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Saudi Center for Organ Transplantation

Liver Allocation Policy

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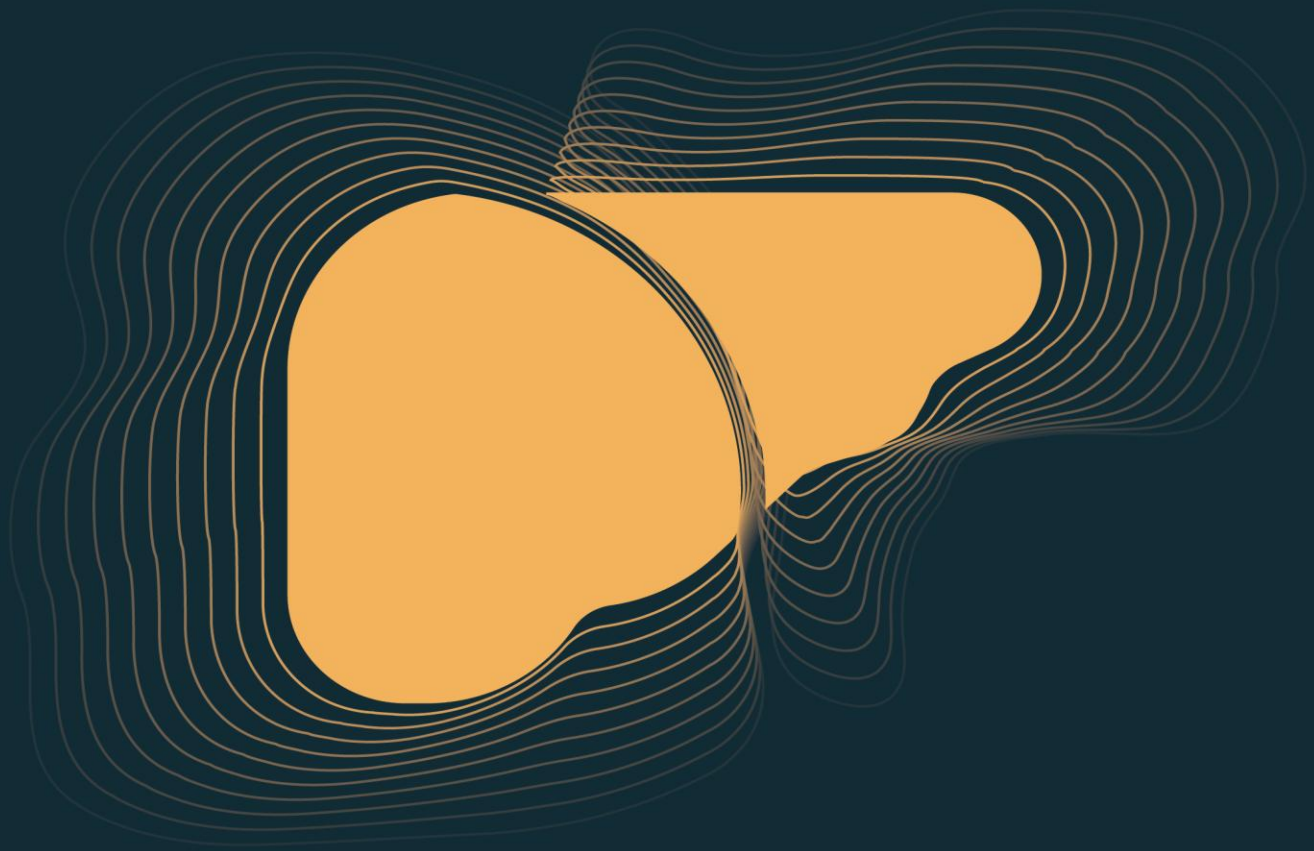

Liver Allocation Policy

1. PURPOSE

The purpose of this Policy is to ensure equitable and efficient allocation of a deceased donor liver to minimize waitlist mortality, maximize transplantation outcomes and benefit patients in need.

2. RELATED DOCUMENTS

2.1 General Organ Allocation policy

2.2 Data sharing and privacy policy

2.3 Deceased donor Management Policy

2.4 Post Consent Donor Management policy

2.5 Disposal of Discarded Human Organ/Tissue Policy.

3. DEFINITION

3.1 **Allocation**: the process used to match donated organs with candidates/centers needing a transplant.

3.2 **Recipient**: The patient to who receives the donated human organ through transplantation of the organ into theirbody.

3.3 **Donor**: A person who voluntarily permits donation of their organs or tissues to another person in need of a transplant. This can occur in 2 ways:

3.3.1 Living Donor: A living donor donates an organ or tissue while they are still alive

3.3.2 Deceased Donor: A deceased donor donates their organs or tissues after their death.

3.3.2.1 Deceased donation requires the consent of the donor or their family/successor according to the provisions of the regulations in addition to medical professionals who determine if the organs are suitable for donation.

3.4 **HLA**: Human Leukocyte Antigen

3.5 **Fulminant (Acute) Hepatic Failure (FHF)** — also referred to as Acute Liver Failure (ALF) — is defined as the rapid deterioration of liver function in an individual without pre-existing liver disease or cirrhosis, characterized by the development of hepatic encephalopathy and a prolonged international normalized ratio (INR) ≥ 1.5 occurring within 26 weeks of symptom onset.

3.6 **AST (Aspartate Aminotransferase):** An enzyme that is found mostly in the liver, but it is also in heart, muscle and other organs in the body. When liver cells are damaged, they release AST into the bloodstream.

3.7 **ALT (Alanine Transaminase):** An enzyme found mostly in the liver that helps the body break down proteins. When liver cells are damaged, they release ALT into the bloodstream.

