ZTCC Mumbai Liver Guidelines

Liver Sub-committee (LSC)

- The LSC is an advisory group to ZTCC Mumbai for:
    - Establishing, discussing, defining and circulating protocols for registering / listing patients for liver transplant, maintaining the waiting lists and appropriate allocation of available livers (LSC – 30th November 2004) (LSC – 26th April 2005)
    - Increasing awareness about liver transplant (LSC – 30th November 2004)
- LSC is constituted by:
    - One transplant physician and one surgeon each representing every liver transplant centre registered with the office of the Director of Health Service (DHS) Mumbai (LSC – 30th November 2004)
    - Invited / nominated experts
    - Two transplant coordinators from the ZTCC transplant coordinators group (EC – 8th March 2014)
    - Any additional transplant coordinators may be invited to LSC meetings for discussion on specific cases (EC – 8th March 2014)
    - Chairperson and Co-chairperson may be nominated or elected (13th August 2016), current office holders being:
        - Dr. Ravi Mohanka
        - Dr. Parijat Gupte
- A 5-member **expert group** is nominated by LSC (22nd December 2018):
    - Functions of the expert group
        - Review and approval of cases for super-urgent listing
        - Review and approval of cases for granting exception points
        - Screening of applications forms of HCC / alcoholic liver disease patients for their eligibility
        - Any other tasks assigned by the LSC
    - Current members of the expert group are:
        - Dr. Aabha Nagral
        - Dr. Gaurav Chaubal
        - Dr. Gaurav Gupta
        - Dr. Pravin Agrawal
        - Dr. Somnath Chattopadhyay
    - Any 3 members vote constitutes a majority decision and implemented, unless an objection is raised

Definitions

- **Liver transplant centre:** A centre registered for liver transplant with DHS Mumbai
- **Non-Transplant Organ Retrieval entre (NTORC):** A centre registered with DHS for organ retrieval for transplant
- **"In-house" liver:** Liver donated at a registered liver transplant centre
- **"In-house" patients / list:** list of patients on the waiting list at a registered liver transplant centre
- **City liver:** Any liver donated:
    - at a registered liver transplant centre but not used "in-house" by them for their "in-house" patients / list
    - at a registered transplant centre not doing liver transplants
    - at a NTORC
    - imported from outside ZTCC Mumbai
- **City list:** list of all patients on the ZTCC waiting list for a liver transplant
- **Extended Criteria Donor (ECD)** for liver: any donor / liver meeting the following criteria (LSC - 22nd December 2018) (LSC - 31st August 2019):
    - Macrosteatosis > 30%
    - Age > 70 years
    - High Ionotropes (Single ionotrope at doses as below or 2 or more ionotropes at any doses)
        - Dopamine > 15 micrograms/kg/min
        - Noradrenaline > 0.3 micrograms/kg/min
        - Adrenaline > 0.3 micrograms/kg/min
        - Vasopressin > 2.4 units/hour
    - Transaminitis (raised AST / ALT)
        - > 10 times ULN
        - > 5 times ULN and rising trend
    - Positive blood culture within last 5 days
    - Anti-HCV, HBsAg, HBcAb, HIV positive
    - Expected Cold Ischemia Time (CIT) > 10 hours
    - Partial / Split graft
    - Last pre-retrieval serum Sodium >165 mEq/L
- **Organ of Critical Importance (OCI):** sequence of organs in order of their importance for multi-organ transplant allocation, as defined by ZTCC Mumbai, as follows:
    - Heart
    - Lungs
    - Intestine
    - Liver
    - Pancreas

- Kidney

Waiting List

ZTCC Mumbai maintains blood-group wise waiting lists for liver transplant patients under the following categories:

