Liver Transplant Post-operative Care

Key early management issues:

1. **Ongoing fluid resuscitation – may require large volumes of IV fluid**
   - Pre-existing ascites/ongoing drain losses/complex intraoperative course may predict those who require large volumes of fluid
   - Frequent clinical and biochemical assessment crucial
   - **Any increase in lactate or noradrenaline** consider a minimum 500ml fluid bolus
   - Consider HAS as fluid resuscitation if significant pre-existing ascites
2. **Potential for bleeding**
3. **Assessment of early graft function**
   - Clinical/biochemical/haematological/acid base and radiological assessment (Doppler of liver vasculature in 1st 24hrs organised by transplant team)

On Admission:

- **Sedation-** patients arrive from theatre sedated and ventilated (see drugs below)
- **Bloods-** see dedicated liver transplant results flow sheet for first 24hrs tests/times
- **CXR-** to check ETT, Lines and NG tube placement
- **Lines:**
  - **Arterial x 2 (usually radial and femoral)** transduce both waveforms
  - **IJ Vein x 2**
    - 1 quad lumen CVP line
    - 1 rapid infusion MAC line (minimise use, not for vasoactive drugs)
    - PA catheter must be transduced and displayed (if present)
    - Ensure obturator in place when PA catheter removed
- **NG tube-** on free drainage
- **Urinary catheter**
- **Surgical drains**

Drugs:

1. **Antibiotics (check what has been given in theatre):**
   - Gentamicin 2mg/kg at induction, nil further
   - Amoxicillin 1g at induction and repeated at 8 hours
   - Metronidazole 500mg at induction and repeat at 8 hours

If Penicillin Allergic:

- Vancomycin 1g at induction and repeated at 12 hours (withhold second dose if creatinine clearance following transplant <40ml/min as per Cockcroft-Gault equation)
- Ciprofloxacin 400mg at induction and repeated at 12 hours
- Metronidazole 500mg at induction and repeated at 8 hours

2. **Fluconazole-** 100mg IV daily
3. **Pantoprazole-** 40mg IV daily
4. **Sedation-** Propofol and Alfentanil
5. **Analgesia-** Fentanyl or Morphine PCA when extubated

Title: Liver Transplant Post-operative Care	
Version: 3	**Authors:** D Cameron, C Beattie, O Robinson
Status Draft/Final: Final	**Approved by:** O.Robinson (Editorial Lead)
	Written:13/06/2019
Reviewed on: 10/08/2020	**Next review :** 10/08/2023

6. **Immunosuppression:**
   - Hydrocortisone 100mg IV BD
   - Azathioprine 1mg/kg/day orally, (mane) day after transplant (rounded to nearest 25mg e.g. 80kg patient = 75mg/day)
   - Tacrolimus bd at 10:00 and 22:00 po/ng starts morning after surgery. Dose determined by Hepatology Consultant. Tacrolimus levels Mon, Wed, Fri

7. **Hepatitis B Patients:**
   - Hepatitis B Immunoglobulin (HBIg)- see instructions in red pharmacy folder and discuss with Hepatology Consultant
   - Maybe required if patient known to be hep B positive pre-op or has received hep B +ve graft

Important next steps

1. **Markers of acceptable graft function**
   - Biochemical (falling lactate and no requirement for dextrose)
   - Haematological (falling/stable PT)

2. **Coagulopathy and haematological considerations**
   - Correction of coagulopathy should be guided by ROTEM and clinical condition of the patient i.e. whether ongoing bleeding
   - Correction of coagulopathy in absence of bleeding is not advised
   - In patients at increased risk of hepatic artery thrombosis (HAT) i.e. small artery or jump graft required the surgical team may request some of the following measures:
     i. Daily aspirin
     ii. Mini-hep 5000units BD/TDS
     iii. IV heparin infusion (usually without loading dose with APTT initially every 6 hours to avoid over anti-coagulation)
     iv. Haemodilution to ensure Hb < 10g/dl

3. **Bleeding**
   - Suspected significant bleeding following correction of coagulopathy contact the surgical liver transplant registrar oncall or if not available the consultant liver surgeon

4. **Extubation**
   - General condition and stability will dictate speed of weaning and extubation
   - Stable patients should be extubated **as soon as possible**
   - Extubation improves blood supply to the transplanted liver

5. **Common pitfalls**
   - Failure to recognise hypovolaemia. Consider in presence of rising lactate and inappropriate or persistently rising doses of noradrenaline

6. **Removal of lines**
   - Lines should not be removed until radiological confirmation of graft perfusion
   - Assess coagulopathy/low platelets- D/W consultant prior to correction/line removal
   - IJ MAC line and femoral A-Line should ideally be removed before discharge to HDU

Discharge to transplant HDU:
Discharge paperwork as per unit procedure
Lines: 1 arterial, 1 venflon, 1 CVP monitoring line

Blood results sheet for first 24 hours post op

Patient name	**Liver Transplant**
CHI	**Blood Results Sheet (1st 24 Hours)**

6 hourly formal blood tests. ABG hourly. Additional blood test maybe required e.g following bleeding
Do "Morning Bloods" at appropriate time, usually 18 hour sample

ABG Table:

Time Taken										
Hour Post-op	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**12**	**18**	**24**
FiO_2										
H^+										
$PaCO_2$										
PaO_2										
cHCO3										
BE										
Lactate										
Glucose										
Na+										
K+										
Ca2+										
Hb (ABG)										

Formal bloods table:

Hb (Lab)		[redacted]			
Platelets					
PT					
APTT					
Fibrinogen					
TCO_2					
Urea					
Creatinine					
Bilirubin					
ALT					
GGT					
Alk Phos					

Product									
Time	Theatre								
FFP									
Platelet									
Cryo									
RCC									