3.8 **GGT (A gamma-glutamyl transferase):** An enzyme found throughout the body, but it is mostly found in the liver. High levels of GGT in the blood indicate liver disease, obstruction of or damage to the bile ducts and may be affected by alcohol consumption.

3.9 **ICU:** Intensive Care Unit.

3.10 **MELD-Na:** A scoring system, modified from the Model for End-Stage Liver Disease (MELD) score used to assess the severity of chronic liver disease and predict short-term mortality in patients waiting for liver transplantation. It incorporates the patient's serum bilirubin, creatinine, and INR (international normalized ratio) and sodium, to calculate a score that helps determine organ allocation priority. The higher the MELD-Na, the sicker the patient.

3.11 **PELD:** A disease severity scoring system for children under 12 years of age, designed to improve the organ allocation in liver transplantation. The calculation uses various factors including serum bilirubin, albumin, INR and the child's growth.

3.12 **INR (International Normalized Ratio):** A blood test that measures the in vitro activity of the extrinsic and common pathways of coagulation.

3.13 **SCOT Coordinator**: Health professionals appointed by the SCOT Waiting List Management and Organ Allocation Section. These coordinators are typically clinical or nursing staff members responsible for coordinating organ allocation and related processes.

3.14 **SCOT Liver Transplantation Sub-committee:** A sub-committee established under the Organ Allocation Committee, consisting of three to five members, responsible for reviewing liver transplantation–related matters, including but not limited to the allocation of exceptional cases.

4. POLICY

4.1 The responsibility of Liver Allocation relies solely on SCOT Waiting List Management and Organ Allocation Section.

4.2 SCOT Organ Allocation Framework is designed to ensure fairness, optimize transplantation outcomes, and maximize the benefits for candidates in need.

4.3 All deceased donor livers shall be evaluated for medical suitability prior to allocation.

4.4 A liver is considered valid for transplantation unless one or more exclusion criteria listed in **Table 1: Liver Acceptance Criteria** are present.

4.5 SCOT liver allocation policy mandates that liver allocation considers the attributes of **medical urgency**, **compatibility**, **waiting time**, and **organ utilization**.

4.6 **Medical Urgency:** SCOT policy requires that organ allocation considers the level of medical urgency of candidates, ensuring that those with the most critical medical conditions are prioritized for transplantation. Refer to **Table 2: Liver Priority Criteria** for details. In all priority cases, priority will be given to pediatric patients first, then according to waiting time if the medical urgency is the same.

4.6.1 Priority Status 1A – Highest Urgency (Adult and Pediatric):

4.6.1.1 Shall be assigned when a candidate has a life expectancy without liver transplant of less than seven (7) days, and meets the clinical and laboratory requirements defined in the policy for Adult or Pediatric Status 1A.

4.6.1.2 Assignment of this status requires submission of a **Liver Status 1A Justification Letter** and confirmation of all required laboratory data within the specified timeframe.

4.6.2 Priority Status 1B – High Urgency (Pediatric Only):

4.6.2.1 Shall be assigned to candidates below 18 years of age who are critically ill but not meeting Status 1A criteria, and who demonstrate severe complications of chronic liver disease, certain metabolic disorders, or biopsy-proven hepatoblastoma without metastatic spread.

4.6.2.2 Assignment requires submission of a **Liver Status 1B Justification Letter** and documentation of all qualifying criteria.

4.6.3 MELD and PELD Scoring System:

4.6.3.1 Liver transplant candidates not qualifying for Status 1A or 1B shall be prioritized according to a calculated score that estimates three-month mortality risk:

4.6.3.1.1 MELD-Na (Model for End-Stage Liver Disease - Sodium) for adult candidates (≥12 years).

4.6.3.1.2 PELD (Pediatric End-Stage Liver Disease) for pediatric candidates (<12years). **Table 3: PELD Score Calculation.**

4.6.3.1.3 Scores are derived from the most recent validated laboratory results in the ATHAR system, including bilirubin, INR, creatinine, serum sodium, and albumin or growth failure indicators for

pediatric candidates.

4.6.3.2 Exception MELD and PELD Scores: A candidate may be assigned an **exception score** when the calculated MELD or PELD does not accurately reflect the severity of illness. Exception requests shall be supported by clinical documentation and approved through the **SCOT Liver Transplantation Subcommitte.** **Table 4: Conditions For Exception MELD and PELD Score.**

4.6.4 Combined Liver–Intestine Candidates:

4.6.4.1 Candidates who are actively registered for both liver and intestine transplantation shall receive an adjustment to their priority score to reflect increased medical urgency:

4.6.4.1.1 Adult candidates (≥18 years): additional points equivalent to a 10% increase in 3-month mortality risk.

4.6.4.1.2 Pediatric candidates (<18 years): +23 points added to the calculated PELD score.

4.6.4.2 The transplant hospital must document the medical justification for the combined transplant and confirm that the combined procedure was completed.

4.6.5 Inactive Status

4.6.5.1 Candidates may be temporarily classified as **Inactive** when they are medically or administratively ineligible for transplantation (e.g., active infection, ongoing evaluation, or temporary deferral).

4.6.5.2 Inactive candidates remain on the waiting list but are excluded from organ offers until reactivated by the transplant program.

4.7 **Compatibility: (Allocation of liver by Blood Type):**

4.7.1 Liver grafts shall be allocated on an ABO-identical basis for adult recipients. In exceptional circumstances, ABO-compatible allocation will automatically be accepted for candidates with status 1a/1b. ABO-compatible allocation may be accepted for pediatric recipients or adults with MELD-Na/PELD ≥30, where urgency precludes waiting for an identical match. Such cases must be clinically justified, approved by SCOT Liver Transplantation Subcommittee.