- **Super-Urgent waiting list:** includes patients meeting one of the following criteria (LSC - 24th April 2015) (LSC - 6th April 2017)
  - **Donor for living donor liver transplant (LDLT)** with liver insufficiency / failure after donation within the same hospitalization / within 4 weeks of donor surgery
  - **Patients with Acute Liver Failure (ALF) or Fulminant Hepatic Failure (FHF):** Patients with onset of illness within 8 weeks meeting the King's College Criteria are included in this category (including Ratol poisoning), although discussion about using NHS criteria are underway (LSC 30th December 2017) (LSC - 31st August 2019).
  - **Primary Non-Function (PNF)** within 7 days of liver transplant defined as:
    - Aspartate Aminotransferase (AST) / SGOT (Serum Glutamic-Oxaloacetic Transaminase) > 3000 U/L (essential criteria)
    - AND any one of the following criteria:
      - Prothrombin Time (International Normalized Ratio): PT (INR) > 2.5
      - Arterial pH < 7.3
      - Lactate > 4 mmol/L
  - **Anhepatic patient** / Total hepatectomy
  - **Hepatic Artery Thrombosis (HAT)** within 21 days of of implantation with a failed attempt at radiological or surgical re-vascularisation (LSC - 21st December 2016). A HAT patient may remain on the Super-Urgent list for 1 month from the date of transplant, after which the patient will be moved to the Urgent list (below).
  - For patients with the following conditions, applications will be reviewed on case-to-case basis by the expert group, although an attempt is being made to make objective criteria for the same (31st August 2019):
    - Auto-Immune Hepatitis
    - Wilson's Disease
    - Budd-Chiari Syndrome (BCS) (afer failure of radiological intervention) (LSC - 30th December 2017)
    - Reactivation of Hepatitis B viral (HBV) infection
- **Urgent waiting list:** HAT patients are moved from super-urgent to urgent list at one month from date of transplant.
- **Routine waiting list:** all patients for elective liver transplant

- **Pediatric waiting list:** Children ≤ 15 years of age are marked on the Super-Urgent and Routine waiting lists for preferential allotment of livers from pediatric (≤ 15 years old) donors and / or left lobe or left lateral segment of a split liver (14th May 2016) (23rd March 2019).

Registration

- Patients can apply for registration / listing on the deceased donor (cadaveric) liver transplant waiting list through any registered transplant hospital after having been found medically suitable for undergoing the same on pre-transplant evaluation, a review by a multi-disciplinary team (MDT) and submission of registration form through the ZTCC Mumbai App, online on ZTCC Mumbai website or a paper application (Annexure 1) duly signed / approved by the treating hepatologist and liver transplant surgeon (LSC - 21st December 2016) (LSC - 1st January 2011) (21st September 2013) (LSC - 1st March 2014)
- All reports at the time of application should be within 1 week of the application by NABL lab, transplant centre or government hospital
- Patients are also required to accept, sign and submit the ZTCC patient guidelines and abide by them (Annexure 2).
- Patients willing to accept an ECD organ should also submit consent for the same (Annexure XYZ). Without the same, patients will not be offered ECD organs.
- The form should be accompanied by a registration fees as follows (EC / GC / GBM), which may be made online on the ZTCC Mumbai App, ZTCC Mumbai website, through bank transfer or a demand draft, proof of the payment should be attached with the application.:
    - Routine patients: Rs. 5,000 (rupees five thousand)
    - Patients from economically weaker section of the society: Rs. 2,500 (rupees two thousand five thousand) only applicable if the hospital is also treating the patients in the same category
    - Patients registering through government hospitals or indigent patients: Free
- Incomplete applications may be rejected for registration / listing.
- No applications for liver transplant on compassionate basis will be entertained (LSC – 21st December 2016).
- For patients with **Alcoholic Liver Disease (ALD)**, minimum abstinence period of 3 months is required, which has to be declared by the patient, the treating hepatologist and transplant surgeon on the application. In case the patient resumes alcohol abuse while on the waiting list, the transplant team is responsible for informing the ZTCC as soon as it comes to their attention for delisting the patient.
- For patients with **liver cancer / hepato-cellular cancer (HCC)** with LIRADS 5 lesions as seen on a Tri-phasic CT/MRI scan within preceding 1 month can be listed:
    - Tumors within the University of California San Francisco (UCSF) criteria
    - Patients whose tumors have been successfully downstaged to within UCSF criteria

