, 2 no opinion			

COMMENTS:

Analytical/Inferential Request #5

Determine the evolution of PELD scores. Follow pediatric patients waiting for a liver transplant and analyze the progression of their PELD scores.

Analytical Approach

The distribution of scores at the time of the next PELD update (7, 30, 90 or 365 days, according to the PELD-dependent applicable recertification schedule) were summarized by PELD range, as shown in the attached PowerPoint graphics, which were prepared for the December 8, 2003 MELD/PELD Conference.

Analytical/Inferential Request #6

The current allocation algorithm for pediatric livers allocates the liver (after Status 1) to pediatric patients On the OPO list with a score that correlates to above 50% 3-month pre-transplant mortality and then to adult above 50% mortality. Next the liver is offered to pediatric patients below 50% mortality risk then adults below 50% mortality risk. Model the effect of using an allocation algorithm that will allocate pediatric donor livers in the following manner (after Status 1):

Regionally to pediatric patients above a particular threshold (10, 20, 30, 40)

Locally to adult patients above 50% mortality

Regionally to pediatric patients below the above threshold (10, 20, 30, 40)

Adult patients below 50% mortality

Analysis Note:

Since the effect of altering the allocation system would lessen with increasing thresholds of risk, LSAM results will be provided using the thresholds of PELD=10 and PELD=20 only.

Study Population

Data from candidates on the liver waitlist and all donor organs that became available between 4/1/02 and 9/30/02 will be included in the simulation.

Analytical Approach

The previous analysis was revised to further examine the number of adolescent livers going to pediatric recipients using a score based system rather than the current percent mortality system using LSAM. Allocation rules that offer pediatric livers to pediatric candidates on the regional list above a threshold of PELD=10 and PELD=20 before offering them to adult candidates locally (Regional-Local), will be compared to the current OPO system as well as a previously tested system which offers pediatric organs above a threshold to pediatric candidates regionally before offering organs to adults regionally (Regional-Regional). These systems use the following allocation algorithms for pediatric organs after status 1:

Regional-Local

Pediatric Above Threshold (PELD=10,20) – Regional

Adult Above 50% risk of 3-month mortality (MELD=33) - Local

Pediatric Below Threshold (PELD=10,20) – Regional

Adult Above 50% risk of 3-month mortality (MELD=33) – Regional
 Adult Below 50% risk of 3-month mortality (MELD=33) – Local
 Adult Below 50% risk of 3-month mortality (MELD=33) – Regional
 Status 1 Pediatric – National
 Status 1 Adult - National
 Pediatric Above Threshold (PELD=10,20) – National
 Adult Above 50% risk of 3-month mortality (MELD=33) - National
 Pediatric Below Threshold (PELD=10,20) - National
 Adult Below 50% risk of 3-month mortality (MELD=33) - National

Regional-Regional

Pediatric Above Threshold (PELD=10,20) – Regional
 Adult Above 50% risk of 3-month mortality (MELD=33) - Regional
 Pediatric Below Threshold (PELD=10,20) – Regional
 Adult Below 50% risk of 3-month mortality (MELD=33) - Regional
 Status 1 Pediatric – National
 Status 1 Adult - National
 Pediatric Above Threshold (PELD=10,20) – National
 Adult Above 50% risk of 3-month mortality (MELD=33) - National
 Pediatric Below Threshold (PELD=10,20) - National
 Adult Below 50% risk of 3-month mortality (MELD=33) - National

To summarize: In the Regional-Local system pediatric candidates below the threshold are offered pediatric organs (regionally) before being offered (regionally) to adults above the threshold. In the Regional-Regional system pediatric organs are always allocated regionally to candidates above the threshold (pediatric then adult) before they are offered to candidates below the threshold (pediatric then adult).

Results

Table 1: Distribution of Liver Transplants by Recipient Age and Donor Age: Simulation of Current Allocation Rules using LSAM for 4/1/02-9/30/02 (n=2580)*

Recipient Age	Donor Age		
	<11	11-17	18+
<11	100 (3.9%)	26 (1.0%)	51 (2.0%)
11-17	17 (0.7%)	18 (0.7%)	33 (1.3%)
18+	62 (2.4%)	209 (8.1%)	2064 (80.0%)
Total (n=2580)	179 (7.0%)	253 (9.8%)	2148 (83.3%)

*Includes patients receiving 20 and 24 points for HCC

Table 2: Distribution of Liver Transplants by Recipient Age and Donor Age: **Regional – Regional** with PELD Threshold = 20 using LSAM for 4/1/02-9/30/02 (n=2578)*

Recipient Age	Donor Age		
	<11	11-17	18+
<11	102 (4.0%)	36 (1.4%)	50 (1.9%)
11-17	18 (0.7%)	26 (1.0%)	33 (1.3%)
18+	59 (2.3%)	191 (7.4%)	2063 (80.1%)
Total (n=2578)	179 (7.0%)	253 (9.8%)	2146 (83.3%)

*Includes patients receiving 20 and 24 points for HCC

Table 3: Distribution of Liver Transplants by Recipient Age and Donor Age: **Regional - Regional** with PELD Threshold = 10 using LSAM for 4/1/02-9/30/02 (n=2575)*

Recipient Age	Donor Age		
	<11	11-17	18+
<11	106 (4.1%)	34 (1.3%)	49 (1.9%)
11-17	18 (0.7%)	25 (1.0%)	33 (1.3%)
18+	54 (2.1%)	195 (7.6%)	2061 (80.0%)
Total (n=2575)	178 (6.9%)	254 (9.9%)	2143 (83.2%)

*Includes patients receiving 20 and 24 points for HCC

Table 4: Distribution of Liver Transplants by Recipient Age and Donor Age: **Regional - Local** with PELD Threshold = 20 using LSAM for 4/1/02-9/30/02 (n=2575)*

Recipient Age	Donor Age		
	<11	11-17	18+
<11	105 (4.1%)	36 (1.4%)	49 (1.9%)
11-17	18 (0.7%)	31 (1.2%)	32 (1.2%)
18+	56 (2.2%)	186 (7.2%)	2062 (80.1%)
Total (n=2575)	179 (7.0%)	253 (9.8%)	2143 (83.2%)

*Includes patients receiving 20 and 24 points for HCC

Table 5: Distribution of Liver Transplants by Recipient Age and Donor Age: **Regional - Local** with PELD Threshold = 10 using LSAM for 4/1/02-9/30/02 (n=2572)*

Recipient Age	Donor Age		
	<11	11-17	18+
<11	104 (4.1%)	35 (1.4%)	49 (1.9%)
11-17	18 (0.7%)	30 (1.2%)	32 (1.3%)
18+	55 (2.2%)	188 (7.3%)	2060 (80.0%)
Total (n=2572)	177 (6.9%)	253 (9.8%)	2141 (83.2%)

*Includes patients receiving 20 and 24 points for HCC

Figure 1. Distribution of Pediatric Livers going to Pediatric Patients with Different Thresholds of Risk: Using LSAM for 4/1/02-9/30/02

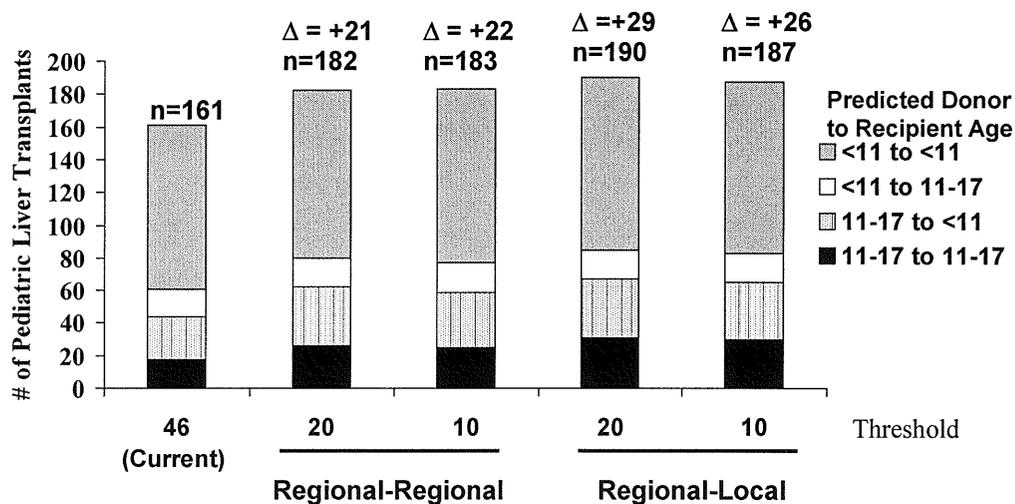


Table 6. Predicted Number of Waitlist and Post-Transplant Deaths with Different Thresholds of Risk: Using LSAM for 4/1/02-9/30/02

Time Period	46	Regional-Regional		Regional-Local	
	(Current)	20	10	20	10
Waitlist Deaths					
Pediatric	32	32	32	32	32
Adult	676	675	678	683	685
Deaths after Removal					
Pediatric	5	5	5	6	5
Adult	146	144	146	146	147
Post-Transplant Deaths					
Pediatric	27	28	30	27	28
Adult	204	197	204	209	204
Total Deaths					
Pediatric	64	65	67	64	64
Adult	1025	1016	1029	1038	1035
All	1089	1081	1096	1102	1099

Discussion

The Regional-Local allocation system would result in an increase in the number of pediatric donor livers transplanted in pediatric recipients as compared to both the current allocation system and the Regional-Regional allocation system. The number of deaths under the Regional-Local system is also predicted to increase compared to the current allocation system and the Regional-Regional system.

Briefing Paper Modifications to Policy 3.6.2.1 (Allocation of Blood Type O Donors).

Summary

This proposal, which was approved by the OPTN/UNOS Board of Directors for implementation concurrent with public comment, would increase the threshold for allocation of blood type O donors to blood type B candidates from a MELD/PELD score of 20 to a MELD/PELD score of 30. This is intended to better equalize the donor pool for O and B candidates. It was predicted to reduce the number of blood type O livers transplanted into blood type B patients and to increase the number of blood type O livers transplanted into blood type O recipients by the same number, without affecting the death rate in either population. This briefing paper summarizes the proposal that was circulated for public comment in March 2004, the Committee's responses to the public and regional comments received, and the Committee's final recommendation to the OPTN/UNOS Board of Directors.

Background

Prior to implementation of the MELD/PELD system in February 2002, Policy 3.6.2.1 (Allocation of Blood Type Donors) stated that "Blood type O livers shall not be transplanted into Status 2B or 3 candidates who are not a blood type O." The intent of this provision was to address disparities in transplantation rates and waiting list mortality between blood type O liver candidates and patients having other blood types. Upon implementation of the MELD/PELD system, the OPTN/UNOS Board of Directors approved a modification to Policy 3.6.2.1 that allowed blood type O donors to be offered to Blood type B patients whose MELD or PELD score is greater than or equal to 20. The intent of this change was to address concerns relating to very sick B patients, who may die prior to receiving a blood type B donor. At the time the MELD/PELD system implementation was being discussed, it was thought that a patient with a MELD score of 20 was approximately equivalent to a Status 2A.

In July 2003, the OPTN/UNOS Liver and Intestinal Transplantation Committee was asked to reevaluate Policy 3.6.2.2. The requestor stated in a letter that the policy disadvantages blood group O patients who must wait much longer for an organ. Rather than using waiting times as a basis for discussion, it was suggested that the mortality rates on the waiting list by blood group be examined. The first year of data indicated that the death rate was higher for blood group O versus other blood types, but this was not statistically significant. Further, experience with the MELD system indicates that the MELD score of 20 may not reflect the intended level of severity. A motion to increase the MELD/PELD threshold to 30 was made and seconded. However, it was noted that blood group O candidates, who on the whole wait longer and have higher mortality, do not have the same opportunity for an expansion of the donor pool as B candidates. One suggestion was to examine the proportion of O livers available for O patients versus the number of O plus B livers that are available for type B candidates, and determine how to make the pool equal for both groups. A MELD score could perhaps be determined that would allocate O livers to B patients only to extent that the donor pool is equalized. The Committee asked the SRTR to model the impact of changing the policy using various setpoints, including eliminating the priority for B candidates altogether, to determine at what point parity is achieved between the O and B candidates. The earlier motion was withdrawn.

During the October 2003 meeting, the SRTR reviewed an analysis that examined the use of different thresholds above which B candidates would be offered blood type O livers, including a scenario under which no blood type O livers would be offered to B candidates (Attachment 1). All waiting list candidates and donor organs available between April 1, 2002 and September 30, 2002, were included in the LSAM simulations. Thresholds of 20, 25 and 30 were examined. The number of waiting list and post transplant deaths for O and B candidates were compared under each scenario. The percentage of O livers allocated to B candidates ranged from 5.9% (current policy) to 0.0% (allocation not allowed); the percentage was 1.7 using a threshold of 30. Similarly, under the current policy, 20.8% of B recipients received O livers, which was reduced to 6.9% using a threshold of 30. The total number of deaths for both type B and O patients was relatively unchanged.

A Committee member remarked that the median waiting time to transplant in 1997 for blood group O patients, taken from the 2003 OPTN/SRTR Annual Report was 1,178 days, versus 510 days for blood group B patients, and questioned the fairness of this discrepancy. It was noted that both blood type O and B patients have a higher

mortality risk on the waiting list that types A and AB; this was considered when the current policy was formulated. A motion was made that the threshold should be raised to 30, which was predicted to reduce the number of O livers transplanted into B patients by almost 75% without affecting the death rate in either population.

Initial Policy Proposal

The following was submitted for consideration by the Board of Directors:

***** RESOLVED**, that Policy 3.6.2.1 (Allocation of Blood Type O Donors) shall be amended as follows, and implemented concurrent with public comment and upon completion of programming on the UNOS system:

3.6.2.1 Allocation of Blood Type O Donors. With the exception of Status 1 patients, blood type O donors may only be allocated to blood type O patients, or B patients with a MELD or PELD score greater than or equal to ~~20~~ 30.

Committee Vote: 18 in favor, 1 opposed, 4 abstentions.

This motion was approved by the Board of Directors in November 2003.

Review of Public and Regional Comments

As of April 29, 2004, 89 responses had been submitted to UNOS regarding this policy proposal. Of these, 38 (42.70%) supported the proposal, 11 (12.36%) opposed the proposal, and 40 (44.94%) had no opinion. Of the 49 who responded with an opinion, 38 (77.55%) supported the proposal and 11 (22.45%) opposed the proposal. The Committee responded to four comments submitted in opposition to the policy (Attachment 2). Ten Regions voted to support the proposal, with one in opposition. Region 2 did not support the policy because it was felt that the data did not indicate that doing so would benefit either group of patients. The vote in Region 3 was somewhat divided (11 in favor, 5 opposed, 1 no opinion) but no reason was provided for this. A programming specification document was also provide for the Committee's review.

Policy Proposal

Having reviewed the public comment, the Committee submits the following resolution for consideration by the Board of Directors:

***** RESOLVED**, that subsequent to consideration of the public comment, Policy 3.6.2.1 (Allocation of Blood Type O Donors) shall be amended as follows and implemented upon completion of programming in the UNOS system:

3.6.2.1 Allocation of Blood Type O Donors. With the exception of Status 1 patients, blood type O donors may only be allocated to blood type O patients, or B patients with a MELD or PELD score greater than or equal to ~~20~~ 30.

Committee vote: 15 in favor, 0 opposed, 0 abstentions.

Analytical/Inferential Request #2

Using LSAM, model several MELD/PELD point thresholds above which B candidates enter the pool along with O candidates to receive an offer for an O liver. At what MELD score threshold would B candidates and O candidates receive comparable benefits? Also model a scenario in which B candidates are never offered an O liver.