4.7.2 Liver grafts from pediatric donors (<18 years of age) will be allocated to pediatric candidates (<18 years of age), unless there is a status 1a active case or the liver is not accepted for pediatric candidates by any center.

4.8 **Waiting Time:** All liver transplant candidates registered on the waiting list shall accrue waiting time within their current status (1A or 1B) or MELD/PELD score tier, in accordance with the chronological order of listing and medical urgency.

4.8.1 Waiting Time for Priority Statuses (1A and 1B)

4.8.1.1 Candidates assigned Status 1A or 1B shall accrue waiting time from the date and time that the Liver Status 1A or 1B Justification Form is first submitted and accepted through the ATHAR allocation system.

4.8.1.2 Waiting time shall continue to accrue only while the candidate remains active in that status.

4.8.1.3 In cases where a candidate transitions between statuses (e.g., from 1B to 1A), waiting time shall be recalculated based on the effective date of the new justification form.

4.8.2 Waiting Time for MELD and PELD Candidates

4.8.2.1 Candidates whose priority is based on a calculated MELD or PELD score will continue to build waiting time at their current score or any higher score previously assigned. This includes any additional points awarded for combined liver–intestine registration.

4.8.2.2 Waiting time for such candidates includes:

4.8.2.2.1 Time accrued at the **current calculated MELD or PELD score**, including liver–intestine points.

4.8.2.2.2 Any **previous time** accrued at the **same score** during earlier listing periods.

4.8.2.2.3 Any **previous time** accrued at a **higher calculated score**, including liver–intestine points.

4.8.2.2.4 Any **previous time** accrued while the candidate was listed as **Status 1A or 1B**.

4.8.3 Candidates with an **exception MELD or PELD score** will begin accumulating waiting time **from the date the exception request was first approved or assigned**, even if the candidate later becomes temporarily inactive, as long as the exception remains valid.

4.8.4 Candidates listed for a **combined liver–intestine transplant** may include any waiting time previously accrued while they were listed for an isolated intestinal transplant, once it is confirmed that both organs are medically required.

4.8.5 **Laboratory Value Update:** All transplant hospitals shall ensure that each registered liver candidate's laboratory values and status are updated in accordance with the schedule defined in **Table 5: Laboratory Value Update Schedule.**

4.9 **Organ Utilization:** To maximize organ utilization, factors such as the organ's suitability for transplantation, the likelihood of a successful outcome, the proximity and transportation feasibility between the donor and potential recipients must be taken into consideration during liver allocation (Shorter Cold ischemia time (CIT)).

4.9.1 To increase organ utilization, Split liver transplantation may be considered only when the donor meets all the eligibility criteria outlined in Table 6. These include donor under 40 years of age, receiving a single vasopressor or less, having transaminase levels not exceeding three times the normal limit, and a body mass index (BMI) of 28 or less **(see Table 6: Split Liver Donor Eligibility Criteria).**

4.9.2 Priority for a splittable liver will be assigned to **pediatric candidates**, provided that there are **no active Status 1A/1B cases** or **candidates with MELD ≥ 30** on the waiting list.

4.9.3 The **transplant center** performing the split can utilize the **remaining liver segment** for another suitable recipient within their waiting list

4.9.4 If the center elects not to use the remaining segment, SCOT must be immediately notified, who will assume responsibility for offering and allocating the remaining segment to other transplant centers in accordance with the national liver allocation policy.

4.9.5 If the liver is found not to be splittable for anatomical concerns or another reason, SCOT must be immediately notified, who will assume responsibility for offering and reallocating the liver in accordance with the national liver allocation policy.

4.10 **Any othe exceptional cases will be evaluated individually by SCOT Liver Transplantation Sub-committee, which will convene as needed when an exceptional case arises prior to the allocation process.**

4.11 Once the liver is allocated, SCOT will not permit any changes to the liver allocation. However, SCOT retains the authority to withdraw the offer if the allocation is found to be in violation of the rules established in this policy.

4.12 SCOT coordinator in charge shall ensure that all correspondence, including emails, letters, and other forms of communication are documented promptly and accurately with the dates & times.

4.13 All documentation shall be handled in accordance with applicable privacy and data protection laws and regulations.

4.14 Access to allocation documentation shall be limited to authorized personnel involved in the organ allocation process, and all documentation shall be handled in accordance with applicable privacy and data protection laws and regulations. Refer to data sharing and privacy policy.

4.15 The allocation policy shall be reviewed periodically to ensure its effectiveness, relevance, and alignment with SCOT regulatory requirements. Any necessary revisions or updates shall be made in a timely manner.

5. PROCEDURE

5.1 SCOT commences the allocation process, within 1 hour after obtaining consent for organ donation.

5.2 SCOT coordinator shall request post consent donor workup from donor hospitals for the liver. Refer to **Table7: Routine Donor Workup**

5.3 SCOT coordinator shall promptly review the case details, ensure data completion and diligently assess the viability of the liver based on the established criteria. **Table 1: Liver Acceptance Criteria**

5.4 Following the viability assessment, SCOT coordinator shall allocate the liver according to the allocation attributes outlined in this policy.

5.5 SCOT coordinator shall allocate the liver to the primary recipient and backup recipients simultaneously. The final allocation plan must receive approval from the head of the Waiting List Management and Organ Allocation section at SCOT

5.6 SCOT coordinator shall promptly contact the coordinator at the patient's transplant center to make the Liver offer and provide all relevant donor information.

5.7 The transplant center has a maximum of 1 hour to initially accept the offer, during this period, the transplant center may request further investigations.

5.8 SCOT coordinator shall ensure that all necessary workups are done and submitted to the accepting transplant center effectively.