- Applications for **Super-Urgent registration / listing** can be made through the ZTCC Mumbai App, online on ZTCC Mumbai website, by e-mail or by submitting a paper application (Annexure 3). Each application undergoes an urgent review by the expert group. **All replies within 4 hours will be considered for decision making.** Any queries raised by the expert group will need clarification / resolution. Only if the expert group approval and confirmation by the LSC Chairman or Co-chairman, the patient can be listed on the Super-Urgent waiting list. In case of dispute or tie, the Chairman and Co-chairman may make a final decision in consultation with ZTCC Mumbai President and Secretary, which will be final and binding. Once any patient is accepted for Super-Urgent listing, all centres are alerted (LSC – 24th April 2015) (LSC – 21st December 2016).
- For patients requiring **multiple organ transplants**: Application is made on the application form for the organ higher on the OCI list (above). For patients requiring simultaneous liver and kidney transplant, in addition to fulfilling the liver transplant criteria, the patient should have:
    - Chronic Kidney Disease, defined as an eGFR of < 30 (Cockcroft Gault formula) for 3 months (LSC – 24th November 2012)
    - Need for dialysis for 3 months (MOTxSC – 24th July 2017) (LSC - 8th August 2017)
    - Primary hyperoxaluria
- To list a patient for **combined heart / lung and liver transplant**, one of the following criteria should be met (EC - 28th October 2017):
    - Cirrhosis on USG / CT / MRI or biopsy
    - CTP score ≥ 8 or MELD score ≥ 12
    - HVPG ≥ 10
- Patients will be eligible to receive offers only after 7 days of listing, except for Super-Urgent registration, who are eligible immediately, unless there is no other suitable patient in the same ZTCC – with permission of the LSC (EC - 17th June 2017).

Transfer of Registration

- A patient can maintain only one single registration through any one registered hospital in ZTCC Mumbai. On each new application, patients are required to declare details of any previous registrations with ZTCC Mumbai failing which their application may be rejected.
- Patients wishing to transfer their registration from one hospital to another should:
    - Submit a request through the new hospital through the ZTCC Mumbai App, online on ZTCC Mumbai website or by submitting a paper application (Annexure 3).
    - A letter informing their transfer decision should be submitted to the previous hospital of registration and an acknowledgment / copy of the same attached to their transfer application.
    - The patient will continue to maintain their position on the city waiting list after the transfer, including those on the Super-Urgent waiting list (LSC - 31st August 2019).

- The transfer will be effective only after 7 days of both the application and the acknowledgment letter (except for super-urgent listing, where the transfer will be effective immediately). During this period, the patient will remain active on the previous hospital's waiting list.
- Transfer of registration is permitted only once in 3 months and not more than 2 transfers every calendar year.

- If there is an interruption of a transplant program (temporarily or permanently) for any reason, for any organ, patients on their waiting list may be permitted to get their registration transferred to another hospital of their choice provided they apply to ZTCC for a transfer (16th January 2019)

Follow-up / Updates / Hold / Delisting

- For patients listed in the Super-Urgent category, updates have to be sent every 24 hours to ZTCC (Annexure 5)
- Patients on routine waiting list are required to follow-up with their transplant team periodically, at least monthly, details of which has to be shared with ZTCC (Annexure 4) (LSC – 1st January 2011). Updates about patients who have expired, undergone transplant or have significant change in their condition (such as hospitalization) on the waiting list should be made immediately, with the date and details (LSC - 21st September 2013) (LSC - 1st March 2014).
- All update reports should be done by NABL lab, transplant centre or government hospital
- In addition to the above, the hospital list with updates about all patients listed with them should be sent to ZTCC by the 5th of each month failing which the hospital could be fined (1st failure) or allocation to their patients suspended (2nd failure) (14th May 2016), until updates are resumed (LSC 31st July 2010) (GC - 7th January 2017).
- For patients with HCC, re-Imaging with contrast CT / MRI is required every 3 months, without which they will be put on hold or de-listed (if not received for another 3 months).
- The current position of patients on the waiting list is shared by ZTCC with the hospitals at fixed intervals (every 15 days / every month). Patients can enquire their updated status on the waiting list only through the hospital, and not directly by contacting ZTCC Mumbai.
- Patients can be put on "Hold" status, by an application through their transplant centre, with the reason for the same. Patients on "hold" status will not receive any offers. Request for "Hold" status should be signed both by the treating hepatologist and transplant surgeon (LSC – 21st December 2016). A patient can remain on "Hold" status for 3 months, after which they have to make a decision to become active again or de-list. Patients will retain their original position on the waiting list on reactivation.
- Patients on hold status will be automatically de-listed after 3 months if no updates are received from the hospital. If the patient needs to continue on hold status for a medical reason, the same can be requested by the hospital and discussed in the next LSC meeting for approval (21st September 2013) (LSC - 1st March 2014) (LSC – 22nd December 2018).