SRTR

Methods

- Data from candidates on the liver waitlist and all donor organs that became available between 4/1/02 and 9/30/02 were used in the simulations
- Multiple MELD/PELD thresholds were tested by varying the allocation rules in LSAM
- The number of O livers allocated to B candidates and the number of deaths among O and B patients for the simulation runs were compared

SRTR

LSAM Results by Blood Group

Threshold for Sharing	20	25	30	Never
# O Livers to B candidates	62	32	18	0
% of O Livers to B candidates	5.9%	3.0%	1.7%	0.0%
% of B Recipients Receiving an O Liver	20.8%	11.8%	6.9%	0.0%
Total B Deaths	116	113	116	123
Total O Deaths	503	502	503	500
Total O & B Deaths	619	615	619	623

SRTR

Conclusions

- Increasing the threshold for the point at which O livers are shared with B candidates would have a relatively large impact on the number of livers shared, but have little effect on the total number of deaths

SRTR

Summary of Public Comments: Item #9

Proposed Modifications to OPTN/UNOS Policy 3.6.2.1 (Allocation of Blood Type O Donors) (Liver and Intestinal Organ Transplantation Committee)

As of 4/29/2004, 89 responses have been submitted to UNOS regarding this policy proposal. Of these, 38 (42.70%) supported the proposal, 11 (12.36%) opposed the proposal, and 40 (44.94%) had no opinion. Of the 49 who responded with an opinion, 38 (77.55%) supported the proposal and 11 (22.45%) opposed the proposal. Comments on the proposal received to date are as follows:

I: Individuals Comments:

Comment 1:

vote: Oppose

Conclusions made here are based past on mortality data and do not take into consideration past difficulty for minorities to be listed for a liver transplant. Models indicate this change will affect neither the number of B nor O deaths but decreases the percentage of B transplants by a factor of 4.

Committee Response: This proposal does not address listing practices. The modeling of this proposal was shown to have a modest difference on number the deaths.

Comment 2:

vote: Oppose

I am adamantly opposed to proposal number 9. Blood group B donors are so rare that the only way B recipients get livers is to get sick enough to score a MELD of 20 and then have access to O livers. Your own data shows that only 5.9% of O livers are given to B recipients. By raising the MELD threshold for sharing to 30, most of the 20.8% of B recipients currently receiving O livers will die before being transplanted. In addition, the mortality rate for liver transplants soars for MELD scores above 30, so the system will promote the transplantation of individuals who have a poorer chance of survival.

Committee Response: Patients with blood group B have not been shown to have poorer outcomes than other individuals. However, the OPTN/UNOS The Minority Affairs Committee has requested an analysis of these data stratified by Ethnicity, and these data will be reviewed..

Comment 3:

vote: Oppose

I STRONGLY oppose this proposal. As we are all aware, blood type B donors are so rare that the only way B recipients get livers is to get sick enough to score a MELD of 20 and then have access to O livers. The data shows that only 5.9% of O livers are given to B recipients. By raising the threshold to MELD of 30, most of the B recipients, who currently receive O livers would die before being transplanted.

Committee Response: Please see responses to comment #2.

Comment 4:

vote: Oppose

This is essentially an unethical proposal. it so disadvantages and discriminates against the Blood Group Type B patient, that these patients will virtually be given a death sentence should this proposal be adopted. It will be impossible to get livers for these before they all die!

Committee Response: This proposal will be evaluated to determine its impacts. also see response to comment #1.

Comment 5:

vote: Support

30 seems too high. Something between 25-30 seem more appropriate.

Committee Response: No response.

Comment 6:

vote: Support

Approve - no comments.

Committee Response:

Comment 7:

vote: Support

Prior to crossing blood groups, all efforts should be made to place the organ within the same ABO.

Committee Response:

Comment 8:

vote: Support

Strongly support measures that reduce the inequality experienced by O candidates.

Committee Response:

March 2004

REGIONAL COMMENT SUMMARY

**PROPOSAL 9: Proposed Modifications to OPTN/UNOS Policy 3.6.2.1 (Allocation of Blood Type O Donors)
(Liver and Intestinal Organ Transplantation Committee)**

Sponsoring Committee: Liver and Intestinal Organ Transplantation Committee

Description: This proposal, which was approved by the OPTN/UNOS Board of Directors for implementation concurrent with public comment, would increase the threshold for allocation of blood type O donors to blood type B candidates from a MELD/PELD score of 20 to a MELD/PELD score of 30. This is intended to better equalize the donor pool for O and B candidates. It was predicted to reduce the number of blood type O livers transplanted into blood type B patients and to increase the number of blood type O livers transplanted into blood type O recipients by the same number, without affecting the death rate in either population.

DATE THIS DOCUMENT MODIFIED: 5/3/04

Region	Meeting Date	Motion to Approve as Written	Approved as Amended (See Below)	Approved by Consensus	Did Not Consider
1	3/22/04	13 yes, 0 no, 0 no opinion			
2	5/07/04	8 yes, 17 no, 6 no opinion			
3	3/26/04	11 yes, 5 no, 1 no opinion			
4	4/2/04	23 yes, 0 no, 2 no opinion			
5	4/30/04	32 yes, 2 no, 2 no opinion			
6	4/2/04	47 yes, 0 no, 6 no opinion			
7	4/23/04	18 yes, 0 no, 0 no opinion			
8	4/2/04	25 yes, 0 no, 1 no opinion			
9	4/21/04	16 yes, 0 no, 2 no opinion			
10	4/30/04	19 yes, 0 no, 0 no opinion			
11	3/26/04	20 yes, 0 no, 0 no opinion			

COMMENTS:

Region 2- The Region was opposed to this policy because the data did not indicate that doing so would benefit either group of patients. In fact, the data shows no change in the death rate for candidates in either blood group if the threshold is increased to a MELD/PELD score of 30.

Briefing Paper Proposed Modifications to Policy 3.6.2.1 1 (Allocation of Blood Type O Donors).

Summary

This proposal would allow any remaining blood type compatible candidates to appear on the match run list for blood type O donors after the blood type O and B candidate list has been exhausted at the regional and national level. Under current policy, these patients do not appear on the match run and are therefore not eligible for organ offers. This may reduce organ wastage in some instances. This briefing paper summarizes the proposal that was circulated for public comment in March 2004, the Committee's responses to the public and regional comments received, and the Committee's final recommendation to the OPTN/UNOS Board of Directors.

Background

Under the current policy, blood type B candidates who are not Status 1 and whose MELD/PELD scores are below 20 do not appear on the match run for blood type O donors and are therefore not eligible for these liver offers; similarly blood type A and AB candidates who are not Status 1 do not appear on the match run for blood type O donors. OPTN/UNOS Policy 3.2.3 (Match System Access) stipulates that organs can only be allocated to patients who appear on a match run. This issue was brought to the attention of the OPTN/UNOS Liver and Intestinal Organ Transplantation Committee in October 2003. One cited disadvantage of the current policy is that a blood type O liver can be sent out of the Region to be transplanted in a blood type O patient elsewhere even if there are patients of compatible blood type in the OPO or Region with much higher MELD scores. Instances of organ wastage as result of the policy were also cited. The match run algorithm could be changed to allow non-blood type O patients to appear on the match run at some level in order to avoid organ wastage, perhaps after the regional or national level. While this would not prevent a type O donor to leave a Region to be transplanted in a low-MELD score type O patient while there may be more urgent non-O patients in the Region, it would allow all patients to appear on the match run and be eligible for offers. The Committee was reminded of the higher death rates in O and B patients versus A and AB patients. In cases when prolonged ischemia time is a factor, local non-O patients could receive an offer for an O donor. The Committee felt that organs should never be wasted as a result of an OPTN/UNOS policy.

Initial Policy Proposal

After discussion, the Liver and Intestinal Organ Transplantation Committee approved the following resolution:

RESOLVED, that in order to avoid organ wastage, after the O and B candidate list has been exhausted at the Regional and National level, blood type A and AB candidates should be allowed to appear on the match run list. This proposal will be circulated for public comment.

3.6.2.1 Allocation of Blood Type O Donors. With the Exception of Status 1 patients, blood type O donors may only be allocated to blood type O patients, or B patients with a MELD or PELD score greater than or equal to 20. Any remaining blood type compatible candidates will appear on the match run list for blood type O donors after the blood type O and B candidate list has been exhausted at the regional and national level.

Review of Public and Regional Comments

As of April 29, 2004, 90 responses had been submitted to UNOS regarding this policy proposal. Of these, 46 (51.11%) supported the proposal, 2 (2.22%) opposed the proposal, and 42 (46.67%) had no opinion. Of the 48 who responded with an opinion, 46 (95.83%) supported the proposal and 2 (4.17%) opposed the proposal.). All of the Regions supported the proposal. The Committee responded to comments submitted in opposition to the policy (Attachment 1). A programming specification document was also provide for the Committee's review.

Policy Proposal

Having reviewed the public and regional comments, the Committee submits the following resolution for consideration by the Board of Directors:

*** **RESOLVED, that subsequent to consideration of the public comment, Policy 3.6.2.1 (Allocation of Blood Type O Donors) shall be amended as follows and implemented upon completion of programming in the UNOS system:**

3.6.2.1 Allocation of Blood Type O Donors. With the Exception of Status 1 patients, blood type O donors may only be allocated to blood type O patients, or B patients with a MELD or PELD score greater than or equal to ≥ 30 . Any remaining blood type compatible candidates will appear on the match run list for blood type O donors after the blood type O and B candidate list has been exhausted at the regional and national level.

Committee Vote: 17 in favor, 0 opposed, 0 abstentions.

Summary of Public Comments: Item #10

Proposed Modifications to OPTN/UNOS Policy 3.6.2.1 (Allocation of Blood Type O Donors). (Liver and Intestinal Organ Transplantation Committee)

As of 4/29/2004, 90 responses have been submitted to UNOS regarding this policy proposal. Of these, 46 (51.11%) supported the proposal, 2 (2.22%) opposed the proposal, and 42 (46.67%) had no opinion. Of the 48 who responded with an opinion, 46 (95.83%) supported the proposal and 2 (4.17%) opposed the proposal. Comments on the proposal received to date are as follows:

I: Individuals Comments:

Comment 1:

vote: Oppose

It's inconceivable that the National List will be exhausted. Concept is a good one, however, there will be placement issues if the national level is included.

Committee Response: This circumstance has arisen in the past.

Comment 2:

vote: Support

Approve - no comments.

Committee Response:

Comment 3:

vote: Support

Strongly support measures that reduce the inequality experienced by O candidates.

Committee Response:

Comment 4:

vote: No Opinion

Good idea just not as written.

Committee Response:

March 2004

REGIONAL COMMENT SUMMARY

PROPOSAL 10: Proposed Modifications to OPTN/UNOS Policy 3.6.2.1 (Allocation of Blood Type O Donors) (Liver and Intestinal Organ Transplantation Committee)

Sponsoring Committee: Liver and Intestinal Organ Transplantation Committee

Description: This proposal would allow any remaining blood type compatible candidates to appear on the match run list for blood type O donors after the blood type O and B candidate list has been exhausted at the regional and national level. Under current policy, these patients do not appear on the match run and are therefore not eligible for organ offers. This may reduce organ wastage in some instances.

DATE THIS DOCUMENT MODIFIED: 5/3/04

Region	Meeting Date	Motion to Approve as Written	Approved as Amended (See Below)	Approved by Consensus	Did Not Consider
1	3/22/04	12 yes, 0 no, 1 no opinion			
2	5/07/04	28 yes, 0 no, 3 no opinion			
3	3/26/04	17 yes, 0 no, 0 no opinion			
4	4/2/04	24 yes, 0 no, 3 no opinion			
5	4/30/04	34 yes, 0 no, 2 no opinion			
6	4/2/04	49 yes, 0 no, 4 no opinion			
7	4/23/04	17 yes, 1 no, 0 no opinion			
8	4/2/04	25 yes, 0 no, 1 no opinion			
9	4/21/04	16 yes, 0 no, 1 no opinion			
10	4/30/04	19 yes, 0 no, 0 no opinion			
11	3/26/04	20 yes, 0 no, 0 no opinion			

COMMENTS:

Briefing Paper

Proposed Modifications to Policy 3.6.4.4.1 (Adult Patient Reassessment and Recertification Schedule) and 3.6.4.2.1 (Pediatric Patient Reassessment and Recertification Schedule).

Summary

This proposal, which was approved by the OPTN/UNOS Board of Directors for implementation concurrent with public comment, specifies that patients whose MELD/PELD scores remain uncertified will be reassigned to a MELD/PELD score of 6. Pediatric patients whose uncertified score is less than 6 would remain at that lower, uncertified PELD score. Under the current policy, some patients who are uncertified are allowed to remain indefinitely at an uncertified MELD/PELD score. This briefing paper summarizes the proposal that was circulated for public comment in March 2004, the Committee's responses to the public and regional comments received, and the Committee's final recommendation to the OPTN/UNOS Board of Directors.

Background

Policies 3.6.4.4.1 (Adult Patient Reassessment and Recertification Schedule) and 3.6.4.2.1 (Pediatric Patient Reassessment and Recertification Schedule) are intended to ensure that patients are listed at the appropriate MELD and PELD score. These policies require that patients whose laboratory values are not updated in accordance with the recertification schedule are reassigned to their previous lower MELD/PELD score; those patients with no prior MELD/PELD score are downgraded to a score of 6. There is no provision in the programming to lower the scores further if the patient remains uncertified at a previously held lower score. In practice, a patient with several high laboratory MELD/PELD scores in succession could "drop" to a relatively high MELD/PELD score, and is allowed to remain at that uncertified score indefinitely. This was brought to the attention of the OPTN/UNOS Liver and Intestinal Organ Transplantation Committee in July 2003. A second related item identified by the UNOS Policy Compliance staff was the fact that Policy states that pediatric patients who are uncertified with no previous lower PELD score "shall be reassigned to a PELD score of 6." In many cases, the effect of this is to raise, rather than lower, the patient's PELD score. The Committee discussed potential solutions to both issues during the July 2003 meeting. A tabulation of the number of patients waiting at uncertified scores was provided to the Committee. An analysis of organ offer data revealed 92 instances in which a patient received an offer at an uncertified score through July 7, 2003. In 75 cases, the MELD score at removal was higher than the uncertified score. The Committee felt that, while the number of instances thus far has been small, this was a loophole that needed to be closed.

The Committee agreed that patients with uncertified MELD/PELD score should be reassigned to the previous lower score, and if the patient remains uncertified, to be downgraded to a score of 6. In these cases, pediatric patients would be downgraded to a 6, but if the uncertified score was lower than a 6 they would remain at that score. The Committee approved the following resolution:

RESOLVED, that a patient whose MELD/PELD score has not been updated in accordance with the Recertification and Reassessment schedule will be re-assigned to the previous lower laboratory score at the first episode of non-certification. If the patient remains uncertified past the period defined by the recertification schedule for the uncertified score, the patient will be assigned a MELD score of 6. Pediatric patients who are not certified will be assigned a PELD score of 6, or will remain at their current (uncertified) PELD score if it is less than 6.

Vote: 19 in favor, 0 opposed, 0 abstentions.

During the October 2003 Committee meeting, the Committee decided that patients who are uncertified at the time the policy is implemented should be assigned a score of 6 at that time. The Committee discussed the impact of setting the schedule for downgrading based on the candidate's current uncertified laboratory score. For example, if the patient's uncertified laboratory MELD score is 25, the patient would remain at that score for a week (in accordance with the recertification and reassessment schedule) after the recertification was due, and would then be

downgraded to a 6, whereas a patient whose uncertified laboratory score was 18 would remain at the previous lower score for a month prior to downgrade. If there is no previous lower score then the candidate would be downgraded to a score of 6 after the initial recertification period has elapsed. One Committee member expressed concern that patients with higher scores are given a shorter “grace period” before being downgraded to a 6 than patients with lower scores. However, the system was designed to ensure that patients at higher scores, who are more likely to receive an offer, must recertify more frequently.

A Committee member suggested the following example as a potential approach for handling instances of uncertified scores. If a patient is listed with a MELD score of 18 and subsequently has a MELD score of 25 that is not recertified, the patient would be reassigned to an 18 rather than remaining as a 25, and would be allowed to keep the MELD score of 18 for the time allowed at that score (i.e., one month) minus the time spent at the higher score before being downgraded to a MELD score of 6. The fact that the patient had a laboratory score of greater than an 18 (i.e., the score of 25) during that time period would imply that the patient would have qualified for an 18 and the associated one month recertification period. This does not address the case of patients with no prior MELD/PELD score. The Committee opined that a patient with no prior score whose laboratory values are not recertified in accordance with the schedule would be reassigned to a 6. Members reiterated that centers need to recertify their patients, especially at the higher scores. The Committee discussed the possibility of assigning a specific period of time during which the patient may remain uncertified without being downgraded to a 6, ranging from one week to one month. Ultimately, the Committee approved the following motion:

RESOLVED, that when a patient has an uncertified lab score, the patient should be downgraded to the previous MELD/PELD score for the period of time allowed under the recertification schedule for that score minus the time the patient was listed at the higher score. If there is no remaining balance of time, then the patient will be assigned a MELD/PELD score of 6.

