Emergency Department Guideline
Fever in the Liver Transplant Patient

Inclusion criteria:
- Patient with measured or reported fever (≥38.0°C/100.4°F) and history of liver transplant.

Triage considerations:
- ESI triage level 2
  - Triage level 1 and immediate placement in resuscitation room if altered mental status, significant VS abnormalities, other clinical concern
- Full set of vitals including blood pressure
- Acetaminophen if current fever and none given in 4 hours
  - NO ibuprofen or other NSAID for liver transplant patients
- Room immediately if at all possible; avoid waiting room exposure
- Goal is for all patients who meet sepsis or septic shock criteria to receive IV antibiotics within 60 minutes of arrival

Laboratory studies:
- In all patients:
  - Obtain IV access or access indwelling line in all patients
  - Blood culture from each port of indwelling line
    - Peripheral cultures NOT routinely indicated in patients with lines
  - Single peripheral blood culture if no line
  - CBC with diff
  - Comprehensive metabolic panel
  - Respiratory virus panel (if respiratory symptoms)
  - UA/UC from clean catch or catheter
- In patients who are significantly ill-appearing:
  - Coagulation studies: INR, PTT, fibrinogen, D-dimer
  - iStat CG8
  - Lactate
  - Procalcitonin

Imaging:
- CXR if respiratory symptoms
- Focused RUQ abdominal US if RUQ pain, acute increase in bilirubin or liver enzymes.
  Complete abdominal US if other abdominal concerns
Medications/interventions:

- **Goal is for all patients who receive antibiotics to receive their first dose of IV antibiotic within 60 minutes of arrival.** Well appearing patients with normal vital signs may not need antibiotics (see below).
- Severely ill-appearing or toxic patients and those who meet septic shock criteria (sepsis plus evidence of cardiovascular dysfunction, including mottled skin, delayed or flash cap refill, altered mental status, decreased urine output, or hypotension):
  - Supportive care for sepsis as needed
    - Obtain 2 points of IV access if possible
    - IV NS Bolus 20 ml/kg rapid push x 3 if needed to support circulation
    - Additional circulatory support per sepsis guideline
  - IV antibiotics as soon as possible (attempt to obtain urine culture before antibiotics, but do not delay):
    - **Vancomycin** 15 mg/kg IV AND
    - **Piperacillin/tazobactam** 100 mg/kg IV OR
    - **Meropenem** 20 mg/kg IV for penicillin or cephalosporin allergy, or history of carbapenem resistant enterobacteriaceae
- Patients who meet sepsis/SIRS criteria but not septic shock criteria (fever plus tachycardia, tachypnea, leukopenia OR leukocytosis):
  - Prompt antibiotics (attempt to obtain urine culture before antibiotics but avoid delays)
    - **Piperacillin/tazobactam** 100 mg/kg IV OR
    - **Meropenem** 20 mg/kg IV for penicillin or cephalosporin allergy, or history of carbapenem resistant enterobacteriaceae
  - If the patient has an indwelling central venous catheter or history of VRE, ADD **Vancomycin** 15 mg/kg IV
- Well-appearing patients with fever but no vital sign abnormalities:
  - Hold antibiotics pending labs and discussion with gastroenterology attending or fellow

- **Acetaminophen (Tylenol) prn fever**
  - 15 mg/kg PO/IV

Consultations:

- Pediatric gastroenterology, Pediatric transplant surgery

Reassessments:

- Continuous cardiorespiratory monitoring with pulse ox for ill-appearing patients
- VS with BP q1h for other patients

Differential diagnosis:

- Sepsis/septic shock
- Ascending cholangitis
- Pneumonia
- UTI
- Line infection
• Viral illness
• Transplant rejection

Discharge or Admission criteria:

• PICU
  o Intubated patient
  o Vital sign instability
  o Sepsis/septic shock requiring significant resuscitation

• Inpatient floor
  o Most patients, particularly if:
    ▪ Acute increase in hepatic enzymes or bilirubin
    ▪ Concern for respiratory compromise
    ▪ Poor PO intake
    ▪ Meets sepsis criteria
    ▪ Central line or PICC in place

• Discharge home
  o Well-appearing
  o Tolerating PO intake
  o No ongoing fluid losses or concern for dehydration
  o Reliable family with transportation and access to close (usually 1 day) follow-up
  o Agreement of gastroenterology consultant

Quality measures:

• First dose if IV antibiotics within 60 minutes if given
• Blood and urine cultures prior to antibiotics