Donor information

- Donor information from any hospital can be received by ZTCC in the prescribed format (Annexure X) on ZTCC Mumbai App, ZTCC Website, on e-mail or WhattsApp. Donor information will be forwarded to all transplant centres in order of their patients on the waiting list (LSC - 31st July 2010).
- Donor's identifiable information should not be circulated with their reports. **Donor reports should be circulated without their names – hospital transplant coordinators or ZTCC coordinators should crop the donor's name or blank it out before circulating their reports (23rd march 2019) – to be discussed in the meeting again, as wrong reports may be circulated accidentally.**
- All livers will be considered for distribution / allocation in absence of absolute contraindications such as (GC – 12th Jan 2013):
    - Systemic / metastatic extra-cranial malignancy
    - AIDS (not HIV positivity) – (LSC - 21st December 2016)
- Livers will be offered for distribution either as standard livers or ECD livers. ECD livers will be distributed only after the hospital, transplant team and patients have accepted the ECD nature of the liver, its risks and accepted the same (Annexure ___). Appropriate consent form will be required before allocation / retrieval of such liver. Acceptance of the same will be a prerogative of the transplant teams (24th November 2012).
- ZTCC is only responsible for allocation of the organ and does not determine its' clinical suitability for a certain patient. The decision to accept the organ for a certain patient's transplant is made by the transplant team with the patient's consent and ZTCC cannot be held responsible for organ quality, function, outcomes of transplant or associated risks.
- A pre-retrieval biopsy is not a standard practice but a request for the same can be made to the donor hospital and performed after donor family's consent (21st September 2013)

Allocation

Liver will be offered to patients on the blood-group specific waiting list in the following **sequence**:

- **In case of pediatric donor**
    1. Blood group identical Indian Pediatric Super-Urgent patients "in-house" followed by "city-list".
    2. Blood group identical Indian Pediatric Urgent patients "in-house" followed by "city-list"
    3. Blood group compatible Indian Pediatric Super-Urgent patients "in-house" followed by "city-list"
    4. Blood group compatible Indian Pediatric Urgent patients "in-house" followed by "city-list"
    5. Blood group identical Indian Adult Super-Urgent patients "in-house" followed by "city-list"
    6. Blood group identical Indian Adult Urgent patients "in-house" followed by "city-list"
    7. Blood group compatible Indian Adult Super-Urgent patients "in-house" followed by "city-list"
    8. Blood group compatible Indian Adult Urgent patients "in-house" followed by "city-list"
    9. As a part of blood group identical pediatric multi-visceral transplant, as per OCI higher than liver