5.9 Any new data obtained during the workup process shall be promptly submitted to the initially accepting center.

5.10 Once the transplant center receives all necessary/requested data about the donor, they must provide a final acceptance or rejection within 1 hour using **Organ and Tissue Acceptance/Rejection form**

5.11 Failure to respond within 1 hour will exclude the center from the allocation of that liver and will be considered as refusal.

5.12 In case of rejection, the transplant center must provide a valid reason for the rejection using **Organ and Tissue Acceptance/Rejection form.**

5.13 The reason for rejection by the initially accepting center must be shared with the backup centers, informing the next backup center that they have become the primary center for the liver.

5.14 During liver recovery, the primary transplant center may reject the liver based on macroscopic and/or microscopic examination.

5.14.1 The primary transplant center must complete the *Organ and Tissue Acceptance/Rejection form* and send it to SCOT.

5.14.2 SCOT coordinator shall inform the backup transplant center of the rejection and the reason behind it.

5.15 The surgeon who recovered the liver shall fill the **Deceased donor Lliver recovery report**.

5.16 If the liver is not accepted by any transplant center due to unsuitability for transplantation, the transplant center coordinator must fill the **Deceased Organ Discard Report** according to SCOT's *Disposal of Discarded Human Organ/Tissue Policy.*

5.17 If the liver is transplanted, the transplant center shall complete the **Post Organ Transplantation Form** within 24 hours of the transplantation date.

5.18 SCOT coordinator responsible for allocation shall document the entire allocation process using *Organ Allocation Form.*

5.19 The liver allocation process is considered concluded once the liver has been successfully transplanted to the recipient.

6. RESPONSIBILITY

6.1 The responsibility of implementing and ensuring compliance with the developed Policy and Procedure lies with Donor Affairs & Organ Allocation Department.

7. SYNOPSIS OF CHANGE

New

8. APPENDICES

9. References:

9.1 OPTN, "Organ Procurement and Transplantation Network (OPTN) Policies." Jan. 10, 2025. [Online]. Available: https://optn.transplant.hrsa.gov/media/eavh5bf3/optn_policies.pdf
9.2 SCOT, "Directory of Organ Donation and Transplantation Procedures in the Kingdom of Saudi Arabia." 2025. [Online]. Available: www.SCOT.gov.sa
9.3 Saudi Center for Organ Transplantation (SCOT) – Liver Transplant Sub-committee.
9.4 American Association for the Study of Liver Diseases (AASLD). Acute Liver Failure: Update 2011. Hepatology. 2011;55(3):965– 967. Available at: https://www.aasld.org/sites/default/files/2023-03/Acute%20Liver%20Failure%20Update2011.pdf
9.5 Eurotransplant Manual. Liver Allocation – High-Urgency Indications (Update July 2025). https://www.eurotransplant.org/allocation/eurotransplant-manual

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APPENDIXES

10. Liver Transplantation Scientific Committee:
Dr. Adel Al-Qutb (Chairman): Transplant Hepatologist - King Fahad Medical City, Riyadh
Dr. Mohammed Shaheen (Vice-Chairman): Multi-visceral Transplant surgeon King Abdulaziz Medical City and National Guard Hospital, Riyadh
Dr. Saleh Al-Abbad: Multi-organ transplant and hepatobiliary pancreatic surgeon King Faisal Specialist Hospital & Research Centre, Riyadh
Dr. Mohammed Al-Qahtani: Consultant HPB & Transplant Surgeon -King Fahad Specialist Hospital, Dammam
Dr. Nasser M. Al-Masri: Consultant of Hepatology and Transplantation - Prince Sultan Military Medical City, Riyadh
Dr. Ali Alyami: Consultant Multi organ Transplant Surgeon -Prince Sultan Military Medical City, Riyadh
Dr. Mohammed Al Jawad: Consultant of Hepatology and Transplantation - King Fahad Specialist Hospital, Dammam
Dr. Hamad M Al-Bahili: Consultant Multi organ Transplant Surgeon - Prince Sultan Military Medical City, Riyadh
Dr. Razan Bader: Pediatrics Transplant hepatologist - Eastern Health - King Fahad Specialist Hospital, Dammam
Dr. Khalid Saad: Consultant Multiorgan transplant surgeon - King Faisal Specialist Hospital & Research Centre, Riyadh
Dr. Khalid Alharbi: Transplant Hepatology Consultant- King Abdulaziz Medical City and National Guard Hospital, Riyadh

Table 1: Liver Acceptance Criteria

The Liver of the deceased's donor are considered valid for donation except in the following cases:

- Cirrhosis
- Portal hypertension
- Macro steatosis greater than or equal to 50% or fibrosis greater than or equal to stage II
- Fulminant hepatic failure

Discuss with transplant centers or request more investigation in the following cases:

- HCV positive donors as they could be considered in HCV positive recipients
- Age over 60 years
- Terminal AST/ALT greater than 700 U/L