Committee Vote 16 in favor, 6 opposed, 1 abstention.

Based on these two resolutions, the Committee circulated a proposal for public consideration in March 2004.

Review of Public and Regional Comments

As of April 29, 2004, 89 responses had been submitted to UNOS regarding this policy proposal. Of these, 39 (43.82%) supported the proposal, 0 (0%) opposed the proposal, and 50 (56.18%) had no opinion. Of the 39 who responded with an opinion, 39 (100.00%) supported the proposal and 0 (0%) opposed the proposal. All of the Regions supported the proposal. No public comments were submitted in opposition to the policy, although 2 Regions proposed modifications that were not accepted by the Committee (Attachment 1). A programming specification document was also provided for the Committee’s review.

Policy Proposal

Having reviewed the public and regional comments, the Committee submits the following resolution for consideration by the Board of Directors:

*** **RESOLVED, that Policy 3.6.4.4.1 (Adult Patient Reassessment and Recertification Schedule) and 3.6.4.2.1 (Pediatric Patient Reassessment and Recertification Schedule) shall be amended as follows and implemented upon completion of programming in the UNOS system:**

3.6.4.1.1 Adult Patient Reassessment and Recertification Schedule. The appropriateness of the MELD score assigned to each patient listing shall be re-assessed and recertified by the listing transplant center to UNOS in accordance with the following schedule:

Adult Patient Reassessment and Recertification Schedule

Status 1	Status recertification every 7 days.	Laboratory values must be no older than 48 hours.
MELD Score 25 or greater	Status recertification every 7 days.	Laboratory values must be no older than 48 hours.
Score <= 24 but > 18	Status recertification every 1 month.	Laboratory values must be no older than 7 days.
Score <= 18 but >=11	Status recertification every 3 months.	Laboratory values must be no older than 14 days.
Score <= 10 but > 0	Status recertification every 12 months.	Laboratory values must be no older than 30 days.

This reassessment and recertification must be based on the most recent clinical information (e.g., laboratory test results and diagnosis), including the dates of the laboratory tests. In order to recertify, laboratory values must not be older than the "age of laboratory values" specified in the chart above. In order to change a MELD score voluntarily, all laboratory values must be obtained on the same day. UNOS shall notify the listing transplant center of the need to reassess and recertify a patient's MELD score within 48 hours of the applicable deadline indicated in the recertification schedule. If a patient is not recertified in accordance with the schedule, the patient shall be re-assigned to their previous lower MELD score. The patient may remain at that previous lower score for the period allowed based upon the recertification schedule for the previous lower score, minus the time spent in the uncertified score. If the patient remains uncertified past the recertification due date for the previous lower score, the patient will be assigned a MELD score of 6. If a patient has no previous lower MELD score, and is not recertified in accordance with the schedule, the patient shall be reassigned to a MELD score of 6.

3.6.4.2.1 Pediatric Patient Reassessment and Recertification Schedule. The appropriateness of the PELD score assigned to each patient listing shall be re-assessed and recertified by the listing transplant center to UNOS in accordance with the following schedule:

Pediatric Patient Reassessment and Recertification Schedule

Status 1	Status recertification every 7 days.	Laboratory values must be no older than 48 hours.
PELD Score 25 or greater	Status recertification every 14 days.	Laboratory values must be no older than 72 hours.
Score < =24 but > 18	Status recertification every 1 month.	Laboratory values must be no older than 7 days.
Score <= 18 but >=11	Status recertification every 3 months.	Laboratory values must be no older than 14 days.
Score <= 10	Status recertification every 12 months.	Laboratory values must be no older than 30 days.

This reassessment and recertification must be based on the most recent clinical information (e.g., laboratory test results and diagnosis) including the dates of the laboratory tests. In order to recertify, laboratory values must not be older than the "age of laboratory values" specified in the chart above. In order to change a PELD score voluntarily, all laboratory values must be obtained on the same day. UNOS shall notify the listing transplant center of the need to reassess and recertify a patient's PELD score within 48 hours of the applicable deadline indicated in the recertification schedule. If a patient is not recertified in accordance with the schedule, the patient shall be re-assigned to their previous lower PELD score. The patient may remain at that previous lower score for the period allowed based upon the recertification schedule for the previous lower score, minus the time spent in the uncertified score. If the patient remains uncertified past the recertification due date for the previous lower score, the patient will be assigned a PELD score of 6. If a patient has no previous lower PELD score, and is not recertified in accordance with the

schedule, the patient shall be reassigned to a PELD score of 6, or will remain at the uncertified PELD score if it is less than 6.

Committee Vote: 18 in favor, 0 opposed, 0 abstentions.

Summary of Public Comments: Item #11

Proposed Modifications to OPTN/UNOS Policy 3.6.4.4.1 (Adult Patient Reassessment and Recertification Schedule) and 3.6.4.2.1 (Pediatric Patient Reassessment and Recertification Schedule). (Liver and Intestinal Organ Transplantation Committee)

As of 4/29/2004, 89 responses have been submitted to UNOS regarding this policy proposal. Of these, 39 (43.82%) supported the proposal, 0 (0%) opposed the proposal, and 50 (56.18%) had no opinion. Of the 39 who responded with an opinion, 39 (100.00%) supported the proposal and 0 (0%) opposed the proposal. Comments on the proposal received to date are as follows:

I: Individuals Comments:

Comment 1:

vote: Support

Approve - no comments.

Committee Response:

Comment 2:

vote: Support

There should be added, a "grace period" of several days for patients that have followed the Reassessment & Recertification Schedule, but have somehow, not had their labs REPORTED to their Transplant Facility(s) due to local Laboratory error. I, personally, have been dropped to the "default" score & left there for WEEKS, unknowingly, prior to my Nurse Coordinator notifying me that my score had been dropped to default (via US Postal). During those weeks, I could have been called to receive an organ, had I not been dropped to default. I had completed MY PART, however, the healthcare providers were, obviously, not doing THEIRS. I support the Proposal, in the case of "noncompliant patients" being dropped to default, however, that is not the case in my situation and I've been dropped 2 to 3 times now for weeks!

Committee Response:

REGIONAL COMMENT SUMMARY

PROPOSAL 11: Proposed Modifications to OPTN/UNOS Policy 3.6.4.4.1 (Adult Patient Reassessment and Recertification Schedule) and 3.6.4.2.1 (Pediatric Patient Reassessment and Recertification Schedule). (Liver and Intestinal Organ Transplantation Committee)

Sponsoring Committee: Liver and Intestinal Organ Transplantation Committee

Description: This proposal, which was approved by the OPTN/UNOS Board of Directors for implementation concurrent with public comment, specifies that patients whose MELD/PELD scores remain uncertified will be reassigned to a MELD/PELD score of 6. Pediatric patients whose uncertified score is less than 6 would remain at that lower, uncertified PELD score. Under the current policy, some patients who are uncertified are allowed to remain indefinitely at an uncertified MELD/PELD score.

DATE THIS DOCUMENT MODIFIED: 5/3/04

Region	Meeting Date	Motion to Approve as Written	Approved as Amended (See Below)	Approved by Consensus	Did Not Consider
1	3/22/04	12 yes, 0 no, 0 no opinion			
2	5/07/04		26 yes, 0 no, 5 no opinion		
3	3/26/04	15 yes, 0 no, 2 no opinion			
4	4/2/04	31 yes, 0 no, 1 no opinion			
5	4/30/04	34 yes, 0 no, 2 no opinion			
6	4/2/04	48 yes, 0 no, 5 no opinion			
7	4/23/04	15 yes, 0 no, 1 no opinion			
8	4/2/04		21 yes, 1 no, 2 no opinion		
9	4/21/04	15 yes, 0 no, 3 no opinion			
10	4/30/04	3 yes, 0 no, 1 no opinion			
11	3/26/04	19 yes, 0 no, 1 no opinion			

COMMENTS:

Region 2: The region approved the proposal with the following modification:

Patients who have been listed with both a MELD and a PELD score, will drop to the higher of the two previous scores.

Region 8: The region approved with the requirement that there be a three day grace period provision prior to the patient being downgraded to a MELD/PELD of 6.

Briefing Paper Modifications to the Region 5 Status 1 Sharing Agreement

Summary

The proposed changes to the Region 5 Status 1 sharing agreement would eliminate the provision for payback for Status 1 shares. The definition of Status 1 for both adult and pediatric candidates will be redefined to better identify patients in urgent need of a liver. These changes are recommended by the OPTN/UNOS Liver and Intestinal Organ Transplantation Committee, having been charged by the Board of Directors to adjudicate the issue. This briefing paper summarizes the proposal that was circulated for public comment in March 2004, the Committee's responses to the public and regional comments received, and the Committee's final recommendation to the OPTN/UNOS Board of Directors.

Background

In June 1999, the UNOS Board of Directors approved a modification to the liver allocation policy that would allocate deceased donor livers first to Status 1 patients in the local area, then to Status 1 patients on the regional list. The intent of this policy change was to broaden the donor pool for the most urgent patients. At the time, the Committee emphasized that this proposal is offered as a minimum policy for liver distribution in the United States. In areas of the country where there are existing, or proposed arrangements for regionwide liver sharing to Status 1 candidates, the Committee stated that these regional distribution systems should continue. In approving this policy, the Board also approved a recommendation that UNOS assist Regions in developing Status 1 liver sharing arrangements and directed the UNOS Liver and Intestinal Organ Transplantation Committee to a.) explore the experience of other UNOS Regions with such arrangements that have been proven to be effective; and b.) assist Regions in developing systems tailored to regional experience and concerns.

At its July 20, 1999 meeting, the Committee discussed the time frame for implementation of the modified liver allocation policy and its applicability to UNOS Regions that do not have existing Status 1 liver sharing arrangements. Pursuant to the Board's directive, the Committee supported the following position, which was approved by the Board of Directors:

Resolved, that the amended language of UNOS Policy 3.6, which specifies regional liver sharing for Status 1 patients, shall be implemented no later than September 1, 1999. The liver transplant programs and OPOs in Regions 2, 3, 5, 6 and 7 shall be notified of this policy's implementation and encouraged to initiate a dialogue on establishing alternative regional liver sharing arrangements for Status 1 patients that are tailored to regional experience and concerns. To facilitate this dialogue, descriptions of the Status 1 sharing arrangements currently implemented in Regions 1, 4, 8, 9, 10 and 11, and any information on the experience of these arrangements shall be provided.

Initial Sharing Agreement

Until the fall of 2000, the Region allocated livers in accordance with the national policy, with no sharing agreement in place. During that time the Region experienced internal difficulties, with discussions of dividing the Region. Further complicating matter, the state of Arizona had passed a statute in 1999 requiring a "reciprocal agreement" for sharing organs outside the state. In October 2000, the Region 5 membership approved a sharing agreement under which liver would be offered first to local Status 1 patients, followed by regional Status 1 candidates, in accordance with the national policy. A share of a liver for a non-local Status 1 candidate would incur a 'payback,' which would be suspended if there is a Status 2A (now MELD/PELD of 25) in the local OPO. The agreement also included a provision for review of the impact of the agreement after one year and each year thereafter. Of the 26 participating members, 21, or eighty percent, were in support of the Sharing Agreement/Variance. This was approved by the Executive Committee of the UNOS Board of Directors in January 2001 and implemented on May 23, 2001.

This proposal was modified in 2002 to incorporate the MELD/PELD system. A timeline of events related to the agreement is contained in Attachment 1.

Proposed Modifications: January 2003

In January 2003, the OPTN/UNOS Liver and Intestinal Organ Transplantation Committee received requests from several transplant programs in Region 5 to suspend the Region 5 Status 1 Sharing agreement until the arrangement could be reviewed with respect to the impact of this sharing agreement on the equitable organ allocation to patients within the region. At issue was whether the payback provision was impeding sharing for urgent patients. John P. Roberts, M.D., from the University of California in San Francisco, presented the viewpoint of these centers to the Committee. Dr. Roberts reviewed the proposed modifications to the provisions of the sharing agreement, which were voted on by the Region and implemented with less than 100% of the centers in favor. Under the agreement, the payback is suspended if there is a patient in the OPO with a MELD/PELD of 25 or greater, unless the OPO has a debt of more than three livers. There is also a payback limit of 3, such that centers with an accumulated credit of 3 livers do not have to share for Status 1 patients. Dr. Roberts asserted that this system encouraged OPOs to share 3 livers and then refuse subsequent paybacks so that they are no longer required to share. The payback system was not on-line at the time, so the accounting had not been systematic. Dr. Roberts presented data that showed the most of the Status 1 sharing occurred between northern and southern California, with little sharing within the rest of the Region. Dr. Roberts made the following recommendations:

- If a center turns down 3 Status 1 offers (by blood type) for livers that are subsequently transplanted elsewhere, their credit limit should be reduced by 1.
- More data elements should be used to evaluate the system.
- The payback system must go on-line in order monitor the sharing agreement.

It was reported that that the payback system had been programmed and scheduled to go on-line in March 2003. One OPO had not been submitting its paperwork to UNOS so that their accounting was not final. David Mulligan, MD, the Region 5 Representative to the Liver Committee, was hopeful that the Region could develop a proposal that could be presented to the Committee in May, complete with a programming specification document. In support of this, the Committee unanimously approved a motion that Region 5 should come to the Committee in May with a proposal, and that if the Region is unable to resolve their differences then the Liver Committee would resolve the issue.

Review of Progress: May 2003

During the May 2003 meeting, Dr. Mulligan reviewed the Region's efforts to develop a revised sharing agreement that would address the disparities in mean MELD score at transplant between the OPOs in the Region. The Region was working to determine if a compromise could be agreed to that would equitably distribute organs according to patient need without harming the smaller programs in the Region. As discussed in January, the primary issue of concern was the payback provision. Some large centers felt that smaller centers were "cherry picking" the payback offers, meaning the centers would accept only pristine payback offers. Also noted was the likelihood that organs were being sent out of area for patients who where perhaps not as sick as those in the procuring area. One other concern was that one center in the Region was reported to have a rate of primary non-function (PNF) and early hepatic artery thrombosis (HAT), and was attracting Status 1 shares from other areas that had a much lower retransplant rate.

Dr. Mulligan reported that a new proposal had been drafted that was, at the time, supported by 50% of the members of the Region with one modification. A provision that would have excluded primary non-function and hepatic artery thrombosis from the Status 1 Regional share was found to be too controversial to be addressed at this time. Under the revised agreement, a center that accrued a debt as a result of importing a Status 1 share must offer a payback to the OPO with the highest credit balance (of at least 3 credits) of identical blood group. In order to be eligible for the payback, the MELD score at transplant in the OPO must be greater than or equal to the mean MELD score at transplant of the procuring (debtor) OPO. The calculation of the mean MELD score at transplant would be based on a 6 month rolling average for each OPO, by blood group. The payback would not be required until the OPO owed four or more debts.

If an OPO refused a transplantable liver offered as a payback more than two times, the OPOs credit balance will be reduced by one credit; this was added to address concerns of “cherry picking.” A “transplantable” liver was defined as one that was still functioning after 7 days post-transplant. Each debt or credit would remain for one year and then cleared. Dr. Mulligan expressed concern that the proposal had reached only 50% agreement. Regional members had been meeting weekly to arrive at the current compromise proposal. There was disagreement among some of the centers as to what constitutes a MELD score that is too sick to transplant in light of a system that offers organs based on the highest MELD score. At the larger centers, patients must progress to higher MELD scores in order to receive an offer, while some centers (e.g., a small center in a single-center OPO) are able to transplant patients at lower MELD scores before their disease progresses. The intent of the proposal was to balance out these needs in light of a scarce resource. There are currently small centers that are able to exist within the same OPO with large centers. Data provided to the Committee indicated that the difference between the mean MELD at listing and the mean MELD at transplant was much higher in some of the OPOs in Region 5 than others. Committee members theorized that, if centers cannot transplant at low MELD scores, over time the MELD scores for patients at those centers would increase.

The Committee discussed replacing the proposed rolling average for the mean MELD at transplant by blood group for each OPO with a fixed score (e.g., a MELD score of 25). Ultimately, the Committee agreed to approve the proposal that the Region 5 programs had worked to design, and submits the following resolution for consideration by the Board of Directors:

** RESOLVED, that the Region 5 Sharing Agreement, amended as described above, shall be approved and implemented upon completion of programming in the UNOS system. The Sharing Agreement will be evaluated in 6 months to determine if further modifications are necessary.