10. As a part of blood group compatible pediatric multi-visceral transplant, as per OCI higher than liver
11. Blood group identical Indian Pediatric patients on routine waiting list "in-house" followed by "city-list". In case the centre wishes to allot the "in-house" liver to any patient of the same blood group out of sequence, written explanation for the same should be submitted to ZTCC before allocation can be finalized. The same will be discussed in the next liver sub-committee meeting (24th April 2015) (10th October 2015)
12. Blood group compatible Indian Pediatric routine patients "in-house" followed by "city-list". In case the centre wishes to allot the "in-house" liver to any patient of compatible blood group out of sequence, written explanation for the same should be submitted to ZTCC before allocation can be finalized. The same will be discussed in the next liver sub-committee meeting (24th April 2015) (10th October 2015)
13. As a part of blood group identical adult multi-visceral transplant, as per OCI higher than liver
14. Blood group identical Indian Adult patients on routine waiting list "in-house" followed by "city-list". In case the centre wishes to allot the "in-house" liver to any patient of the same blood group out of sequence, written explanation for the same should be submitted to ZTCC before allocation can be finalized. The same will be discussed in the next liver sub-committee meeting (24th April 2015) (10th October 2015)
15. Blood group compatible Indian Adult routine patients "in-house" followed by "city-list". In case the centre wishes to allot the "in-house" liver to any patient of compatible blood group out of sequence, written explanation for the same should be submitted to ZTCC before allocation can be finalized. The same will be discussed in the next liver sub-committee meeting (24th April 2015) (10th October 2015)

- **In case of adult donor**
    1. Blood group identical Adult Indian patients on Super-Urgent "in-house" followed by "city-list"
    2. In case more than one patient is on Super-Urgent list, sequence of allocation will be as follows:
        a. Blood group compatibility
            i. Identical
            ii. Compatible
        b. Cause of super-urgent listing
            i. Post op liver failure after living donor hepatectomy of donor surgery
            ii. Primary Non-Function (PNF)
            iii. Total hepatectomy / Anhepatic patient
            iv. Acute Liver Failure (ALF)
            v. Hepatic Artery Thrombosis (HAT)
            vi. Acute decompensation of Wilsons disease or Budd Chiari Syndrome or Acute Auto-immune Hepatitis (AIH)
        c. Chronology of registration
    3. Blood group identical Adult Indian patients on Urgent "in-house" followed by "city-list"

4. Blood group compatible Adult Indian patients on Urgent "in-house" followed by "city-list"
5. As a part of blood group identical adult multi-visceral transplant, as per OCI higher than liver
6. Patients on routine waiting list in the following order:
    a. Blood group identical Adult Indian patients on routine waiting list "in-house" followed by "city-list". In case the centre wishes to allot the "in-house" liver to any patient of the same blood group out of sequence, written explanation for the same should be submitted to ZTCC before allocation can be finalized. The same will be discussed in the next liver sub-committee meeting (24th April 2015) (10th October 2015)
    b. As a part of blood group compatible adult multi-visceral transplant, as per OCI higher than liver
    c. Blood group compatible Adult Indian patients on routine waiting list "in-house" followed by "city-list". In case the centre wishes to allot the "in-house" liver to any patient of compatible group out of sequence, written explanation for the same should be submitted to ZTCC before allocation can be finalized. The same will be discussed in the next liver sub-committee meeting (24th April 2015) (10th October 2015) (LSC - 22nd December 2018). Following categories can be given priority in local Hospital waiting list:
        i. Acute Decompensation in Chronic Liver Disease: (nonresponsive to medical therapy)
            1. Hepatic Encephalopathy Gr III /IV
            2. Hepato-renal Syndrome
            3. Hepato pulmonary syndrome
        ii. Decompensated Liver Disease: Child Score > 13
            1. Refractory Ascitis/ Hydrothorax
            2. Repeated SBP
            3. Porto pulmonary Syndrome
        iii. Patient with HCC within UCSF Criteria (Last CECT/MRI within last 3months)
        iv. Pediatric Liver Transplant Candidates with Hepatoblastoma.
        v. Combined Liver Kidney recipient

- Liver from a donor meeting the following criteria should be considered for **splitting**:
    - Age ≤ 40 years
    - BMI ≤30
    - ICU stay ≤5 days
    - SGOT (AST) / SGPT (ALT) ≤ 3x ULN (upper limit of normal)
    - On a single or no vasopressor
    - In case liver from any donor meeting above criteria is not split, written reason for the same should be submitted to ZTCC

