High Acuity Liver Transplantation

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Objectives

Following the presentation, the learner will be able to:

- List the challenges encountered in transplant medicine
- Identify the tool used for liver allocation
- Describe how the liver allocation score works
- Recall the management of high acuity liver transplant recipients
- Identify future goals and approaches to improving liver transplantation

Liver Transplant

Why Transplant?

- Irreversible, severe liver disease
- Decompensated condition
- Liver disease irretractable conservative therapy or management
- Other medical or surgical methods have been exhausted

https://www.thoughtco.com/liver-anatomy-and-function-4058938

Challenges in Liver Transplant

- Growing population of individuals requiring life saving organ transplant
- Not enough donors to meet this growing need
- Mortality rates on the transplant waitlist
- Geographic disparities
- Social, racial, & economic disparities

The MELD Score

MELD Score

Model for End-Stage Liver Disease (MELD)

- More objective approach to stratifying at need patients
- Prioritization based upon medical urgency
- Score ranges from 6 to 40
- The higher the score, the greater the risk of 90-day mortality

MELD Score

Calculating the MELD Score

- The following diagnostic values are used to calculate the MELD score
    - Creatinine
    - Bilirubin
    - International normalized ratio (INR)
    - Sodium

MELD Exceptions

- Per the Organ Procurement and Transplantation Network (OPTN), a transplant center can request MELD exception points if they believe "their current MELD score does not appropriately reflect the candidate's medical urgency for transplant."

MELD Score

MELD Exceptions

- These are considered "standard MELD exceptions":
    - hepatocellular carcinoma
    - hepatopulmonary syndrome
    - portopulmonary hypertension
    - familial amyloid polyneuropathy
    - primary hyperoxaluria
    - cystic fibrosis
    - hilar cholangiocarcinoma
    - hepatic artery thrombosis
    - metabolic disease

Managing High MELD Patients

High MELD scores commonly correlate with acute decompensation manifested by

- Ascites
- Encephalopathy
- Gastrointestinal bleeding
- Infection/sepsis

Acute decompensation versus acute-on-chronic-liver failure (ACLF)

- Acute decompensation- present with signs & symptoms associated with decompensation of liver disease (GI bleed, HE, infection)

- ACLF- present with signs & symptoms of decompensation but with one or more extrahepatic organ system failures

ACLF

- Much higher mortality

- Higher MELD

- Multi-organ failure requiring intensive therapies & ICU management

CLIF-C Organ Failure Score

Organ Failure	Definition
Liver	Bilirubin ≥ 12 mg/dl
Kidney	Creatinine ≥ 2 mg/dl or RRT
Circulatory	Use of vasopressors
Brain	Grade 3 or 4 hepatic encephalopathy (HE)
Respiratory	P/F ratio ≤ 200

Artru, F., & Samuel, D. (2019)

Multi-organ Failure Management

- Liver- pharmaceutical management, coagulation factors, TIPS

- Kidney- volume expansion, CRRT, renal protection

- Circulatory- volume resuscitation, vasoactive agents

- Brain- HE management, ICP management

- Respiratory- ventilatory support

Goal is to stabilize & optimize for transplant
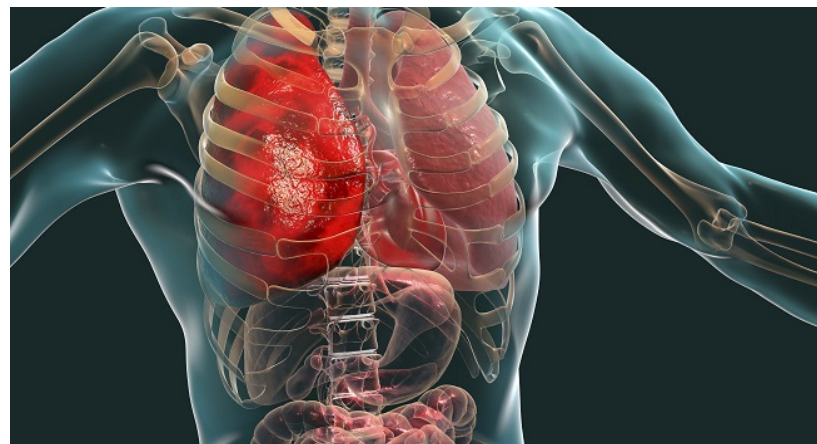
Credit: Kateryna_Kon - stock.adobe.com

"Too sick to transplant"

"Medical futility"

How do we decide?

Google Image

High Acuity Management

- Pretransplant variables
  - Comorbidities
  - Frailty
- Medical review board
  - Multi-disciplinary approach
- Post transplant outcomes
  - Graft survival
  - Patient survival

The Future of Liver Transplant

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Looking to the Future

Donor pool expansion

- Older donors
- Split graft & living donor liver transplantation
- Use of hepatitis C positive grafts
- Donation after cardiac death

Toniutto, P., Zanetto, A., Ferrarese, A.& Burra, P. (2017)

Looking to the Future

Addressing disparities

- Assignment of exception points

- Changes to allocation policies

- Outreach programs

Looking to the Future

Continued research & advancements

- Machine perfusion
- Managing immunosuppressant therapies

Google Image

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