Committee Vote: 9 on favor, 3 opposed, 4 abstentions.

The Liver Committee recognized that the proposal did not have 75% approval of the Regional members, but approved it in an effort to maintain some form of regional sharing for Status 1 patients in Region 5.

Board of Directors Involvement, June 2003

During the June 2003 Board of Directors meeting, the OPTN/UNOS Board of Directors considered the Region 5 Status 1 Sharing Agreement and resolved that “...in the interest of the best care that patients can receive in Region 5, the Board of Directors supports the concept of using the MELD/PELD score to define when a payback can occur, and that a declined organ that is used for transplant can “wipe out” a payback. The Region 5 sharing agreement will be considered at the November 2003 Board of Directors meeting and any sharing agreement receiving less than 75% approval from the Region will be circulated for public comment.”

Committee Consideration, October 2003

The Committee reviewed the progress of the agreement during the October 2003 meeting. John McVicar, M.D., Region 5 Councillor to the Board, provided a history of the Region 5 sharing agreement. Dr. McVicar reported that, during the time livers were shared for Status 1s without a payback (prior to the sharing agreement), there were imbalances in sharing between OPOs in the Region. The imposition of a payback in 2001 reduced these imbalances. The presentation included three observations: 1) pediatric patients are responsible for the increased number of Status 1 transplants; 2) some centers have a higher PNF/HAT rate than the rest of the region; and 3) there are more Status 1 patients listed and transplanted in two OPOs in Region 5. Of the Status 1 transplants in Region 5, more than half are pediatric patients. For the first half of 2003, 81% of pediatric transplant recipients in Region 5 were Status 1 patients, versus 48% nationally. Approximately half of the pediatric Status 1 listings did not meet the standard Status 1 criteria. The center with the highest rate of listing patients for PNF also had the highest rate of transplanting those patients. Dr. McVicar addressed several of the complaints made at the January meeting. The largest obstacle to the sharing agreement involves the provision for payback, as half of the Regional members desire a payback and half are opposed. Dr. McVicar outlined a compromise proposal, which included a

provision that paybacks would only occur for high MELD patients.

Dr. Mulligan agreed that one concern with the payback provision in the current agreement is that it allows livers to be sent for payback to low-MELD patients when there are sick patients in the local area. This could be rectified in part by restructuring the Status 1 definition. Steven D. Colquhoun, M.D., Region 5 Representative, expressed optimism that the proposal that had been circulated could be approved by 75% of the Region. The Region had been developing a redefinition of Status 1, specifically for PNF and HAT. The pediatric issues would be addressed later. With the redefinition in place, the payback provision would be removed. The Committee did not choose to intervene at this time, in order to allow the Region to vote on the current proposal and resolve the issue. A Subcommittee was appointed to review the Region 5 issues and relevant data and report to the Committee at the next meeting. This was not addressed during the November, 2003 Board of Directors meeting; however, the Executive Committee reiterated that the Liver Committee should adjudicate the issue.

Region 5 Subcommittee

The Region 5 subcommittee met via teleconference several times in January 2003. C. Wright Pinson, MD, Chair of the full Committee, had charged the subcommittee with providing a recommendation or set of options that would address the problems with Region 5's Status 1 sharing agreement. A packet of information, including a timeline of events, all proposals circulated to the Region, and the data reviewed by the Region 5 membership in their assessment of the sharing agreement was provided to the subcommittee.

The group discussed the reasons why earlier proposals had not been accepted by the Region. One major point of contention has been the issue of paybacks for Status 1 shares. The statute in place in Arizona, if interpreted strictly, would necessitate some form of a payback to be in place to fulfill the requirement for a "reciprocal agreement." Subcommittee members agreed that it would be helpful to review the Arizona law and to obtain a legal interpretation of that statute, as this has been cited as an obstacle to several proposed changes to the sharing agreement. The sharing agreements in place in other Regions were also provided to the subcommittee. It was stated that, in Region 2, a payback is generated for an adult Status 1 share only if the patient is listed for primary graft non-function (PNF). This could be applied in Region 5 as a way to reduce the number of paybacks, while addressing concerns related to the aggressive use of extended donors leading to high rates of PNF. A second issue of contention in Region 5 is the high number of pediatric patients who are listed in Status 1. In Region 5, standard Status 1 cases are not reviewed by the RRB. This was done at the request of the Region 5 membership, due to the large caseload of Status 1 reviews; only cases not meeting the standard criteria for Status 1 are reviewed. In light of this, the subcommittee discussed a possible recommendation that all Status 1 extensions must be reviewed in Region 5, perhaps prospectively. It has been reported that there are pediatric patients who remain in Status 1 well beyond 7 days.

Subcommittee members discussed the issue of payback organs that are refused by one center but are subsequently transplanted successfully by another center. There had been a suggestion during the Regional discussions that this should eliminate a credit on the part of the center that originally declined the organ. "Successful" could be defined as still functioning at some defined period (e.g. 30 days) post-transplant. This would help to allay concerns that centers are "cherry picking" payback offers, and repeatedly declining offers such that the accumulated credits are never reduced. The reduction of a credit was not seen as penalizing patients, although one subcommittee member suggested that the offer should be made prior to cross-clamp in order for the turndown to generate a cancelled credit. The subcommittee discussed whether there should be a cap on paybacks; it was felt that if the other major concerns of the Region could be addressed then a cap would not be necessary.

February 2004 Committee Meeting

After much deliberation, the subcommittee made the following recommendations to the full Committee during the February 5, 2004 meeting:

1. Eliminate all paybacks except as noted below.
2. Pediatric Status 1 with Chronic Disease:
 - a) If on waiting list greater than 2 weeks, mandated prospective review and approval by region 5 Regional Review Board for continued Status 1 designation.
 - b) If remains as Status 1 more than two weeks, a payback debt is generated when child is transplanted.
3. Primary Non-Function:
 - a) A payback debt is generated when a mandatory share liver is used to retransplant a patient for the diagnosis of Primary Non-Function.
4. Paybacks for above situations:
 - a) Fall after Status 1 offers in the allocation algorithm.
 - b) Are OPO to OPO.
 - c) Debtee OPO has three offers to cancel a debt by accepting a payback liver. If after third offer a liver is not accepted the debt is cancelled. Appeal of appropriateness of offers are to Region 5 Regional Review Board.
 - d) Donor Network of Arizona is a full participant in this modified agreement.

The agreement would also include yearly review of debts by OPO, PNF rates by center, Status 1 listing by center, acute retransplant rate by center, death on waitlist by center, and MELD at transplant by center, to be carried out by Liver and Intestinal Organ Transplantation Committee.

During the February 2004 meeting, several representatives from transplant programs and OPOs in the Region were present or participated via teleconference. In addition to five Committee members from Region 5, six individuals representing three OPOs and three transplant centers were present or on the telephone. Each individual was given an opportunity to present their views of the sharing agreement. Their presentations can be summarized as follows:

- One speaker stated that the proposed modifications (elimination of payback) would negatively impact patients in their community-based OPO.
- In large centers, organs are being exported for payback into patients with low MELD scores when there are sicker patients within the exporting OPO. The PNF numbers vary depending on the window of time being examined. The Committee examined the PNF issue previously, and the speakers' center does not have a higher rate of PNF than other centers in the US. The Committee should encourage the use of expanded donors. Redefining Status 1 for pediatric patients and PNF criteria for adults will eliminate the need for paybacks.
- The view of one OPO was that the payback system has primarily caused Northern California to make paybacks to Southern California and vice versus, adding cold ischemia time to livers. The frequency of Status 1 has been fairly evenly distributed between San Diego, Northern California, Southern California and Arizona. The OPO argued against paybacks, but, if required, emphasized that the sickest patients should be transplanted first.
- If the payback stays in place, there should be a MELD requirement of the receiving OPO to make sure that the payback goes to sick patients. Having said that, the Status 1 livers that are being sent out of OPOs for non life-threatening problems in the immediate 7 days is a problem. One way of adopting other rules may be that a subset of those Status 1 (i.e., pediatrics with chronic liver disease) may not be eligible for regional sharing. This would lower the number of paybacks. The speaker favored elimination of paybacks with the caveat that the definition of Status 1 needs to be tightened up (HAT, PNF) to define those patients that are sick and those that are not.
- When the definition of Status 1 changed in 1997, the incidence of Status 1 transplants in 1998-1999 in Region 5 decreased dramatically. The percentage of pediatric Status 1 transplants has grown since that time. With the shortage of livers, any inducement for raising someone's status on the waiting list is going to be fully utilized by every transplant center that is caring for patients. In Region 5, there is a disparity between OPOs in the incidence of status 1 transplants. For the first 11 months of 2003,

between 15 and 25% liver transplanted in Region 5 are for Status 1 patients; the national average is 10%. For adults, it is 10.4 in Region 5 versus 6.1, for pediatric patients: 70% pediatric recipients are transplanted in Status 1 in Region 5. The PNF rates are approximately 6% throughout Region 5; one center with large numbers of transplants averaged about 10% and because of their large numbers and the power associated with that it is significantly different from the rest of the region. Clinically, they are similar.

One assertion has been that the payback system was resulting in higher patients deaths. The data show that there is no difference in death rate between patients in large OPOs in Region 5 and the rest of the country, when comparing the year before and the year after the agreement. The assertion that centers are cherry picking paybacks was not supported by the data. The real issue is payback, with about half wanting payback. A compromise proposal that was circulated previously was shown to the Committee for their consideration.

- Arizona participates under the current system and is a net exporter to Status 1 patients. The Arizona law requires a reciprocal agreement. There should be some criteria for the payback offers.

Dr. Mulligan presented a proposal that he, along with Drs. Colquhoun and Gish, were sponsoring (Attachment 2). This proposal would eliminate paybacks, and would redefine Status 1 for adults and pediatric patients. Dr. Gish made a presentation in support of the concepts in the proposal (Attachment 3). The Committee had earlier approved a proposal put forward by Dr. McDiarmid on behalf of the Pediatric Transplantation Committee to revise the Status 1 definition for pediatric patients. This redefinition of Status 1 had been incorporated in their proposal, and is provided in Table 1.

Table 1: Proposed Redefinition for Pediatric Status 1 for Region 5

<p>A pediatric patient listed as Status 1 is located in the hospital's Intensive Care Unit (ICU). There are four allowable diagnostic groups (i) fulminant liver failure (ii) primary non function (iii) hepatic artery thrombosis and (iv) chronic liver disease. Within each diagnostic group specific conditions must be met to allow for listing a pediatric patient at status 1 without prospective Regional Review Board approval.</p> <ul style="list-style-type: none"> (i) Fulminant hepatic failure. Fulminant liver failure is defined as the onset of hepatic encephalopathy within 8 weeks of the first symptoms of liver disease. The absence of pre-existing liver disease is critical to the diagnosis. One of three criteria below must be met to list a pediatric patient in the ICU with fulminant liver failure: (1) ventilator dependence (2) requiring dialysis or continuous veno-venous hemofiltration (CVVH) or continuous veno-venous hemodialysis (CVVD) (3) INR > 3.0 and Glasgow coma score < 10. (ii) Primary non-function of a transplanted liver. The diagnosis is made within 7 days of implantation. Additional criteria to be met for this indication must include 2 of the following: ALT > 2000, INR > 3.0 or total bilirubin > 10 mg/dl (iii) Hepatic artery thrombosis. The diagnosis must be made in a transplanted liver within 14 days of implantation. (iv) Acute decompensated Wilson's disease. (v) Chronic liver disease. Pediatric patients with chronic liver disease and in the ICU can be listed at status 1 if one of the following criteria is met: <ul style="list-style-type: none"> (1) On a mechanical ventilator (2) Have a PELD score of >25 or MELD score of >25 for adolescent candidates (12-17 years) and gastrointestinal bleeding requiring at least 30 cc/kg of red blood cell replacement within

the previous 24 hours

- (3) Have a PELD score of >25 or MELD score of >25 for adolescent candidates (12-17 years), and (i) renal failure or (ii) renal insufficiency.
- (4) Have a PELD >25 or MELD score of >25 for adolescent candidates (12-17 years) and a Glasgow coma score < 10

Dr. Levy responded to the comments made by the region. Due to lack of trust in the region, either PNF and/or Status 1 for chronic pediatrics must be redefined, or there would have to be some form of payback, with a clause that would prevent “cherrypicking.” The Committee reviewed the proposed redefinition for adult Status 1, which was reported to be supported within Region 5. With these new definitions for Status 1, Dr. Levy felt that there would not need to be a payback.

The Committee discussed the proposed criteria for adult Status 1 for PNF presented by Dr. Gish. These were derived from an analysis of predictors of primary non-function using the Liver Transplantation database. Committee members suggested that, to avoid manipulation, all labs must be from some blood draw within 24 hours to 7 days following the transplant. This would technically restrict Status 1 listings to 1 day post-transplant. Centers would be audited for compliance with this policy. Members also suggested that the time frame for HAT be lowered to 7 days. The committee discussed the impact of requiring the AST to be greater than 5000 and either an INR of 2.5 or lactic acidosis, and whether there would be cases when the AST was at one point higher than 5000 but the INR was lower than 2.5, and subsequently the INR begins to rise as the AST is lowering. These cases could be reviewed by the RRB. The revised definition of Status 1 for adults is shown in Table 2.

Table 2: Proposed Redefinition of Adult Status 1 for Region 5

- A. Acute liver failure
- B. Primary non-function ≤ 10 days as defined by:
 1. AST ≥ 5000 and one or both of the following:
 - 2A. INR ≥ 3.0
 - 2B. Acidosis: pH ≤ 7.3 and/or Lactate $\geq 2x$ normal
 3. Anhepatic patient (stands alone)
- C. HAT ≤ 7 days as defined by PNF above; HAT not meeting PNF criteria will be listed at a MELD of 40 to confine such patients to the local OPO and avoid affecting the entire region (does not apply to living donor or split organs)
- D. Acute Wilson’s Disease

The Committee had already discussed the proposed modification to Status 1 proposed by the Pediatric Committee. The revised criteria were approved by the Committee for inclusion in the national policy with slight modification, although the Committee agreed not to move forward with the proposal until other pediatric issues (i.e., the pediatric donor allocation sequence) could be revised in parallel. It was suggested that the redefined adult Status 1 could be used in Region 5 as a pilot for the US. This may not accrue enough data for statistical research regarding the effectiveness of the revised criteria, but could provide useful information as to whether the definitions will improve the problems in Region 5 and elsewhere as measured by the outcome measures identified (% Status 1s, PNF rates, etc.).

After these discussions, a proposal including the following provisions were put to a vote:

- Tighter definitions for Status 1
- Eliminate paybacks
- Require retrospective review of all Status 1 listings

- For PNF, require that labs be drawn at 24 hours to 7 days post-transplant, all from the same draw; alter the INR requirement to 3 to be consistent with the pediatric proposal.
- Evaluate the sharing agreement in 6 months and 1 year after implementation.

Committee Vote: 20 in favor, 0 opposed, 0 abstentions.

(Committee members representing Region 5 were not included in the final discussion and vote)

Review of Public and Regional Comments

As of April 29, 2004, 89 responses had been submitted to UNOS regarding this policy proposal. Of these, 22 (24.72%) supported the proposal, 8 (8.99%) opposed the proposal, and 59 (66.29%) had no opinion. Of the 30 who responded with an opinion, 22 (73.33%) supported the proposal and 8 (26.67%) opposed the proposal. Ten Regions voted in favor of the policy (one as amended by the Region), with one opposed. The Committee responded to comments submitted in opposition to the policy (Attachment 4). A programming specification document was also provide for the Committee's review.

Region 8 voiced concerns that by approving this motion it would serve as a precedent for the Liver/Intestine Committee to dictate regional sharing agreements. The Committee responded that Region 5 has not been able to reach consensus on this issue. The Liver Committee and the Board have repeatedly tried to obtain consensus in Region 5; the Committee's intervention was seen as a last resort. Region 5 asked that the definition of HAT be extended to 10 days; this was accepted by the Committee. The region also voted to keep the payback provision for six months, by a vote of 16 in favor and 12 opposed. It was reported that this motion was introduced to the Region 5 meeting after many of the attendees had left and may not be representative. The Committee did not support the request, noting that the policy will be evaluated at six months. Existing paybacks at the time the agreement is implemented will be paid back until the debts are zeroed out. The Committee felt that the revised definition of pediatric Status 1 should apply to the Region 5 sharing agreement. The regional representatives were in agreement with this decision.