- When a liver is split, the transplant team of the patient higher on the waiting list will decide the suitability for splitting, first choice of the lobe, sharing of vessels and bile duct and technique of splitting (13th August 2016).
- In case there are no super-urgent or urgent patients on the waiting list, both lobes can be utilized by the donor hospital "in-house" (LSC - 31st August 2019).
- Left lobe / Left Lateral Segment: will be similar to distribution of liver from a pediatric donor
- Right Lobe / Right Extended lobe: will be similar to distribution of liver from an adult donor
- In case one lobe from a split liver is used "in-house" and the other lobe is offered to the "city-list", payback will not be applicable

- As per the Transplantation of Human Organs Act (THOA) (1994, amended 2011), Indian patients will receive priority over Overseas Citizens of India (OCI) followed by Foreign Nationals (LSC - 14th May 2016), therefore any liver used by ZTCC Mumbai will be offered to SOTTO followed by ROTTO followed by NOTTO before it can be offered to an OCI card holder followed by a Foreign National (in sequence as above).
- Once an offer is made to a hospital, the decision about its acceptance should be made by the center within 1 hour (LSC – 24th April 2015) (21st September 2013).
- It is a prerogative / privilege of the transplant team to determine the suitability of a particular liver for a particular reason (LSC 23rd March 2006). Hospitals / patients may refuse a liver offered to them for one of the following reasons:
  - Logistic (non-availability of the transplant team, patient not contactable or available, patient presently not ready or willing for transplant and others) or
  - Recipient Medical Reasons (patient too well for transplant, patient temporarily unfit for transplant, donor's liver is fatty or unsuitable for the patient and others).
  - Donor / Liver Reasons (Fatty liver, donor malignancy, donor unstable, etc.).
  - The date and time of communication between hospital transplant coordinator and ZTCC coordinator between ZTCC should be part of our records for audit (EC - 10th October 2015).
  - A patient / hospital can refuse for logistic reason 3 times and medical reason for 3 times after which they will be automatically delisted (GC - 25th August 2012).
- Once a liver has been allotted to any recipient, it is final and even if another patient is listed as Super-Urgent after that, they will not be eligible for that particular liver allocation (24th April 2015). Once a refusal has been communicated by the hospital, either due to their patient not willing or patient not contactable, and the organ has been allocated to the next recipient, the allocation will not be reversed even if subsequently earlier recipient becomes available or shows his / her willingness to accept the organ (EC - 6th March 2019).
- In case the new donor information becomes available or significant change in previously provided information occurs, the transplant teams may change their decision for acceptance of the liver (20th March 2019).

- ZTCC may also directly contact the primary and standby / backup recipients to directly confirm their willingness to accept the liver and their current location (LSC - 21st December 2016).
- For in-house livers, two standby recipients have must be kept ready in the same hospital and next two more standby patients as per the city list. The surgical team of the standby patients must be present in the OT during retrieval for their assessment of the liver quality (19th September 2006)
- For "city livers", two more patients are accepted as standby for the same liver. The surgical team of the standby patients must be present in the OT during retrieval for their assessment of the liver quality (19th September 2006)
- In case of acceptance of offer by a hospital and eventual non-acceptance, leading to wastage of the liver, the penalty may extend upto 6 months suspension of allocation to that centre (LSC – 1st January 2011)
- In case a liver is allocated under Super-Urgent category but there is a doubt about underlying chronic liver disease based on clinical, laboratory or abdominal imaging, a liver biopsy maybe performed by the centre. Histopathology reports of all explants allotted under Super-Urgent category has to be mandatorily submitted to the ZTCC within 15 days of transplant. If there is evidence of cirrhosis on explant, payback rule will be applicable to that centre.
- A frozen section biopsy is required for all livers before rejecting the liver by any team (19th September 2006)
- Payback / Debt system (LSC - 19th September 2016) (LSC - 27th June 2017) (LSC - 8th August 2017)
    - If a transplant centre gives up an in-house liver to another hospital for Super-Urgent Patient, the next liver allotted to an elective patient of that recipient hospital from the city pool or next "in-house" donor in that recipient hospital (whichever happens earlier), will be allotted to the patient of donor hospital which gave up the liver. However if a liver offered through this Payback system is not accepted by the hospital which is being compensated and some other hospital uses it, then hospital being compensated would lose the chance.
- Allocation for multi-organ transplants: the organ of critical importance (OCI) dictates the sequence of allocation and such patients name is maintained only on the OCI list. The non-OCI organ from the same donor is allotted to the same patient simultaneously.
- Proposal for institutional rotation was rejected by the EC (LSC - 27th June 2017) (LSC - 8th August 2017) (30th December 2017)
- Allocation based on MELD score has been considered and not implemented because of logistic challenges with frequent updation of score required (21st September 2013) (13th August 2016) (21st December 2016). Regular updation of MELD scores of patients on the waiting list and an audit after 6 months could be analyzed to determine feasibility of moving to the MELD–Na based allocation system (LSC - 21st December 2016). **ZTCC should sign an MoU with each hospital to allow access to the patient's data for scrutiny of documents (LSC - 6th April 2017) – to be discussed again in the meeting.** In that case, existing patients on the waiting list may also have to be compensated for their waiting time (LSC - 6th April 2017). There was consensus regarding the use of