Table 2: Liver Priority Criteria

Status / Scoring Category	Adult Candidates (≥ 18 years)	Pediatric Candidates (< 18 years)
Status 1A The transplant hospital must submit **a Liver Status 1A Letter Form** to SCOT.	**The candidate's transplant program may assign the candidate adult status 1A if all the following conditions are met:** 1. **The candidate is at least 18 years old at the time of registration.** 2. **The candidate has a life expectancy without a liver transplant of less than 7 days and has at least one of the following conditions:** a. **Fulminant liver failure** (encephalopathy ≤ 56 days of the first signs or symptoms of liver disease), In addition, the candidate: i. Must not have a pre-existing diagnosis of liver disease. ii. Must currently be admitted in the intensive care unit iii. Must meet at least one of the following conditions: 1. Is ventilator dependent 2. Requires dialysis, continuous veno-venous hemofiltration (CVVH), or continuous veno-venous hemodialysis (CVVHD) 3. Has an international normalized ratio (INR) greater than 2.0 b. **Anhepatic.** c. **Primary non-function of a transplanted liver within 7 days of transplant, evidenced by at least two of the following:** i. Alanine aminotransferase (ALT) greater than or equal to 2,000 U/L ii. INR greater than or equal to 2.5 iii. Total bilirubin greater than or equal to 10 mg/dL iv. Acidosis, defined as one of the following: v. Arterial pH less than or equal to 7.30 vi. Venous pH less than or equal to 7.25 vii. Lactate greater than or equal to 4 mmol/L *All laboratory results reported for the tests required above must be from the same blood draw taken 24 hours to 7 days after the transplant.* d. **Non-function within 7-days of transplant of a transplanted liver segment** from a deceased or living donor, evidenced by at least one of the following: • INR greater than or equal to 2.5 • Arterial pH less than or equal to 7.30 • Venous pH less than or equal to 7.25 • Lactate greater than or equal to 4 mmol/L e. **Hepatic artery thrombosis (HAT)** within 7-days of transplant, with AST greater than or equal to 3,000 U/L and at least one of the following: • INR greater than or equal to 2.5 • Arterial pH less than or equal to 7.30 • Venous pH less than or equal to 7.25	**The candidate's transplant program may assign the candidate pediatric status 1A if all the following conditions are met:** 1. **The candidate is < 18 years old at the time of registration. This includes candidates less than 18 years old at the time of registration, who remain on the waiting list after turning 18 years old, but does not include candidates removed from the waiting list at any time who then return to the waiting list after turning 18 years old.** 2. **The candidate has at least one of the following conditions:** a. **Fulminant liver failure and the candidate:** i. Must not have a pre-existing diagnosis of liver disease. ii. Must meet at least one of the following criteria: 1. Is ventilator dependent 2. Requires dialysis, continuous veno-venous hemofiltration (CVVH), or continuous veno-venous hemodialysis (CVVHD) 3. Has an international normalized ratio (INR) ≥2.0 or ≥1.5 and and a diagnosis of hepatic encephalopathy within 56 days of the first signs or symptoms of liver disease 4. Has an INR greater than or equal to 2.0 b. **Diagnosis of primary non-function of a transplanted liver within 7 days of transplant, evidenced by at least two of the following:** viii. Alanine aminotransferase (ALT) greater than or equal to 2,000 U/L ix. INR greater than or equal to 2.5 x. Total bilirubin greater than or equal to 10 mg/dL xi. Acidosis, defined as one of the following: • Arterial pH less than or equal to 7.30 • Venous pH less than or equal to 7.25 • Lactate greater than or equal to 4 mmol/L *All laboratory results reported for any tests required for the primary non-function of a transplanted liver diagnosis above must be from the same blood draw taken between 24 hours and 7 days after the transplant.* c. **Diagnosis of hepatic artery thrombosis (HAT)** in a transplanted liver within 14 days of transplant ❖ Hepatic artery thrombosis within 30 days of transplant that do NOT fulfill the above-mentioned criteria will be granted exception points (40). d. **Acute decompensated Wilson's disease**

	• Lactate greater than or equal to 4 mmol/L ❖ Hepatic artery thrombosis within 30 days of transplant that do NOT fulfill the above-mentioned criteria will be granted exception points (40). *All laboratory results reported for the tests required above must be from the same blood draw taken 24 hours to 7 days after the transplant.* f. **Acute decompensated Wilson's disease.**	
	Pediatric Candidates (< 18 years)	
Status 1B The transplant hospital must submit **a Liver Status 1B Justification Letter** to SCOT.	**The candidate's transplant program may assign the candidate pediatric status 1B if all the following conditions are met:** 1. **The candidate is < 18 years old at the time of registration. This includes candidates less than 18 years old at the time of registration, who remain on the waiting list after turning 18 years old, but does not include candidates removed from the waiting list at any time who then return to the waiting list after turning 18 years old.** 2. **The candidate has one of the following conditions:** a. The candidate has an organic acidemia or urea cycle defect and an approved MELD or PELD exception meeting standard criteria for metabolic disease for at least 30 days. b. **Chronic liver disease** and meets at least one of the following criteria due to complications of chronic liver disease: i. Is on a mechanical ventilator ii. Has gastrointestinal bleeding requiring red blood cell replacement of at least 30 mL/kg within the previous 96 hours or 20 mL/kg within the previous 24 hours iii. Has renal failure or renal insufficiency requiring dialysis, continuous veno-venous hemofiltration (CVVH), or continuous veno-venous hemodialysis (CVVHD). c. **Hepatoblastoma** if all the following conditions are met: i. The candidate is < 18 years at the time of registration. ii. The diagnosis of hepatoblastoma is confirmed by liver biopsy. iii. The patient is deemed suitable for liver transplantation following appropriate chemotherapeutic management. iv. There is no evidence of vital extrahepatic metastases. d. **Chronic liver disease and is a combined liver-intestine candidate** and meets at least one of the following criteria due to complications of chronic liver disease: i. Is on a mechanical ventilator ii. Has gastrointestinal bleeding requiring at least 10 mL/kg of red blood cell replacement within the previous 24 hours iii. Has renal failure or renal insufficiency requiring dialysis, continuous veno-venous hemofiltration (CVVH), or continuous veno-venous hemodialysis (CVVHD).	
	Adult Candidates (≥ 18 years)	**Pediatric Candidates (< 18 years)**
MELD / PELD Score	**MELD** used for candidates ≥ 12 years (not Status 1A). ▪ **Candidates who are at least 18 years old at the time of registration receive a MELD score equal to:** • MELD = 1.33 (if female) + [4.56 x loge(bilirubin)] + [0.82 x (137-sodium)] – [0.24 x (137-sodium) x loge(bilirubin)] + [9.09 x loge(INR)] + [11.14 x loge(creatinine)] + [1.85 x (3.5-albumin)] – [1.83 x (3.5 – albumin) x loge(creatinine)] + 6 ▪ **Candidates who are currently at least 12 years old and were less than 18 years old at the time of registration receive a MELD score equal to:** • MELD = [4.56 x loge(bilirubin)] + [0.82 x (137-sodium)] – [0.24 x (137-sodium) x loge(bilirubin)] + [9.09 x loge(INR)] + [11.14 x loge(creatinine)] + [1.85 x (3.5-albumin)] – [1.83 x (3.5 – albumin) x loge(creatinine)] + 7.33	**PELD** used for candidates < 12 years (not Status 1A/1B). Candidates who are under the age of 12 receive a PELD score equal to: See *Table 3: PELD Score Calculation* ▪ **A candidate's PELD score will then be calculated as follows:** • PELD = (sum of all terms as outlined in Table 9-1: PELD Score Calculation + 1.5287) x 10 + 2.82 ▪ The minimum of Center for Disease Control and Prevention's (CDC) height or weight Z-score uses the lambda-mu-alpha (LMS) method and is based on the 2000 CDC Growth Charts for the United States. ▪ The calculation uses the candidate's birth sex, most recent values submitted for height and weight, and the candidate's age in months at the time the height and weight values used in the PELD calculation were measured.