Policy Proposal

The Committee submits the following for consideration by the Board of Directors:

***** RESOLVED, that subsequent to consideration of the public comment, the Region 5 sharing agreement shall be amended as follows and implemented upon completion of programming in the UNOS system:**

Region 5 Status 1 Sharing Agreement

- The Agreement will use the revised definitions for Status 1 as described in Tables 1 and 2
- Paybacks will be eliminated
- There will be retrospective review of all Status 1 listings
- The sharing agreement will be evaluated at 6 months and 1 year after implementation.

Table 1. Redefinition for Pediatric Status 1 for Region 5

A pediatric patient listed as Status 1A or 1B is located in the hospital's Intensive Care Unit (ICU). There are four allowable diagnostic groups (i) fulminant liver failure (ii) primary non function (iii) hepatic artery thrombosis and (iv) chronic liver disease. Within each diagnostic group specific conditions must be met to allow for listing a pediatric patient at status 1A or 1B without prospective Regional Review Board approval.

Status 1A

- (i) Fulminant hepatic failure. Fulminant liver failure is defined as the onset of hepatic encephalopathy within 8 weeks of the first symptoms of liver disease. The absence of pre-existing liver disease is critical to the diagnosis. One of three criteria below must be met to list a pediatric patient in the ICU with fulminant liver failure: (1) ventilator dependence (2) requiring dialysis or continuous veno-venous hemofiltration (CVVH) or continuous veno-venous hemodialysis (CVVD) (3) INR > 3.0 ~~2.0~~ and Glasgow coma score < 10.
- (ii) Primary non-function of a transplanted liver. The diagnosis is made within 7 days of implantation. Additional criteria to be met for this indication must include 2 of the following: ALT > 2000, INR > 3.0 or total bilirubin > 10 mg/dl
- (iii) Hepatic artery thrombosis. The diagnosis must be made in a transplanted liver within 14 days of implantation.
- (vi) Acute decompensated Wilson's disease.

Status 1B **

(↔) Chronic liver disease. Pediatric patients with chronic liver disease and in the ICU can be listed at status 1B if one of the following criteria is met:

- (1) On a mechanical ventilator
- (2) Have a PELD score of >25 or MELD score of >25 for adolescent candidates (12-17 years) and gastrointestinal bleeding requiring at least 30 cc/kg of red blood cell replacement within the previous 24 hours
- (3) Have a PELD score of >25 or MELD score of >25 for adolescent candidates (12-17 years), and (i) renal failure defined as dialysis, CVVH or CVVD ~~or (ii) renal insufficiency.~~
- (4) Have a PELD >25 or MELD score of >25 for adolescent candidates (12-17 years) and a Glasgow coma score < 10

** Other pediatric patients that may qualify for Status 1 in Policies 3.6.4.2, 3.6.4.3, and 3.6.4.4.1 (i.e., metabolic diseases such as OTC and Crigler-Najjar Disease Type I, and hepatoblastoma) may apply for Status 1B.

Table 2. Redefinition of Adult Status 1 for Region 5

- A. Acute liver failure
- B. Primary non-function ≤ 10 days as defined by:
 - 1. AST ≥ 5000 and one or both of the following:
 - 2A. INR ≥ 3.0
 - 2B. Acidosis: pH ≤ 7.3 and/or Lactate $\geq 2x$ normal
 - 3. Anhepatic patient (stands alone)

For PNF, labs must be drawn at 24 hours to 7 days post-transplant, all from the same draw

- C. HAT ≤ 7 10 days as defined by PNF above; HAT not meeting PNF criteria will be listed at a MELD of 40 to confine such patients to the local OPO and avoid affecting the entire region (does not apply to living donor or split organs)
- D. Acute Wilson's Disease

Committee Vote: 16 in favor, 0 opposed, 4 abstentions.

TIMELINE OF ACTIVITY RELATED TO THE REGION 5 LIVER SHARING AGREEMENT

- October 6, 2000- The Region 5 Liver Sharing Agreement (Exhibit A) was approved at the Region 5 meeting by a vote of 28 in favor, 8 opposed. A subsequent ballot was sent to the Liver programs and OPOs in Region 5. Of the 26 participating members, 21, or eighty percent, were in support of the Sharing Agreement/Variance.
- January 16, 2001-The Executive Committee of the UNOS Board of Directors approved the Region 5 Sharing Agreement/Variance for Status 1 Livers. The Agreement was implemented on May 23, 2001.
- February 2002- The Agreement was modified to replace Status 2A with MELD/PELD score of ≥ 25 . (Exhibit B)
- January 16, 2003- During a conference call meeting of the Region 5 Liver Program Directors and OPO Executive Directors, a Data Subcommittee was formed to determine what data was needed for the Members to study the impact of the Sharing Agreement on the liver candidates in Region 5. This subcommittee met several times and agreed upon a list of data that would be needed to review the Agreement (Exhibit C).
- January 27, 2003- John Roberts, MD, outlined his concerns with the Region 5 sharing agreement in a presentation to the OPTN/UNOS Liver and Intestinal Transplantation Committee (Exhibit D). The Committee unanimously approved a motion that Region 5 should provide the Committee with a proposal in May, and that if the Region was unable to resolve their differences then the Liver Committee would resolve the issue.
- March 2003- Several Members in the Region requested to dissolve the current Sharing Agreement. This proposal was circulated to Region 5 Membership. The proposal did not reach 75% support; the vote was 10 in favor, 11 opposed and 3 no response (Exhibit E).
- May 2, 2003- The Region 5 Liver Program Directors met in conjunction with the UNOS Region 5 Meeting and reviewed the data compiled by the Data Sub-Committee. David Mulligan, MD, Region 5 Representative to the OPTN/UNOS Liver and Intestine Transplantation Committee, developed a modified sharing agreement based on suggestions and comments from the May 2 meeting. This proposal (Exhibit F) was circulated on May 8, 2003 to the Region 5 Membership. The agreement did not reach 75% approval; the vote was 12 in favor, 10 opposed, 2 no response.
- June 2003-Many of the members who did not support the May 8 proposal provided comments (Exhibit G). John McVicar, MD, incorporated some of the suggestions provided in those comments into a modified proposal (Exhibit H) that was circulated on June 20, 2003 to the Region 5 Membership. The agreement did not reach 75% approval; the vote was 9 in favor, 9 opposed, 1 no vote and 5 no response (Exhibit I).
- June 2003- The OPTN/UNOS Board of Directors considered the Region 5 Status 1 Sharing Agreement and resolved that "...in the interest of the best care that patients can receive in Region 5. the Board of Directors supports the concept of using the MELD/PELD score to define when a payback can occur, and that a declined organ that is used for transplant can "wipe out" a payback. The Region 5 sharing agreement will be considered at the November 2003 Board of Directors meeting and any sharing agreement receiving less than 75% approval from the Region will be circulated for public comment."

- September 5, 2003-The Region 5 Liver Program Directors met in conjunction with the UNOS Regional Meeting. At that time the group discussed updated data (Exhibit J) and possible modifications to the Sharing Agreement. Based on feedback from the September 5 meeting along with one-on-one conversations with every Liver Program and OPO in Region 5, Steven Colquhoun, MD, Region 5 Representative to the OPTN/UNOS Liver and Intestine Transplantation Committee, worked to develop a modified sharing agreement (Exhibit K).
- October 2003-The OPTN/UNOS Liver and Intestinal Organ Transplantation Committee discussed the status of the sharing agreement. At the time, the Region was still in the process of negotiating modifications to the agreement. In an effort to give the Liver Programs and OPOs in Region 5 every opportunity to develop a proposal that would be supported by at least 75% of the participating members, the Committee agreed to delay further consideration until the latest proposal could be circulated to the Region 5 membership. In addition, the Committee appointed a Region 5 Sub-Committee to review the current Region 5 Liver Sharing Agreement in the event that the Region was not successful in getting the needed support. This Committee will review the data and draft a modified proposal that will be submitted to the full Committee at the February meeting. Dr. McVicar presented a history of the sharing agreement to the Committee (Exhibit L).
- October 2003-The proposal drafted by Dr. Colquhoun was circulated to the Region 5 Membership. The agreement did not reach 75% approval; the vote was 14 in favor and 12 opposed (Exhibit M).
- November 19, 2003-The outcome of this effort was reported to the OPTN/UNOS Executive Committee of the Board during its November 19, 2003 meeting. The Executive Committee resolved that the OPTN/UNOS Liver and Intestinal Organ Transplantation Committee will review the history and data related to the Region 5 sharing agreement, and the underlying reasons behind the Region's inability to reach a consensus at its February 2004 meeting. There will be opportunity for regional liver transplant program and OPO sharing agreement participants to present their data and viewpoints during this meeting.

February 2004

Russell Wiesner
President, OPTN/UNOS Board of Directors

C. Wright Pinson
Chair, Liver/Intestine Transplantation Committee

John R. Lake
Vice Chair, Liver/Intestine Transplantation Committee

Re: Region 5 Sharing for Status 1 Pediatric & Adult patients

Drs Wiesner, Pinson and Lake,

Regional sharing of deceased donor livers for status 1 transplant recipients is vital to insure the equal access of organs to patients in need, regardless of their location. However, within the immense geographic boundaries of region 5, is an equally immense diversity in both philosophy and practice of recipient and donor organ selection. There are also significant differences between OPO's in the average MELD scores of listed patients. Finally, the often-considerable distances between transplant centers can add issues of organ quality versus time and expense. Collectively, these facts have led to occasional animosity between various programs within our region. Accurate real-time, center-specific data regarding regional transplant activity can be difficult or even inappropriate to acquire, which can further increase suspicions. Indeed, the central issue in region 5 appears to be as much a problem of *perception* as that of reality. The solution adopted by the Liver/Intestine Transplantation Committee should acknowledge this fact.

At the root of the problem is a general observation that the volume of status 1 activity in region 5 is greater than initially anticipated. In both the pediatric and adult realms, the meaning of status 1 has appeared to have been diluted from the spirit of its original intent i.e., patients in the most desperate circumstance, with only hours or days to survive. Most, if not all, in region 5 agree that the existing criteria for determining status 1 listing are too inclusive. We submit that the lasting solution to Region 5 sharing lies in policy changes that address these perceptions of inappropriate status 1 listings, rather than reliance on any type of payback system. Indeed, even though the current payback system was devised to alleviate such problems, in its present state, many would now agree that it has compounded them.

In any form, payback systems may all be inherently flawed, in that they exist primarily to serve physicians and transplant centers as opposed to patients. In every system proposed thus far, there are caps in place that limit the obligation of an OPO until payback organs are received. In *theory*, if the caps in such a system have been met, a status 1 patient could go without a critically needed organ, while elsewhere in the region a lower MELD patient received a transplant. More realistically, on the other hand, an organ used to pay back a prior debt, could move away from an OPO with high MELD patients to be placed in a relatively low MELD individual within another OPO. Such circumstances would most certainly fail the test of public scrutiny, and could conceivably lead to severe criticism in the media or worse.

A system that allows organs to move only to recipients with an equal or higher MELD score also appears to be imperfect. Due to nearly constant numbers of patients with maximum MELD scores, the OPO's servicing major population areas in region 5 would rarely, if ever, payback organs.

Finally, a system has been proposed to "dis-incentivize" the use of high-risk organs by invoking a payback only in the circumstance of a status 1 for PNF. Unfortunately this fails to acknowledge the fact that, with few exceptions, all OPO's in region 5 service multiple transplant centers. Since paybacks are the obligation of the OPO and not a single center, the "dis-incentive" is misdirected to all centers within an OPO, rather than only the "offending" center. Such a system would further increase, rather than decrease, animosity between programs.

We propose that the following few, but substantial, modifications should be adopted as variances to UNOS policy in region 5. Since the majority of the status 1 listings in region 5 are for pediatric patients, Dr McDiarmid has proposed significant changes to the PELD criteria defining status 1 which should be adopted as written. These changes limit the listing of children with chronic liver disease (attachment A).

For adult patients we propose a definition of PNF that will be based on previously agreed upon clinical parameters. This should reduce the possibility of invoking a PNF diagnosis inappropriately. Next we propose removing HAT from the status 1 criteria, and alternatively assigning those patients with 40 MELD points. Patients with HAT that meet PNF criteria would be listed as status 1, whereas the remainder would become a local rather than a regional burden (attachment B). With these modifications and a lower volume of status 1 patients, ongoing oversight by the regional review board should be feasible. This alone should further diminish mistrust between programs.

In light of their flaws and potential for liability, we propose that strong consideration be given to the complete removal of any payback system. This would also eliminate the ongoing concerns over the "cherry picking" of organs, the complexity and errors that have occurred between OPO's, and the reality that organs procured and used locally fare better than those transported long distances.

Hopefully with these changes in place, we can better and more fairly serve patients, while also reducing the *perceptions* that appear to underlie much of the problem in region 5.

Respectively submitted,

Steven D. Colquhoun

Handwritten signature of Robert G. Gish in black ink.

Robert G. Gish

David C. Mulligan

A Draft Proposal for Modifying the Definition for Status 1 in Children Awaiting Liver Transplantation. Jan 21,2004

Sue McDiarmid MD

This is intended to start the discussion. New language is in bold type. I have tried to choose criteria that are objective, verifiable and make clinical sense. There is not much published data to guide us. To ensure compliance with appropriate status 1 listing clearly objective verifiable data are necessary. However, an important advantage is that if we were to adopt some of these criteria we would establish a dataset which would allow us to test predictive abilities of the criteria and better understand how the severity of illness at transplant affects post transplant outcome in (truly) very sick children awaiting liver transplant.

Current UNOS Policy 3.6.4.2 (Relevant Excerpts)

A pediatric patient listed as Status 1 is located in the hospital's Intensive Care Unit (ICU). ~~due to acute or chronic liver failure, has a life expectancy without a liver transplant of less than 7 days and meets at least 1 of the following criteria:~~ **There are four allowable diagnostic groups (1) fulminant liver failure (2) primary non function (3) hepatic artery thrombosis and (4) chronic liver disease. Within each diagnostic group specific conditions must be met to allow for listing a pediatric patient at status 1 without prospective Regional Review Board approval.**

- (a) **Fulminant hepatic failure.** Fulminant liver failure is defined as the onset of hepatic encephalopathy within 8 weeks of the first symptoms of liver disease. The absence of pre-existing liver disease is critical to the diagnosis. ~~While no single clinical observation or laboratory test defines fulminant hepatic failure, the diagnosis is based on the finding of stage II encephalopathy (i.e., drowsiness, inappropriate behavior, incontinence with asterixis) in a patient with severe liver dysfunction. Evidence of severe liver dysfunction may be manifest by some or all of the following symptoms and signs: asterixis (flapping tremor), hyperbilirubinemia (i.e., bilirubin >15mg%), marked prolongation of the INR (i.e., >2.5), or hypoglycemia. One of three criteria below must be met to list a pediatric patient in the ICU with fulminant liver failure:~~ **(1) ventilator dependence (2) requiring dialysis or continuous veno-venous hemofiltration (CVVH) or continuous veno-venous hemodialysis (CVVD) (3) INR \geq 3.0 and Glasgow coma score \leq 10.[P1]**
- (ii) **Primary non-function of a transplanted liver. The diagnosis is made within 7 days of implantation. Additional criteria to be met for this indication must include 2 of the following: ALT \geq 2000, INR \geq 3.0 or total bilirubin \geq 10 mg/dl**

(iii) **Hepatic artery thrombosis. The diagnosis must be made in a transplanted liver within 7 14 days of implantation. Additional criteria to be met for this indication must include 2 of the following: ALT \geq 2000, INR \geq 3.0 or total bilirubin \geq 10 mg/dl**

~~(iv) Acute decompensated Wilson's disease.~~

~~(i) On mechanical ventilator.~~

(ii) **Chronic liver disease. Pediatric patients with chronic liver and in the ICU can be listed at status 1 if one of the following criteria :**

a. On a mechanical ventilator

b. Have a PELD score of >25 and gastrointestinal bleeding requiring at least 30 cc/kg of red blood cell replacement within the previous 24 hours

c. Have a PELD score of >25 and renal failure requiring dialysis or CVVH or CVVD

~~(iv) Upper gastro-intestinal bleeding requiring at least 10 cc/kg of red blood cell replacement which continues or recurs despite treatment.~~

~~(iii) Hepatorenal syndrome: The presence of progressive deterioration of renal function in a patient with advanced liver disease requiring hospitalization for management, with no other known etiology of renal insufficiency, and a rising serum creatinine 3 times baseline. In addition to these major criteria, the patient should meet at least one of the following: a) urine volume $<$ 10 ml/kg/d; b) urine sodium $<$ 10 mEq/l; or c) urine osmolality $>$ plasma osmolality (U/P ratio $>$ 1.0).~~

(4) Have a PELD \geq 25 and a Glasgow coma score $<$ 8

~~(viii) Stage III or IV encephalopathy unresponsive to medical therapy.~~

~~(ix) Refractory Ascites/Hepato-Hydrothorax: Severe persistent ascites or hepatohydrothorax, defined as any one of the following: unresponsive to diuretic and salt restriction therapy leading to respiratory distress, or requiring supplemental tube feeding, or requiring parenteral nutrition, or requiring supplemental oxygen, or requiring paracentesis.~~

~~(x) Biliary sepsis requiring pressor support of 5 [P2]mcg/kg/min of dopamine or greater.~~

With the exception of hospitalized pediatric liver transplant candidates with ~~Ornithine Transcarbamylase Deficiency (OTC)~~ **urea cycle defects** or Crigler-Najjar Disease Type I, patients who are listed as a Status 1 automatically revert back to their most recent PELD score after 7 days unless these

patients are relisted as Status 1 by an attending physician. Patients must be listed with PELD laboratory values in accordance with Policy 3.6.4.2.1 (Pediatric Patient Recertification and Reassessment Schedule) at the time of listing. A patient listed as Status 1 shall be reviewed by the applicable UNOS Regional Review Board. A completed Liver Status 1 Justification Form must be received by UNOS on UNetsm for a patient's original listing as a Status 1 and each relisting as a Status 1. If a completed Liver Status 1 Justification Form is not entered into UNetsm when a candidate is registered as a Status 1, the candidate shall be reassigned to their most recent PELD score. A relisting request to continue a Status 1 listing for the same patient waiting on that specific transplant beyond 14 days accumulated time will result in a review of all local Status 1 liver patient listings.