MELD-Na for allocation, however whether it should be within the institution or across the city list could not be decided (27th June 2017) (LSC - 8th August 2017)

- The following data from each donor should be sent to ZTCC:
    - Admission notes
    - Clinical history and medical summary
    - ICU chart (images clicked / copies for all days)
    - Investigation chart / table
    - Imaging, histopathology, endoscopies and other reports relevant to the case

Retrieval

- Liver retrieval team should reach within 4 hours after accepting the organ, send the local or nearest retrieval surgeon, nominate a recognized trained surgeon from another centre to retrieve the organ on their behalf or request the retrieval team from rota to help with the retrieval (LSC - 31st July 2010) (LSC - 1st January 2011) (LSC - 31st July 2010) (LSC - 21st September 2013) (EC 15th Feb 2014).
- A weekly rota for liver retrieval of participating teams is followed by ZTCC Mumbai, in case the recipient centre needs help. The next hospital on the waiting list should be available for evaluation of the liver, if it is rejected by the primary team. The rota week can be mutually exchanged between centers after informing ZTCC. The next week center on-call team will serve as a backup in case the center on call is unable to do the retrieval for some reason (LSC - 22nd December 2018).
- The recipient team is responsible for providing all logistic and material support for the same.
- In the setting of a replaced right hepatic artery arising from the SMA that the liver and pancreas teams would work to ensure that both organs are retrieved to achieve transplantation, even if it means an additional vascular reconstruction for a replace right hepatic artery from the SMA traversing through the body of the pancreas. In case of differences of opinion on variant anatomy requiring reconstruction, instead of sub-optimal use of organs, the issue to be escalated to the multi-visceral committee, whose say will be final and binding (MOTxSC – 24th July 2017) (LSC - 8th August 2017).
- Outstation retrieval of livers and heart/lungs where a chartered flight is used: attempts should be made to share a single chartered aircraft to transport the heart/lung and liver back to Mumbai to save costs. A time limit of 20 minutes from heart on ice to liver on ice was proposed and agreed. It was also agreed that centers would send their experience retrieving surgeons for remote retrievals and also carry out maximal dissection during the warm phase, in order to keep cardiac cold ischemia time as short as possible (MOTxSC – 24th July 2017) (LSC - 8th August 2017). 3 members of the heart team and 2 from the liver / pancreas team should travel for retrieval (EC – 29th September 2017)
- A form for donor liver quality and characteristics should be sent to ZTCC after retrieval (Annexure ___) (LSC 22nd December 2018).