	▪ Bilirubin, INR, and creatinine values less than 1.0 will be set to 1.0 when calculating a candidate's MELD score. ▪ **The following candidates will receive a creatinine value of 3.0 mg/dL when calculating a candidate's MELD score:** • Candidates with a creatinine value greater than 3.0 mg/dL • Candidates who received two or more dialysis treatments within the 7 days prior to the serum creatinine test • Candidates who received 24 hours of continuous veno-venous hemodialysis (CVVHD) within the 7 days prior to the serum creatinine test ▪ Sodium values less than 125 mmol/L will be set to 125 mmol/L, and values greater than 137 mmol/L will be set to 137 mmol/L. ▪ Albumin values less than 1.5 g/dL will be set to 1.5 g/dL, and values greater than 3.5 g/dL will be set to 3.5 g/dL. ▪ The minimum MELD score is 6. The maximum MELD score is 40. The MELD score derived from this calculation will be rounded to the nearest whole number.	▪ Albumin, bilirubin, and INR values less than 1.0 will be set to 1.0 when calculating a candidate's PELD score. ▪ **The following candidates will receive a creatinine value of 1.3 mg/dL when calculating a candidate's PELD score:** • Candidates with a creatinine value greater than 1.3 mg/dL • Candidates who received two or more dialysis treatments within the 7 days prior to the serum creatinine test • Candidates who received 24 hours of continuous veno-venous hemodialysis (CVVHD) within the 7 days prior to the serum creatinine test ▪ The minimum PELD score is 6. The PELD score derived from this calculation will be rounded to the nearest whole number.
Liver–Intestine Candidates	- Candidates ≥ 18 years who are actively listed for both liver and intestine at the same transplant hospital receive an additional increase equivalent to a 10-percentage-point rise in 3-month mortality risk. - Transplant hospital mus - t document medical justification for the combined transplant and confirm completion in the medical record.	- Candidates < 18 years who are actively listed for both liver and intestine at the same transplant hospital receive + 23 points added to their calculated PELD score. - Transplant hospital must document medical justification and confirm that the combined transplant was performed.

Table 3: PELD Score Calculation

Variable	If the value is …	Then the value's contribution to PELD is …
Candidate Age (fractional calendar year)	< 1	−0.1967 × 1
	1 to 5.5	−0.1967 × (age at the time of the most recent lab reported for use in the PELD score)
	> 5.5 and < 12	−0.1967 × 5.5
Albumin (g/dL)	1 to 1.9	−1.842 × ln(albumin)
	> 1.9	−1.842 × ln(1.9)
Total bilirubin (mg/dL)	1 to 4	0.7854 × ln(bilirubin) + 0.3434 × ln(4)
	> 4 to 40	0.7854 × ln(4) + 0.3434 × ln(bilirubin)
	> 40	0.7854 × ln(4) + 0.3434 × ln(40)
INR	1 to 2	1.981 × ln(INR) + 0.7298 × ln(2)
	> 2 to 10	1.981 × ln(2) + 0.7298 × ln(INR)
	> 10	1.981 × ln(2) + 0.7298 × ln(10)

Table 3: PELD Score Calculation

Variable	If the value is …	Then the value's contribution to PELD is …
Minimum of CDC height or weight Z-score	< −5.0	−0.1807 × (−5)
	−5.0 to −2.1	−0.1807 × (minimum Z-score)
	> −2.1	−0.1807 × (−2.1)
Creatinine (mg/dL)	< 0.2	1.453 × ln(0.02)
	0.2 to 1.3	1.453 × ln(creatinine)
	> 1.3	1.453 × ln(1.3)

Table 4: Conditions For Exception MELD and PELD Score:

Exceptional Conditions	Eligibility Criteria	Update Schedule	Exception points
Hepatocellular carcinoma	a. Histological diagnosis of Hepatocellular Carcinoma (HCC) or LIRADS5 confirmation by CT or MRI. b. Tumor stage:The candidate's hepatic lesions must meet one of the following definitions: ▪ One LIRADS5 or biopsy-proven HCC measuring ≥2 cm and ≤5 cm in diameter; or ▪ Two or three LIRADS5 or biopsy-proven HCCs each measuring ≥ 1 cm and ≤ 3 cm in diameter. c. AFP (Alpha-Fetoprotein): AFP must be <1,000 ng/mL at the time of request. *The abovementioned measurements refer to the diameter of the lesions, not to their viable component at the time of assessment.	Repeated axial imaging and AFP every 6 months to confirm that the tumor remains within criteria.	**3 points** below median MELD-Na at transplant in the Kingdom, exception applicable 6 months after listing, no score progression.
Hilar cholangiocarcinoma	1. Biopsy or cytology results confirming malignancy OR dominant biliary stricture with at least one of the following: carbohydrate antigen 19-9 greater than 100 U/mL in absence of cholangitis; aneuploidy (FISH), and hilar mass, which is less than 3 cm in radial diameter. 2. Unresectable tumors	Repeated axial imaging every 3 months to confirm no metastatic spread.	**3 points** below median MELD-Na at transplant in the Kingdom, no score progression.