All other pediatric liver transplant candidates on the UNOS Patient Waiting List shall be assigned a mortality risk score calculated in accordance with the PELD scoring system.. For each liver candidate registration, the listing transplant center shall enter data on the UNOS computer system for the prognostic factors specified in Table 2. These data must be based on the most recent clinical information (e.g., laboratory test results and diagnosis) and include the dates of the laboratory tests.

3.6.4.3 Pediatric Liver Transplant Candidates with Metabolic Diseases (e.g., OTC or Crigler-Najjar Disease Type I): A pediatric liver transplant candidate with a metabolic disease **which causes severe hyperammonemia such as the urea cycle defects Ornithine Transcarbamylase Deficiency (OTC) or Crigler-Najjar Disease Type I** shall be assigned the medical urgency ranking, either Status 1 or the PELD score, that, in the judgment of the patient's transplant physician, appropriately reflects the patient's medical urgency upon application by his/her transplant physician(s) and justification to the applicable Regional Review Board. The patient, if not already a Status 1, may be upgraded to a Status 1 if the patient is hospitalized for an acute exacerbation of their disease. The patient shall remain a Status 1 as long as he or she remains hospitalized. Decisions by the Regional Review Boards in these cases shall be guided by standards developed jointly by the Liver/Intestinal Organ Transplantation and Pediatric Transplantation Committees. Status 1 cases must receive retrospective review by the applicable RRB. Those cases where a higher PELD score is requested must receive prospective approval by the applicable RRB within twenty-one days after application; if approval is not given within twenty-one days, the patient's transplant physician may list the patient at the higher PELD score, subject to automatic referral to the Liver and Intestinal Organ Transplantation and Membership and Professional Standards Committees.

Proposed Region 5 Liver Sharing Agreement

Mandatory sharing of donor livers for status 1 patient will continue with two fundamental changes: 1) the definition of status 1 will be modified in 2 of 4 categories as currently indicated in UNOS policy (see below), 2) there will no longer be a payback system in place.

The logic of the status 1 re-definition is predicated on the perception that currently, many status 1 listings in our region are inappropriate. Please note that the status 1 changes will apply only to deceased-donor whole organs and will not apply to either living donor or split organs.

It must be conceded that the current proposal does not attend to the concerns of all members in the region. However, we must acknowledge the intent of HHS final rule to both 1) equalize waiting times across the United States, and 2) prioritize patients according to “sickest first”.

The proposal also includes a commitment to look at the data regarding the flow of organs in our region at 3-month intervals.

Proposed Status 1 redefinition:

Current UNOS Policy:

1. Acute liver failure
2. Primary non-function ≤ 7 days*
3. HAT ≤ 7 days*
4. Acute Wilson’s

*Please note that there are no currently details regarding the definition of either PNF or HAT.

Proposed Policy:

1. Acute liver failure
2. Primary non-function ≤ 10 days as defined by:
 1. AST ≥ 5000 and one or both of the following:
 - 2A. INR ≥ 2.5
 - 2B. Acidosis: pH ≤ 7.3 and/or Lactate $\geq 2x$ normal
 3. Anhepatic patient (stands alone)
3. HAT ≤ 10 days as defined by PNF above

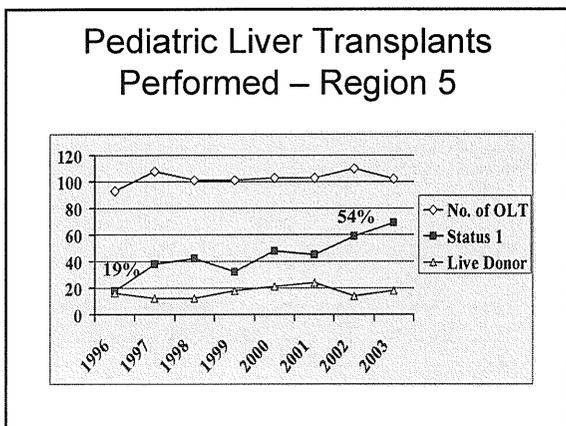
HAT not meeting PNF criteria will be listed at a MELD of 40 to confine such patients to the local OPO and avoid affecting the entire region (does not apply to living donor /split organs)

4. Acute Wilson’s

The Issues

The Region 5 Plan Must:

- ❖ Pass public scrutiny and serve the patient's interest
- ❖ Be compliant with HHS guidelines
the system must be designed to serve the most ill patient
- ❖ Must respect patient flow
organs must follow the patients
- ❖ Not move organs from OPOs with ill patients to OPOs/Centers
with low MELD score
- ❖ Not serve the interests of transplant programs



**Major Concerns and the Majority of
Physicians in Region 5 Believe That:**

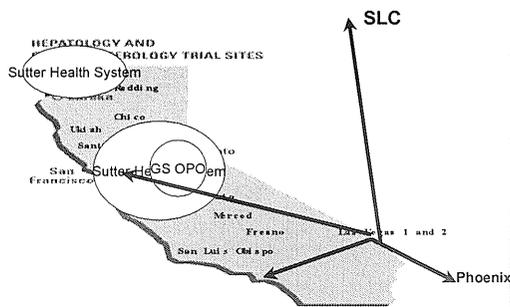
- ❖ Establish definitions that eliminates gaming the system
- ❖ Eliminate children with chronic liver disease being listed as status 1
- ❖ Establish rapid prospective systems to review special patient listings
to minimize gaming the system
- ❖ We must diminish the number of patients transplanted with a low MELD
especially MELD scores of less than 15
- ❖ We must resolve concerns that Medicare/HCFR/CCS will next investigate
centers boarding pediatric patients in ICUs to promote organ
acquisition (make clear criteria for ICU admissions for children)
- ❖ Are there medicoLegal concerns?
- ❖ There is the reality of socioeconomic discrimination with the current
system

The Issues

The Payback System

- ❖ Does Not Pass public scrutiny and serve the ill patient's best interest
- ❖ Does Not Pass scrutiny that it is compliant with HHS guidelines that the most ill patient receives a liver transplant
- ❖ Does Move organs from OPOs with ill patients to OPOs/Centers with low MELD score
- ❖ Does Not Serve the interests of transplant programs that service more ill patients and rewards OPOs with local monopolies

Our Regional Transplant Programs



Our Proposal

Works

- ❖ Passes public scrutiny and serves the ill patient's best interest
 - ❖ By eliminating the payback system
- ❖ Passes public scrutiny and is compliant with HHS guidelines that the most ill patient receives a liver transplant
- ❖ Moves organs to the most ill patients
- ❖ Serves the interests of patients and eliminates the local monopolies that drive patients with robust insurance to seek liver transplants regionally or nationally, thereby eliminating the socioeconomic discrimination that exists

Our Proposal

Works

❖ **Defines HAT**

❖ **Defines PNF**

Status 1

1. Acute liver failure
2. Primary non-function ≤ 10 days as defined by:
 - 1. AST ≥ 5000 and one or both of the following:
 - 2A. INR ≥ 2.5
 - 2B. Acidosis: pH ≤ 7.3 and/or Lactate ≥ 2x normal
 - 3. Anhepatic patient (stands alone)
3. HAT ≤ 10 days as defined by PNF above
 - HAT not meeting PNF criteria will be listed at a MELD of 40 to confine such patients to the local OPO and avoid affecting the entire region (does not apply to living donor /split organs)
4. Acute Wilson's

What else can be done?

Immediately

- ❖ Place a minimum MELD for listing at 10
- ❖ Place a minimum MELD for OLT at 17
 - ❖ Unless R(N)RB reviewed and approved prospectively
- ❖ Make sure no organ moves from a high MELD Patient To a low MELD Patient unless RRB approved
- ❖ Move region 5 from the caboose on the train to a leadership position that reflects HHS mandates and moves the UNOS/OPTN to an advanced position in organ distribution
- ❖ Remove the constant concern about Medicare/HCFA/CCS investigations and the threat of a decision being made in the courts not within our organization

Summary of Public Comments: Item 15

**Proposed Modifications to the Region 5 Status 1 Sharing Agreement (Liver and Intestinal Organ
Transplantation Committee)**

As of 4/29/2004, 89 responses have been submitted to UNOS regarding this policy proposal. Of these, 22 (24.72%) supported the proposal, 8 (8.99%) opposed the proposal, and 59 (66.29%) had no opinion. Of the 30 who responded with an opinion, 22 (73.33%) supported the proposal and 8 (26.67%) opposed the proposal. Comments on the proposal received to date are as follows:

I: Individuals Comments:

Comment 1:

vote: Support

A major step forward on all fronts

Committee Response:

Comment 2:

vote: No Opinion

Approve - no comments.

Committee Response:

Comment 3:

vote: No Opinion

Very complicated. I trust the region to decide in its best interest

Committee Response:

March 2004

REGIONAL COMMENT SUMMARY

PROPOSAL 15: Proposed Modifications to the Region 5 Status 1 Sharing Agreement (Liver and Intestinal Organ Transplantation Committee)

Sponsoring Committee: Liver and Intestinal Organ Transplantation Committee

Description: The proposed changes to the Region 5 Status 1 sharing agreement would eliminate the provision for payback for Status 1 shares. The definition of Status 1 for both adult and pediatric candidates will be redefined to better identify patients in urgent need of a liver. These changes are recommended by the OPTN/UNOS Liver and Intestinal Organ Transplantation Committee, having been charged by the Board of Directors to adjudicate the issue.

DATE THIS DOCUMENT MODIFIED: 5/3/04

Region	Meeting Date	Motion to Approve as Written	Approved as Amended (See Below)	Approved by Consensus	Did Not Consider
1	3/22/04	13 yes, 0 no, 0 no opinion			
2	5/07/04	22 yes, 3 no, 6 no opinion			
3	3/26/04	15 yes, 0 no, 2 no opinion			
4	4/2/04	27 yes, 1 no, 3 no opinion			
5	4/30/04		18 yes, 10 no		
6	4/2/04	40 yes, 1 no, 12 no opinion			
7	4/23/04				yes
8	4/2/04	0 yes, 12 no, 12 no opinion			
9	4/21/04	11 yes, 0 no, 7 no opinion			
10	4/30/04	11 yes, 0 no, 5 no opinion			
11	3/26/04	13 yes, 0 no, 7 no opinion			

COMMENTS:

Region 5: Region 5 approved the proposal with the following amendments:

- HAT criteria should be increased to 10 days following transplant (Regional vote: 28 yes, 0 no)
- Payback should be reinstated for 6 months following implementation of the proposed agreement. After 6 months, the agreement could be evaluated to determine the affect of the modifications to Status 1 criteria. (Regional vote: 16 yes, 12 no)

Committee response: The Committee agrees that the HAT criteria may be expanded. The Committee approved the proposal as written with respect to the elimination of the payback. The proposal has a provision to evaluate the policy atg six months.

Region 8: The region voiced concerns that by approving this motion it would serve as a precedent for the Liver/Intestine Committee to dictate regional sharing agreements.

Committee Response: Region 5 has not been able to reach consensus on this issue. The Liver Committee and the Board have repeatedly tried to obtain consensus in Region 5; the Committee's intervention was seen as a last resort.



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MEMORANDUM

To: Region 7 Liver Program Directors
Region 7 OPO Executive Directors

CC: Steven Flamm, MD
Region 7 Liver/Intestine Committee Representative

From: Christopher Johnson, MD
Region 7 Councillor

Subject: Modified Region 7 Status 1 Liver Sharing Agreement

According to the Region 7 Status 1 Variance, an annual review must be done by the region and reported to the OPTN/UNOS Liver Intestine Committee. On Monday, September 15 there was a meeting for the Region 7 Liver Program and OPO Directors. Nine of the twelve liver programs in Region 7 were represented. Representatives from all four OPOs were in attendance as well.

The group reviewed data and discussed the Region 7 Status 1 Liver Sharing Agreement. By a unanimous vote it was decided that the agreement should be modified. Attached you will find a modified version of the agreement. The new language will be underlined and in italics.

A payback shall be required as soon as an OPO has accumulated a debt to any other OPO in Region 7, and shall be of the first local liver that is ABO identical to the liver shared under this variance which is not needed for a local Status 1 patient. However, to increase the flexibility of programs to care for a patient with a calculated MELD or PELD score greater than or equal to 25, the immediate payback requirement may be suspended by an OPO in favor of a the patient with a calculated MELD or PELD score greater than or equal to 25 as long as it has an outstanding debt of fewer than four livers to any OPO or the Wisconsin Combined OPOs. If an OPO decides to use this option, the liver must be used for the local patient who has a calculated MELD or PELD score greater than 25. NOTE: This provision excludes patients with HCC, Familial Amyloidosis, Primary Oxalosis and other exceptional requests with MELD or PELD scores greater than or equal to 25.

Donors who meet any of the following criteria will not be offered for payback:

- Age greater than or equal to 70
- Positive Serologies- Hepatitis C, Hepatitis B Core Antibody, Hepatitis B Surface Antigen, HIV, HCV, HTLV
- Offers will not come from donors after the start of the organ procurement procedure
- Donors after Cardiac Death (DCD)

Region 7 Variance Background Information

In approving the Regional Status 1 Liver Sharing policy, the UNOS Board, by a vote of 32 for; 3 against; and 0 abstentions, also required that all UNOS regions that do not already have regional sharing agreements develop such agreements. In this respect, the Board moved that, to help UNOS regions develop now required regional mandatory liver Status 1 sharing agreements, the UNOS Liver and Intestinal Organ Transplantation Committee be tasked with a.) Exploring the experience of other regions with such agreements that have been shown to work; and b.) Assisting regions in developing systems tailored to regional experience and concerns.

Region 7 Variance

The purpose of this variance is to increase the chance of availability of organs for Status 1 patients with a critical need. It is hoped this will improve survival of patients in this category. It is recognized that the impact of this change must be experienced and reviewed by all parties before additional step-wise changes can be made so that the utility and equity of each change can be evaluated by all the parties to this variance.

Mandatory Sharing

There will be mandatory sharing of donor livers for Status 1 patients throughout region 7. Throughout this variance, the term "status 1" is identical to the definition of status 1 established at the June 1997 meeting of the UNOS Board of Directors.