- Retrieval surgeon should take photos of gross liver and send to next standby hospital coordinator and ZTCC coordinator (LSC - 23rd March 2019). Retrieval team from the backup recipient hospitals should be ready to go to the donor hospital for inspection of the liver if the need arises (LSC - 23rd March 2019).
- If the retrieving surgeon is likely to not accept an organ, another transplant surgeon from the standby patient's hospital / nearest transplant center may be required to go to the donor hospital for assessment, a biopsy should be done. All vital decisions such as cross-clamp should only be made after discussion with ZTCC and standby hospital's surgeons' assessment. Cross clamp should be done by the retrieval team only if they have made a decision to use the liver. In case the retrieval team is unsure about using the liver, the decision to cross clamp should only be made after confirmation from the chair or co-chair of the liver sub-committee (LSC - 23rd March 2019). The team that perfuses the liver should bear the cost of perfusion fluids if it not used by anyone (21st September 2013).
- All donor cultures and procalcitonin reports should be sent to ZTCC (LSC - 23rd March 2019)
- Recipient team should collect and carry donor's blood samples and required tissues for more tests (LSC - 23rd March 2019), to enable cryopreservation of donor blood and tissue samples (LSC - 23rd March 2019) (10th July 2019) (15th June 2019) (8th May 2019)
- Machine perfusion when available can be utilized by centres for ECD livers (LSC - 23rd March 2019).
- Retrieval time is decided by the donor hospital. If any hospital needs a change of timing, they should contact the donor hospital directly (6th March 2019)
- In case of a HCC patient, two standby patients should be kept ready (in case metastatic disease is found on laparotomy) (6th March 2019)
- In case of multi-visceral retrieval, the preservative solutions could be shared as follows:
    - HTK: 6 Lit (liver) and 2 litres each for each kidney
    - UW: 4 litres for liver and 1 litre each for each kidney

Expanding the donor pool / improving liver utilization

- SOP for category 4 DCD and uncontrolled DCD is being prepared and consent form for cannulation and post-death organ donation to be implemented selectively in few hospitals (LSC – 20th April 2019)

Academics, Data collection and outcomes analysis

- ZTCC should collect data about all waiting list mortality, cadaveric liver transplants and their outcomes in a specified format from all centres (LSC – 16th August 2014) (21st December 2016)
- At every LSC meeting liver allocations done since the last meeting will be discussed (24th April 2015)
- All hospitals that perform cadaver liver transplants for FHF must submit explant histology reports to ZTCC and ZTCC must maintain these records (10th October 2015)

- Monthly liver club meeting could be held under the aegis of ZTCC LSC (21st December 2016)
- A data monitoring and analysis committee constituting Dr. Darius Mirza, Dr. Sudeep Shah and Dr. Amit Gupte were formed (LSC - 6th April 2017)
- Audit committee: audit the applications, validity of information presented (with source documents), exception status granted, outcomes (mortality and complications), marginal organ outcomes and other outcome measures. Expert group + Dr. Mathur + public representative. Audit has to be done every 3 months (9th June 2015)
- Routing HLA testing of all cadaveric donors has been proposed (MOTxSC – 24th July 2017) (EC – 29th September 2017), cost (Rs. 30,000) to be incurred by ZTCC (GC - 27th February 2019) by NABL lab, transplant centre or government hospital
- Proposal for collaborative research is invited from all centres (LSC - 8th August 2017). ALF, ACLF, Wait-list profile & mortality and Tx outcomes based on donor recipient profiles (LSC - 6th June 2018)
- ECD donors data should be maintained on a real-time basis including the Cause of recipients death should be included, to enable analysis of outcomes of these cases (LSC - 23rd March 2019).
- A hard copy of the donor's clinical information should be maintained too (23rd January 2019).
- All hospitals are required to submit reports and MELD-Na score of all registered as well as transplanted patients to ZTCC before 1st February 2019. Once a liver is allocated, the hospital is required to submit following details of the recipient before transplant or after transplant within 24hrs (23rd January 2019) from a NABL lab, transplant centre or government hospital:
    - LFT/ RFT/ PT/ INR
    - If HCC last imaging report (CT/MRI/PET scan/Ultrasound)
- If a transplant patient dies after transplant within 3 months, the hospital has to inform ZTCC within 24 hours (12th December 2018). All outcomes data should be collected by ZTCC (GC – 25th July 2015)

Patient / Media communication

- Information about the salient points of the liver guidelines should be available on ZTCC website (LSC – 1st January 2011)
- Communication with the media on the matters of allocation should only be done by the official spokesperson of ZTCC (LSC - 24th April 2015).

Missing minutes

- 21st February 2015