	3. No metastatic spread (including intrahepatic and lymphatic) 4. No history of transperitoneal biopsy 5. Completion of appropriated neoadjuvant radiotherapy		
Familial Amyloid Polyneuropathy	1. Candidate is also registered and active on the waiting list for a heart transplant at that transplant hospital, or has an echocardiogram performed within 30 days prior to submission of the initial exception request showing the candidate has an ejection fraction greater than 40 percent. 2. Candidate can walk without assistance. 3. Transthyretin (TTR) gene mutation has been confirmed. 4. Biopsy-proven amyloid.	Echocardiogram or other imaging study showing ejection fraction greater than 40 percent every 4 months.	**3 points** below median MELD-Na at transplant in the Kingdom, no score progression.
Hepatic Artery Thrombosis	Recipients that do not fulfill status 1a criteria and have documented thrombosis within 30 days of transplantation		40 points
Hepatopulmonary syndrome	1. Ascites, varices, splenomegaly, or thrombocytopenia. 2. An intrapulmonary shunt, shown by either contrast echocardiogram or lung scan. 3. PaO_2 <60 mmHg on room air within **30 days** prior to submission of the initial exception request. 4. No clinically significant underlying primary pulmonary disease. 5. Continuous Ambulatory Oxygen Therapy	Provide proof of PaO2 <60 mmHg on room air every 3 months	**3 points** below median MELD-Na at transplant in the Kingdom, no score progression.
Portopulmonary hypertension	Documentation of portal hypertension at the time of initial exception AND: 1. Right heart catheterization initial mean pulmonary arterial pressure (MPAP) ≥35 mmHg and initial pulmonary vascular resistance (PVR) level ≥240 dynes*sec/cm^5 (or ≥3 Wood units (WU)). These values must be from the same test date. 2. Other causes of pulmonary hypertension have been assessed and	Right hearth catheterization **every 6 months** showing: a. MPAP <35 mmHg and PVR <400 dynes*sec/cm^5 (or <5 Wood units (WU)). b. MPAP ≥35 mmHg and <45 mmHg and PVR	**3 points** below median MELD-Na at transplant in the Kingdom, no score progression.

	determined to not be a significant contributing factor 3. Initial transpulmonary gradient to correct for volume overload 4. Documentation of treatment 5. Document via heart catheterization within 90 days prior to submission of the initial exception either of the following: • Post-treatment MPAP <35 mmHg and post-treatment PVR <400 dynes*sec/cm^5 (or <5 Wood units (WU)). • Post-treatment MPAP ≥35 mmHg but <45 mmHg and post-treatment PVR <240 dynes*sec/cm^5 (or <3 Wood units (WU)). These values must be from the same test date.	<240 dynes*sec/cm^5 (or <3 Wood units (WU)). *These values must be from the same test date.	
Primary Hyperoxaluria	1. Candidate is also registered on the waiting list for a kidney transplant at that transplant hospital 2. Alanine glyoxylate aminotransferase (AGT) deficiency proven by liver biopsy using sample analysis or genetic analysis	None	**3 points** below median MELD-Na at transplant in the Kingdom, no score progression.

Table 5: Laboratory Value Update Schedule

If the candidate is:	The new laboratory values must be reported every:	And when reported, the new laboratory values must be no older than:
Status 1A or 1B	7 days	2 days
MELD 25 or greater (ages 18 or older)	7 days	2 days
MELD or PELD 25 or greater (less than 18 years old)	14 days	3 days
MELD or PELD 19 to 24	30 days	7 days
MELD or PELD 11 to 18	90 days	14 days
MELD or PELD 10 or less	365 days	30 days

Table 6: Split Liver Donor Eligibility Criteria

Requirement
Donor is **less than 40 years old**
Donor is on **a single vasopressor or less**
Transaminases (AST/ALT) **no greater than three times** the normal level
Body Mass Index (BMI) of **28 or less**

Table 7: Routine workups to all donors by organ/tissue

Organ / Tissue	Tests
All donors	Blood, urine, and throat cultures; serology; blood type; liver enzymes; electrolytes; CBC; blood gases; HLA (only after consent); MRSA surveillance (groin, axilla, nasal)
Lung	Challenge test; chest X-ray; CT (lung windows); bronchoscopy; TB PCR (tracheal aspirate); pneumonia panel; COVID-19 test
Heart	Cardiac Cath; Echo; ECG
Liver	Liver function tests with bilirubin; coagulation profile; GGT; albumin; abdominal US/CT
Kidney	kidney function tests; electrolytes; US/CT Abdomen; Total intake/output
Pancreas	Amylase; lipase; HbA1c; abdominal US/CT
Intestine	Abdominal girth; amylase; lipase
Cornea	Serology (especially HBc antibodies)

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Organ and Tissue Acceptance/ Rejection

Donor Demographics

Name:		SCOT Case No.:	#
Hospital:		Coordinator:	
Offer Date/Time:	#		

Organ:

☐ Kidney	☐ Liver	☐ Heart	☐ Lungs
☐ Pancreas	☐ Small Bowel	☐ Corneas	☐ Bones

☐ **Accepted**	☐ **Rejected**
	Kindly indicate the reason:
Date/Time:	Date/Time:

The transplant center shall complete the organ transplantation form promptly after the organ transplantation within 24 hours of the transplantation date

Information Provider

Transplant Center:			
Consultant:		Signature:	
Transplant Coordinator:		Signature:	
		Date/time:	

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FORM-OSC-007

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Deceased Organ Discard Report

Donor Demographics

Hospital:			
Name:		SCOT Case No.:	#
Age:	#	Date/Time:	
Nationality:		Blood Group:	

Discarded Organ:

- ☐ Kidney
- ☐ Liver
- ☐ Heart
- ☐ Lungs
- ☐ Pancreas
- ☐ Small Bowel
- ☐ Corneas
- ☐ Bones

*Use a different form if you would like to report more than one organ for disposal

Transplant Center:	
Received date & time:	

Reason of Disposal

Reason organ harvested not used for transplantation

- ☐ Result of Perfusion Pump
- ☐ Long Cold Ischemia Time
- ☐ Vascular damage
- ☐ Ureteral damage
- ☐ Inadequate urine output
- ☐ Positive CMV
- ☐ Positive HIV
- ☐ Positive hepatitis
- ☐ Warm ischemic time too long
- ☐ Organ trauma
- ☐ Organ not as described
- ☐ Biopsy findings
- ☐ Recipient determined to be unsuitable for transplant in Operating room
- ☐ Poor organ function
- ☐ Infection
- ☐ Diseased organ
- ☐ Anatomical abnormalities
- ☐ No recipient located - listed exhausted
- ☐ Other, specify:

Disposal Method: ☐ Pathology ☐ Research

Information Provider

Coordinator Name:		Signature:	
Position:		Date/time:	
Transplant Center:			

In accordance with Articles 9 and 10 of the Human Organ Donation Regulation and Executive Bylaw, all medical examination and scientific research conducted on donated organs must adhere to Islamic principles and be done only with the informed consent of the donor. The dignity and confidentiality of the organ donor, whether living or deceased, shall be respected at all times during organ recovery and transplantation procedures. Any disclosure of medical information related to the donor's body is prohibited except when legally required or ordered by a judicial authority. All parties involved in organ donation, procurement, and transplantation procedures must uphold these principles outlined in Articles 9 and 10.

Deceased Liver Recovery Report

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SCOT

Donor info

Hospital
Name | SCOT Case No. #
Age # | Blood Group
Nationality | OR recovery Date/Time

Skin Incision Date/Time
Cross Clamp Date/Time
Vital signs BP Temp HR CVP

Alcohol History ○ Yes ○ No Duration
Cardiac Arrest ○ Yes ○ No Duration

AST	ALT	GGT	T.Bili	Na	ALP	Hight	weight	BMI

+ve Serology
+ve Culture

○ CT ○ US Hepatic Steatosis ○ Yes ○ No %
Bx ○ Yes ○ No

Report
Report

Surgeon

Hepatic shape, size and color ○ Normal ○ Abnormal
○ Whole ○ Left Lobe ○ Right Lobe ○ Reduced Size
Note

Abnormalities

○ Biliary duct dilatation Note
○ Thrombosis Note
○ Venous issue Note
○ Permeability defect Note
○ Arterial issue Note
○ Other Note

Transplant Center Coordinator

Organ prefusion

Type of fluid ○ HTK ○ UW ○ other (specify) | Volume of fluid L

Prefusion Quality during recovery
○ Homogeneous ○ Dark Blue
○ Marbled

Prefusion Quality Prior to Tx surgery
○ Normal ○ None
○ Reduced

Consistency
○ Normal ○ Tense
○ Indured

prefusion machine ○ Yes ○ No | Pressure | Flow | Resistance | Temperature

Note

Surgeon

Final Decision

○ Accepted ○ Rejected ○ Pending (specify)

Rejected
○ Fatty liver ○ poor prefusion ○ Prolonged ischemia time ○ Bx findings (specify)
○ infection ○ Vascular ○ fibrosis ○ cirrhosis ○ other (specify)

Transplant Surgeon Name | Signature | Date/Time

SCOT

SCOT Coordinator Name | Signature | Date/Time

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Saudi Center for Organ Transplantation

Post Liver Transplantation Follow-up

(Recipient)

Name of Transplant Center	Recipient MRN

Liver Recipient Demographics

Recipient Name:			
Date of Birth:		Age:	
Original Disease:		Sex:	
Nationality:		National ID:	#

Transplantation Details

Date of Transplant:

Part of Liver: ☐ Left lobe ☐ Right lobe ☐ Left Lateral Segment

Type of Transplant: ☐ Domino ☐ Deceased ☐ Whole ☐ Split ☐ Living ☐ Direct ☐ Indirect

Note: Date should be linked to donor information

Post-Transplantation Status

Recipient Status:
- ☐ Alive with functioning graft
- ☐ Alive with failed graft
- ☐ Dead with functioning graft
- ☐ Dead with failed graft

Non-functioning graft: ☐ Yes Date: ☐ No

Graft loss: ☐ Yes ☐ No
Date:
Cause:

Death: ☐ Inside Hospital ☐ Outside
Date:
Cause:

Lost Follow-up Reasons: ☐ Routine ☐ Emergency ☐ Other:

Latest Lab Values (Required)

AST	ALT	GGT	INR

Either of the following:
- 30 days after the discharge from transplant center for transplantation and annual anniversary of the transplant date until the recipient's death or graft failure
- 14 days from notification of the recipient's death or graft failure

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