Donor organs of acceptable blood type available within region 7 shall be allocated first to patients listed as status 1 at the local OPO. If no patient is listed as status 1 at the local OPO, then the organ shall be allocated to patients listed as status 1 anywhere within region 7. If more than one status 1 patient is listed in region 7 the organ shall be allocated first to the patient with the longest waiting time in status 1. If two or more patients are listed for the same period of time, then the organ shall be allocated according to the following tie-breakers in order: 1) by blood type: to ABO identical recipients before ABO non-identical but compatible recipients. (Livers will not be offered under this variance to ABO incompatible recipients.); 2) to the recipient with the longest total waiting time; 3) to the recipient listed at the center closest to the OPO offering the organ. If the liver is not allocated and accepted for a Status 1 patient in Region 7, then the liver shall be allocated in accordance with the current UNOS policies. UNOS shall implement the appropriate change in the computer to support this variance.

Centers must comply with the standard requirements for listing with UNOS for status 1 as adopted by the UNOS board of directors in June 1997.

For the purposes of this variance each local area shall be defined as:

Regional Organ Bank of Illinois (ROBI)-Liver Programs it serves

Lifesource of Upper Midwest-Liver Programs it serves-

Wisconsin-Combined OPOs- Univ. of Wisconsin/Wisconsin Donor Network

Role of Regional Review Board

The regional review board shall review the listing of all status 1 patients according to protocol that will be determined by the region and UNOS. The findings of the review board will be made available to all liver transplant centers within the region. In addition, histology reports of the explanted organ, angiography reports and a summary of the patient's course will be forwarded to the regional review board for subsequent evaluation of patients receiving organs under this variance. The regional review board will also adjudicate any disputes over credits and debits at 3-month intervals.

Payback

The debt of an OPO that has received a liver will be increased by one and the credit of an OPO that has shared a liver will be increased by one any time a liver is shared under this variance. In the same fashion an OPO's debt will be reduced by one and the credit of the receiving OPO will be decreased by one when an organ is paid back under this variance.

Debts and credits accumulated by an OPO expire at the end of the calendar year, except when an OPO's debt to another OPO exceeds four. When an OPO's debt to another OPO exceeds four at the end of a calendar year, the excess debt (i.e. debt above four) will carry over to the next calendar year.

A payback shall be required as soon as an OPO has accumulated a debt to any other OPO in Region 7, and shall be of the first local liver that is ABO identical to the liver shared under this variance which is not needed for a local Status 1 patient. However, to increase the flexibility of programs to care for a patient with a calculated MELD or PELD score greater than or equal to 25, the immediate payback requirement may be suspended by an OPO in favor of a the patient with a calculated MELD or PELD score greater than or equal to 25 as long as it has an outstanding debt of fewer than four livers to any OPO or the Wisconsin Combined OPOs. If an OPO decides to use this option, the liver must be used for the local patient who has a calculated MELD or PELD score greater than 25. NOTE: This provision excludes patients with HCC, Familial Amyloidosis, Primary Oxalosis and other exceptional requests with MELD or PELD scores greater than or equal to 25.

Donors who meet any of the following criteria will not be offered for payback:

- Age greater than or equal to 70
- Positive Serologies- Hepatitis C, Hepatitis B Core Antibody, Hepatitis B Surface Antigen, HIV, HCV, HTLV
- Offers will not come from donors after the start of the organ procurement procedure
- Donors after Cardiac Death (DCD)

In the event that an OPO with a debt of four livers has an available liver and there are no local or regional status 1 recipients, if there is a special circumstance in the debtor OPO, advance agreement of both the debtor and creditor OPOs is required for the liver to be used for the special circumstance by the debtor OPO. Regardless of debt or credit circumstances, OPOs are encouraged to payback livers shared under this variance whenever possible.

The maximum credit positions that an OPO or the Wisconsin Combined OPOs will be required to maintain at any time is four, except as noted below. The offer of a pay-back will be to the OPO within Region 7 with the longest standing credit for a liver shared in accordance with this policy, and, if accepted, will be allocated within that OPO to the patient with the highest MELD or PELD score.

Payback will be with a liver that is ABO identical to the liver shared under this variance which is not needed for a local status 1 patient. However if an OPO within Region 7 has a credit position of four livers, a payback to this OPO will take precedence over an OPO that is not at the maximum credit position but which has a longer standing credit. If the organ is not accepted by the first OPO, it shall be offered to the OPO with the next longest outstanding credit, and so forth. If all OPOs owed livers under this policy decline the offer, then the organ will be offered in accordance with UNOS policy.

In the event an OPO with a credit position of four has a liver available for a Status 1 patient at a center served by an OPO that has accumulated a debt of four to the OPO with the liver, the threshold of four shall be suspended if the debtor OPO agrees to pay back the next 2 local livers that are not needed for a local Status 1 patient to the sharing OPO.

If an OPO or OPOs owed a liver under this variance decline to accept any offered liver but the liver is successfully used by the offering OPO, the offering OPO's debt is reduced by one and the first OPO that declined the payback will have its credit total reduced by one. ~~Each~~ All four OPOs will be given 2 exemptions per calendar year to this provision. When an offer is declined by a creditor OPO as an exemption and no other creditor OPO accepts the payback, the debt and credit levels of the OPOs will remain unchanged. It is the responsibility of each OPO to keep track of their exemptions and report them to UNOS.

If an OPO receives a shared liver and an arrangement is made with the host OPO to perform a Left Lateral Segmental Split where the accepting OPO only uses the segment and leaves the remainder of the liver for the host OPO, then the accepting OPO would not accrue a debt.

Status 1 Shares, for whom there is no local active, size and age appropriate pediatric recipient listed at the offering OPO, will not accrue a debt.

Status 1 Shares for whom there is a local active, size and age appropriate pediatric recipient listed at the offering OPO will accrue a debt.

It will be the responsibility of each OPO in Region 7 to report Status 1 Regional Shares and Paybacks to the UNOS Organ Center in order to keep records of the debts and credits of each Region 7 OPO.

This variance shall remain in force for as long as 75% of the participants agree. After one year, and each year thereafter, there shall be a review of the impact of this variance on organ allocation within the region. Any renewal or change in the variance must be agreed to by all relevant UNOS representative members in Region 7 before submission to UNOS for approval. Annual reviews will include the following outcome measurement:

Number of organs shared under this variance

Number of deaths waiting in status 1

Effect of Variance on all other Statuses

Incidence of all causes of graft loss and retransplantation

Patient and graft survival

Number of organs not recovered or discarded

Number of payback organs

Number of payback organ offers declined

General review of organs shared and recipients receiving organs under this sharing variance

Region 7 Status 1 Variance Algorithm-

Local (combined list for University of Wisconsin and Wisconsin Donor Network)

Status 1 patients in descending point order

Region 7

Status 1 patients in descending point order

(It could be programmed that all non local regional status 1 candidates will print here providing the OPO running the match owes less than 4 Livers per OPO.)

Region 7 Payback (The payback status of all region 7 OPOs.)

(Paybacks indicated here are subject to being passed over in favor of patient with a calculated MELD or PELD score greater than or equal to 25 under circumstances described in paragraph 2 on page 2). The offer of a pay-back will be to the OPO within Region 7 with the longest standing credit for a liver shared in accordance with this policy, and, if accepted, will be allocated within that OPO to the patient with the highest MELD or PELD score.

Donors who meet any of the following criteria will not be offered for payback:

- Age greater than or equal to 70
- Positive Serologies-Hepatitis B Core , Hepatitis C, Hepatitis B Surface Antigen, HIV, HCV
- Payback offers will not come from Donors prior to O.R.
- Donors after Cardiac Death (DCD)

Local

Local patients in descending order of MELD or PELD scores

Regional

Regional Patients in descending order of MELD or PELD score

National

National Patients in descending order of MELD or PELD score



Missouri Statewide Liver ALU

Dean Kappel – MTS
Rob Linderer – MTN

Proposed Allocation

Livers recovered in Missouri hospitals would be allocated according to MELD/PELD as follows:

1. Status 1 patients within Region 8
2. All liver patients on the recovering OPO list
3. All liver patients on the other OPO list
4. All liver patients within Region 8
5. All liver patients within the U.S.

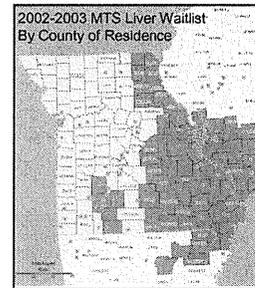
Where do Missouri residents get transplanted? (1997 – 2002)

- 74% were listed in Missouri
- 18% were listed in Region 8, including University of Kansas
- 8% were listed in 12 states

N = 880
Source: UNOS

Why is this ALU fair?

- 25% of patients listed at MTS centers actually live within the MTN service area



Missouri Medicaid Liver Patients Transplanted and Listed (FY 2002-2003)

Center	Transplanted	Listed	Total	%
Barnes-Jewish (MO)	13	19	32	45%
Cardinal Glennon (MO)	6	1	7	10%
Children's Mercy (MO)	3	2	5	7%
Kansas University (KS)	2	4	6	8%
St. Louis Children's (MO)	2	1	3	4%
Saint Louis University (MO)	6	9	15	21%
Univ. of Nebraska (NE)	3	0	3	4%
			71	100%

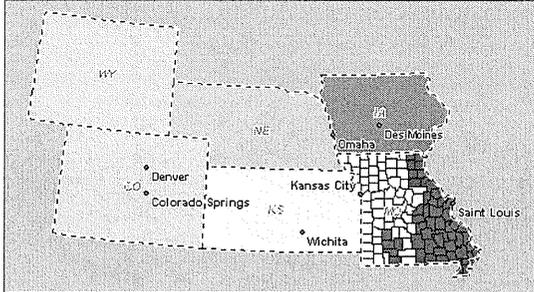
Source: MO Dept. of Social Services, Medicaid Division, letter dated 1/9/04.

88% of Medicaid Patients are Transplanted at MO Centers.

Why is this ALU fair?

- Missouri residents should have equal access to organs from Missouri hospitals. This is true for all of Region 8 except Missouri.
- All livers recovered in Kansas will follow the customary UNOS algorithm. (50% of MTN donors)
- 88% of Missouri Medicaid patients needing a liver are being listed at Missouri centers.

Region 8 Organ Procurement Organization Territories



Will this ALU improve wait time disparities?

Time to Transplant
Liver Patients Registered 7/1/97 – 12/31/02

OPO	25 th Percentile	50 th Percentile
Mid-America Transplant Services	5.6 mos	37.2 mos
Midwest Transplant Network	.7 mos	2.2 mos
Nebraska Organ Recovery System	2.8 mos	11.2 mos
Iowa Donor Network	1 mo	3.4 mos
Donor Alliance	9.7 mos	--

Source: SRTR

Patient Listing Practices in Region 8

New Patients Listed (7/1/02-6/30/03)

	KU (N=37)	Porter (N=5)	Univ. of CO (N=182)	NE (N=140)	SLUH (N=59)	Barnes (N=66)	Univ. of IA (N=52)
Status 1	2.7		2.2	6.4	5.1	1.5	9.6
Meld 6-10	5.4	40	31.3	12.9	11.9	11.5	11.5
11-20	45.9	60	51.6	38.6	47.5	63.9	61.5
21-30	27		7.1	10	18.6	18	13.5
31-40	16.2		2.2	5.7	11.9	4.9	3.8
PELD ≤10				2.9			
11-20				8.6			
21-30			.5	6.4			
≥31				2.1			
Other	2.7		4.9	6.4	5.1		

Source: SRTR

Liver Transplants in Region 8 by MELD Score 7/1/02-6/30/03

Transplant Center	N	Status 1	MELD 6-10	MELD 11-20	MELD 21-30	MELD 31-40	PELD ≥10	PELD 11-20	PELD 21-30	PELD 31+
Univ. Hospital – Univ. of CO Health Science Center	67	5.3	8.8	35.1	26.3	22.6	0.0	0.0	1.8	0.0
Centura Porter Adventist Hospital	3	33.3	33.3	33.3	0.0	0.0	0.0	0.0	0.0	0.0
The Children's Hospital	9	44.4	0.0	0.0	0.0	0.0	33.3	11.1	11.1	0.0
Nebraska Medical Center	67	9.2	10.3	31.0	23.0	8.0	9.2	8.0	1.1	0.0
Univ. of KS Medical Center	23	4.3	0.0	52.2	30.4	13.0	0.0	0.0	0.0	0.0
Univ. of IA Hospitals & Clinics	39	7.7	2.6	69.2	17.9	2.6	0.0	0.0	0.0	0.0
Barnes-Jewish Hospital	41	0.0	17.1	43.9	26.8	12.2	0.0	0.0	0.0	0.0
Cardinal Glennon Children's Hospital	6	50.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0
St. Louis Children's Hospital	6	33.3	0.0	0.0	0.0	0.0	66.7	0.0	0.0	0.0
The Children's Mercy Hospital	6	16.7	0.0	0.0	0.0	0.0	83.3	0.0	0.0	0.0
St. Louis Univ. Hospital	28	3.6	10.7	50.0	17.9	17.9	0.0	0.0	0.0	0.0

Summary

- All states in Region 8, with the exception of Missouri, have the entire state as the first level of allocation.
- 74% of MO residents go to MO centers
- 88% of Medicaid patients go to MO centers-96% when including KU
- No MO Medicaid Patients have been listed at centers outside of this ALU in last two years
- MTS has second highest mean wait time in Region 8 (Listing practices in Denver explain this difference)
- All Region 8 liver centers transplant at comparable MELD/PELD scores
- 25% of patients listed at MTS centers live in MTN service area

ALU Avoids State Legislation

- Mo residents first legislation pending in the House and Senate
- Both OPO's and all Liver Centers prefer to operate under an ALU
- Legislature agreed to withdraw both bills pending ALU approval
- Failure to address this inequity will likely result in state legislation

DRAFT POLICY GOALS

For the OPTN/UNOS Liver and Intestinal Organ Transplantation Committee, the overall goal of deceased-donor liver and intestinal allocation policies is the ongoing development of a patient-specific and evidence-based allocation system that ranks each patient using objective, measurable clinical criteria such that the practice of liver transplantation increases patient benefit. In this context, “patient-specific” refers to clinical variables that, in aggregate, can be used to stratify patients based on the risks and benefits of transplantation. The concept “net benefit” incorporates directing deceased donor livers and intestines to candidates who are likely to have increasing mortality risks and or burden of disease and for whom liver and intestinal transplantation will offer the largest possible reduction in mortality risk and/or burden of disease. For liver and intestinal allocation, the overall policy goal of net transplant benefit may include the following components:

- Reduced waiting list mortality;
- Increased post-transplant survival;
- Reduced post-transplant morbidity and burden of disease;
- Increased quality of life;
- Allow optimal patient access for transplantation;
- Efficient placement of organs; and
- Enhanced utilization of extended-criteria donors.

In pursuing these goals, the Committee should attempt to maintain or increase organ availability, preserve the public's trust in the national allocation system, and maintain a balance between justice and utility. An important aspect of maintaining trust requires that the allocation system be as transparent as possible. This requires that only objective, non-discriminatory variables are used in this process and that there is regular auditing of results. In addition, medical justice must be maintained by focusing the allocation criterion on patient-specific criteria and utility is assessed by regular evaluation of the overall results of the system.

Whether liver and intestinal allocation policies are approaching their goals will be assessed on an ongoing basis using data that reflect a number of metrics including but not restricted to the following:

- Pre- and post-transplant graft and patient survival;
- Listing, transplant, death and removal rates for various patient groups (e.g., diagnostic groups, allocation score ranges, demographic and geographic groups);
- Indicators of morbidity and quality of life, as measured by available data and current methodologies;
- Risk of progression of disease; and
- Distances traveled by patients for their transplant care;

Geographic criteria are not patient-specific and therefore are not to be emphasized in organ allocation or distribution. However, the Committee recognizes that scientific studies have continued to document the potential negative effects of increasing cold ischemia time on liver graft survival. Therefore, in order to maximize transplant benefit, some form of sharing boundary is necessary given current organ preservation limitations. The impact of distribution units used in liver and intestinal allocation should be evaluated in the context of patient-specific liver transplant benefit criteria.

National Review Board DRAFT Proposal
May 20, 2004

1. National Review Board Composition:
 - a. Board members:
 - i. One board will be elected for both pediatrics and adult.
 - ii. Board members will be active transplant surgeons or physicians.
 - iii. Each region can nominate 3 or 4 representatives.
 - iv. Board members may not designate alternates.
 - v. Board members will sign an agreement of understanding regarding the expectations of board members.
 - b. Voting
 - i. Cases submitted for review will be assigned randomly to 7 members of the board..
 - ii. The case will be closed when 4 members have voted to either support or reject the exception request.
 - iii. If a board member requests to abstain from voting, the case will be automatically reassigned to another board member.
 - iv. Cases will not be assigned to board members from the requesting center.
 - c. Pediatric cases
 - i. Appointed members will indicate whether their practice includes children.
 - ii. Pediatric cases will be assigned such that a majority of the board will be composed of practitioners that care for children.
2. Assignment of priority:
 - a. OPTION A: One exception priority allowed
 - i. Exceptions that are approved will be assigned the priority that corresponds to an estimated 3 month mortality rate of 15% (the same priority score that patients with stage II HCC receive).
 - ii. Every three months patients that have received priority will automatically receive additional MELD points equivalent to a 10% increase in mortality.
 - b. OPTION B: Center requests any priority
 - i. Centers would request whatever priority score they felt was appropriate for their patient's situation.
 - ii. Review board members would be provided with the data regarding the mean and median MELD scores at transplantation in the recipient's blood type for the OPO where the recipient is listed. The requested MELD score would be considered in light of the availability of organs where they are listed.
3. Standardized MELD Exceptions: UNET would be programmed to provide automatic exception status for the following diseases:
 - a. Hepatopulmonary Syndrome
 - i. Does the patient have evidence of hypoxemia (Room Air $pO_2 < 60$)
 - ii. Does the patient have clinical evidence of portal hypertension?
 - iii. Does the patient have evidence of intrapulmonary shunt by echocardiography or scintigraphy?
 - b. Familial Amyloidosis
 - i. Does the patient have biopsy proven amyloidosis?
 - ii. Does the patient have objective evidence of polyneuropathy?
 - c. Primary Oxaluria
 - i. Does the patient have a diagnosis of primary hyperoxaluria?
 - d. Metabolic diseases
 - i. Does the patient have a metabolic disease that produces coma due to hyperammonemia and that is treatable with liver transplantation?

Evaluation of Multiple Transplant Outcomes: A Proposal

L. G. Hunsicker, M.D.
for the Data Working Group

Rationale for a New Approach to Analysis of Transplant Outcomes

- Essentially from the beginning, analysis of transplant outcomes has focused on time to death and time to graft loss.
- While these are clearly important outcomes, with improving patient and graft survival they are no longer the only relevant outcomes to consider.
- The ACOT has recommended that the OPTN begin to collect and analyze information on the impact of transplantation on “quality of life.”

Limitations of the Exclusive Focus on Death and Graft Failure - 1

- In deceased donor kidney allocation, substantial priority is assigned to children based on the impact of transplantation on intellectual, physical, and social maturation. It is striking that there are no OPTN data dealing with the impact of early transplantation on these outcomes.
- More broadly, in children life expectancy following transplant is typically long, so that it is hard to get good data on the impact of transplantation on survival.

Limitations of the Exclusive Focus on Death and Graft Failure - 2

- In liver transplantation, the current MELD/PELD system assigns low scores to patients with cholestatic disease. These patients may not die quickly, but some have argued that they may be very sick for a long time.
- Similarly, with lung transplantation, the proposed new allocation system will give lower priority to patients with COPD relative to those with pulmonary hypertension, who die faster. But the COPD patients may have similar or worse disability.

Statistical Advantages to Broadening Examined Endpoints

- There is a strong likelihood that alternative outcomes such as morbidity and functional status will be highly correlated with mortality risk.
- But mortality (or graft failure) data can be observed only once per patient (or graft), and then “too late.”
- Cumulative morbidity and functional status can be measured on many occasions and may offer greater statistical power in analyses.
- Time-series analyses on non-terminal outcomes may permit early intervention on high risk patients.

Proposed Domains (Dimensions) of Transplant Outcomes

- Mortality
- Cumulative Morbidity: Adverse medical events, including graft loss and other events, primarily evidenced at least initially by hospitalizations.
- Functional Status: Ability to perform functions required/desired in daily life.
- Psychological Distress: Depression, anxiety, etc.
- Resource Use: Effort/resources needed to care for the patient, again focusing initially on hospitalization.

The Importance of Both Pre- and Post- Transplant Data

- At least one definition of the projected benefit of transplantation is “the difference between the projected outcomes if a transplant is performed and the projected outcomes if a transplant is NOT performed, as estimated at the time of a potential organ offer.”
- To estimate this benefit, we need to have information about the projected outcomes both of those transplanted, and those selected for transplant but still waiting.

Current and Proposed Data Sources for the Five Dimensions

MORTALITY

- Now captured by the OPTN/UNOS system, and supplemented by death data from the Social Security Master File or National Death Index.

Current and Proposed Data Sources for the Five Dimensions

Morbidity

- Limited hospitalization data is now collected on transplant recipients. The new forms will ask post-transplant patients about **all** hospitalizations since last reports. UNOS/OPTN collects no data about waiting-list patient hospitalizations.
- CMS collects complete data on kidney candidates and recipients who have Medicare primary coverage.
- We have obtained consent Pennsylvania and Virginia to get comprehensive hospitalization data on transplant candidates and recipients from those states (as a starter).

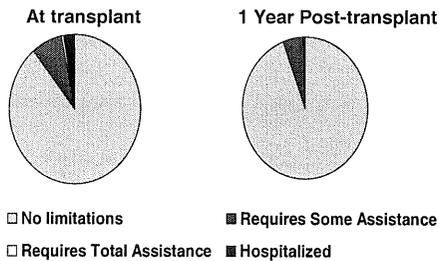
Current and Proposed Data Sources for the Five Dimensions

Disability/Functional Status - 1

- UNOS/OPTN collects functional status information on transplant recipients at transplant and on follow-up forms, but on transplant candidates only at the time of registration. While these data correlate with outcomes, the grading is not sufficiently granular to capture less than gross loss of function.

Reported Functional Status* at Transplant and 1 year Later

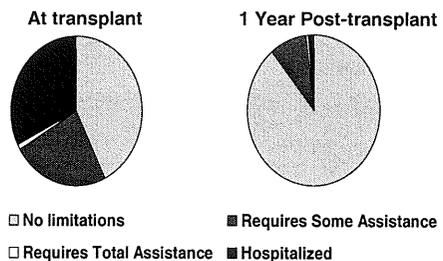
Kidney Transplants in 2002



* Ability to perform activities of daily living

Reported Functional Status* at Transplant and 1 year Later

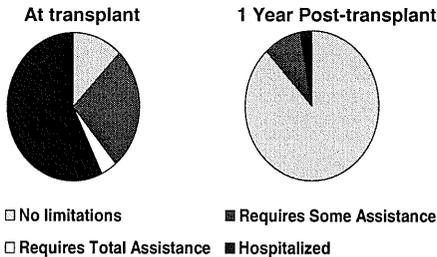
Liver Transplants in 2002



* Ability to perform activities of daily living

Reported Functional Status* at Transplant and 1 year Later

Heart Transplants in 2002



* Ability to perform activities of daily living

Current and Proposed Data Sources for the Five Dimensions

Disability/Functional Status - 2

- We propose to capture this information in our pilot using the SF36 physical scale and replacing the current UNOS functional scale with the Karnofsky Index.
- The Karnofsky Index has 10 levels of function spread from minor impairments that do not adversely affect function to a moribund state.
- It is the standard, best validated objective scale for functional status.
- It can be completed at the time of patient clinic visits in less than one minute.

Karnofsky Index

NY Heart

100	Normal; no complaints; no evidence of disease	No limitations
90	Able to carry on normal activity; minor signs or symptoms of disease	
80	Normal activity with effort; some signs or symptoms of disease	
70	Cares for self; unable to carry on normal activity or to do active work	
60	Requires occasional assistance, but is able to care for most of own needs.	Requires some assistance
50	Requires considerable assistance and frequent medical care	
40	Disabled; requires special care and assistance	Requires total assistance
30	Severely disabled; hospitalization indicated although death not imminent	
20	Very sick; hospitalization necessary; active, supportive treatment necessary	Hospitalized
10	Moribund; fatal processes progressing rapidly	
0	Dead	

Current and Proposed Data Sources for the Five Dimensions

Psychological Distress

- No data collected currently by UNOS/OPTN.
- We propose to collect this information from the SF36 mental scale.

Current and Proposed Data Sources for the Five Dimensions

Resource Use

- UNOS/OPTN currently collects no data on this subject, although the NOTA mandates the assessment of costs.
- We propose to estimate effort needed to care for the patient at least initially from hospitalization data, using uniform coding based on the DRGs weights and length of stay.

Relation of the Proposed Analysis to UNOS/OPTN Policy Formulation

- There is no intent for the proposed analyses to force any particular approach to the formulation of deceased donor organ allocation or other UNOS/OPTN policy.
- The proposed approach to analysis will simply inform UNOS/OPTN committees more broadly about the outcomes of transplantation.
- The Board and the Committees will remain free to use the information as they find appropriate, considering the multitude of different considerations.

Three Approaches to Analysis of Alternative Endpoints - 1

- Each endpoint can be analyzed separately, using traditional methods. But this approach does not facilitate study of the mutual correlations and trade-offs among the outcomes.
- The impact of morbidity, functional status, and the like can be integrated with survival, using a “quality adjusted life years” approach. But the weighting given to the various outcomes is both rather arbitrary and very variable among individuals.

Three Approaches to Analysis of Alternative Endpoints - 2

- The multiple outcomes can be studied in a model with a multivariate outcome. That is, outcomes in all the different dimensions can be considered as a single vector (per individual). In this approach the mutual correlations among the outcomes are observed directly (as the covariance matrix) in the analysis.
- This approach is objective, and leaves the weighting of the components (if needed) to the policy makers and individual physicians/patients.
- The observation of negative correlations can elucidate trade-offs in therapeutic decisions.

Methods for Combined Analysis of Multiple Outcomes

- Analysis of a multivariate outcome (multiple outcomes in a single model) is a statistically innovative and challenging approach, particularly when the outcomes are scaled differently.
- We assume that different groups (SRTR, OPTN, HHS, other interested investigators) may want to work out different methods, and we encourage this.
- The final approach chosen by different analysts may differ because they have different goals:
 - Optimize use of limited resources (organs or costs)
 - Optimize outcomes for a particular patient.

Analyzing multiple outcomes for transplant candidates and recipients

SRTR

Robert A. Wolfe

Evaluation of the benefit of transplant involves many outcomes

- **Rate measures**
 - Mortality – once per subject
 - Hospitalization – possibly many per subject
- **Scaled measures**
 - Days in hospital – possibly cumulative
 - Resource use – possibly cumulative
 - Functional status – possibly weighted average
 - Psychological distress – possibly weighted ave.

Analytic Methods

- **Tabulation and description**
- **Stratified analyses show the average outcome for each subgroup of patients.**
- **Regression analyses predict each outcome based on multiple patient characteristics.**
- **Longitudinal models predict outcome based on past history (including previous outcomes).**
- **Correlation models**

Modeling Combined Outcomes: traditional methods

- Outcomes are often correlated.
 - Patients high on one outcome might be high on another
- Correlation can arise from shared measured characteristics: covariates predict multiple outcomes.
 - Diabetics have both high hospitalization and high death rates.
- Correlation can be modeled with regression: one outcome predicts another:
 - Mortality can be predicted by recent hospitalization and recent low functional status.

Modeling Combined Outcomes: new methods

- Frailty models introduce a patient specific covariate to account for correlation. Frailty is an unmeasured covariate.
 - The frailty predicts the outcomes of interest (rates or means).
 - The frailty for each patient is imputed to fit the outcomes for that patient
- Bailey et al have recently developed an innovative method to analyze correlated outcomes.

Beyond Survival: Predicting and Using the Burden of Disease to Support Decision-Making in Organ Transplantation

H. Krakauer
R. C. Bailey
M. J-Y. Lin

Division of Transplantation, SPB, HRSA

Modeling the Components of the Burden of Disease

Four critical decisions underlie the modeling of the components of the burden of disease:

- (1) Every component is to be represented by a cumulative measure, that is, a quantity accumulated over the period of observation.
- (2) The probability that a range of the values of a measured component or a set of ranges of values of any combination of components will be observed in an individual will be computed as the consistent metric in the analyses and the predictions.

Modeling the Components of the Burden of Disease (cont'd)

- (3) The mathematical representation of the components of the burden of disease must conform as closely as possible to the patterns actually observed. This is most easily achieved by the use of fully parametric representations tailored to the observed distributions.
- (4) The interdependence of the components (correlations) must be modeled explicitly.

With this approach, distributions of each outcome can be transformed to a normal distribution, and the multivariate outcome modeled using well-understood multivariate normal theory.

What kinds of questions could be answered?

- **Benefit:** What is the outcome for the average patient with and without transplant?
- **Policy:** How would outcomes be changed by policy changes?
- **Subgroups:** What are the differences among patient subgroups?
- **Individuals within subgroups:** How much variation is there among individuals?
- **Correlation:** Are the individuals who are at high risk for one outcome also at high risk for other outcomes?

An important Distinction

- Formulation of public policy such as for allocation of deceased donor organs (by type), requires choice (by the policy makers) of a single final metric based on weighting of one or more of the outcomes. I.e., the *offer* of an organ must be objective.
- But the decision of a patient and his/her doctor to *accept* an organ may be based on each individual's weighting of the outcomes. Reporting the multivariate outcome (rather than using a common weighting such as a QALY) permits each individual to bring his/her own preferences to the decision.

Specific Recommendations of the DWG to the UNOS DAC

- Replace the present functional status scale on the UNOS data collection forms with the Karnofsky Index
 - We have been assured that this would require only substitution of the Karnofsky functional levels for those on the current pick list.
 - That is, this change would not require any action by OMB and could be implemented at any time.
- Consider (and possibly endorse) the DWG proposed pilot study of collection of SF36 data.

Proposed Pilot to Collect SF36 Data

- Study to be done by UNOS/OPTN as part of contract for next budget cycle.
- Targeting 500 returns per group, we will send out 600 forms for adult (18 or older) patients:
 - Each organ transplant type
 - Patients on waiting list (at listing and median time to transplant or six months, whichever is less)
 - Transplant recipients at time of transplant, 6 months, and one year.
- We will also design a separate trial for children (< 18 years old) in cooperation with the Pediatric Committee.

Pilot Methods

- Patients will be selected using random sampling from UNOS/OPTN patients (over sampling for specific populations).
- The transplant centers will be contacted to get addresses and alert them of the study.
- All forms will be mailed by and returned to UNOS/OPTN to simplify IRB review and approval. Letters will include appropriate consent forms.
- Patients not returning forms will be recontacted by mail and by phone in staged strategy to maximize returns.

QUESTIONS?

RECEIVED JAN 28 2004

January 23, 2004

Via U.S. Mail and Fax

C. Wright Pinson, MD, MBA
Chairman
OPTN/UNOS Liver/Intestine Organ Transplant Committee
700 N. Fourth Street
Richmond, VA 23219

Dear Dr. Pinson:

I am requesting your guidance regarding a recurring issue regarding local liver placement in the service area. Specifically, I would like to reference the difficulties we are encountering while trying to place livers from local donors.

Typically, the allocation process proceeds with the liver routinely accepted for a local patient; however, frequently this acceptance is reversed late in the process leaving little time for subsequent placement of a transplantable liver. In these cases, the liver is often declined after it has been recovered and transported to the transplant center. The reasons given for these last minute turndowns include: unacceptable laboratory values which had been reported to the transplant center hours earlier, unacceptable medical/social history which had been reported during the initial offer, transplant program too busy due to other transplant recipient issues, secondary biopsy performed at the transplant facility with dramatically different results, organ injury, and "not as advertised".

On one occasion a regional transplant surgeon questioned why we would even consider placing a liver if the local center deemed it "not suitable" for transplant; that particular liver was placed and transplanted with good function. Additionally, the local liver program has accepted two livers from two different donors for the same intended recipient.

Fortunately, in most cases involving last minute turndowns, we have been successful in finding a recipient regionally or nationally. However, other regional transplant programs have voiced their concerns regarding the routine nature of this last minute reversal practice. In fact, some regional programs will no longer provide backup for our liver offers based on the unavoidable time restrictions placed on their transplant center.

We have addressed this situation with the local transplant center and, to date, our efforts have been met with little success. At this time we are looking to the OPTN/UNOS Liver/Intestine Organ Transplant Committee to provide direction and/or resolution to this difficult situation. We appreciate any assistance you can provide in this matter and remain committed to maintaining the integrity of the donation and transplantation process. Please feel free to contact me if you require further information.

Attachment: E-mail

cc: