LOYOLA UNIVERSITY

INPATIENT HEPATOLOGY CURRICULUM AND ORIENTATION

Revised 05/2013

Curriculum: Hepatology Inpatient Service

Site: Loyola University Hospital

Revision Date: May, 2013
Rotation Director: Natasha Von Roenn, MD
Specialty Education Coordinator: Natasha Von Roenn, MD

Staffing:
1 Attending (2 week rotation)
1 Fellows (GI/Liver)
1 Senior Resident (PGY 2/3/4)
1 Intern
1 Sub-Intern (MS4)

EDUCATIONAL PURPOSE, RATIONALE OR VALUE

The purpose of the rotation is to give residents exposure and experience in managing common liver diseases and their associated complications. Residents should learn how to approach these syndromes, including:

1. How to focus the history and physical examination for patients with liver disease.

2. How to review the medical record, looking for information on patient demographics, risk factors for liver disease, medication history, and laboratory information.

3. How to perform procedures such as paracentesis.

4. How to interpret special laboratory tests including liver enzymes, viral serologies, autoimmune markers, and ascitic fluid analysis.

5. How to give recommendations and/or manage these syndromes after reviewing tests, reviewing the literature, and examining and discussing the cases with the attending physician.
DAILY SCHEDULE

1. **Work Rounds**: Pre-round, get sign out from cross-cover, etc
   Monday- Friday 6 am-7 am
   *Determine which patients need IR procedures that day – CALL IR*
   *Tell GI Fellow of any possible endoscopic procedures for the day*

2. **Hepatology rounds**: depending on attending
   Monday-Friday 7 /8 am – 9/10 am

2. **Work**: Place critical orders, call consults, place discharges
   Monday-Friday 9/10 am – 12

3. **Noon Conference**

4. **Other Conferences**:
   A. Liver Conference – Wednesdays at 12-1 (required)
   B. Multidisciplinary Radiology Tumor Conference: Fridays at 8 am in Interventional Radiology (optional)
   C. Transplant Listing Meeting: Fridays at 9 am 3rd floor of the EMR building (optional)

5. **Monday – Friday 1-6 pm; Teaching, Work**

INPATIENT SERVICE “nuts and bolts”

1. Cap for hepatology service is 10 pts: If you go below 10, you have space for more patients
2. Consults will be followed by GI fellow
3. Any complicated admissions should be staffed with GI fellow
4. Notify GI Fellow if any floor patient is transferred to ICU (day or night)
5. Nicole Evans, APN will help with taps, communication with IR, OSH transfers
6. Notify transplant surgery if listed patient with MELD >25 is admitted
7. Notify transplant surgery if post-transplant patient <3 months is admitted
8. All surgical consults should go to transplant surgery, unless o/w specified by attending
9. In general, CBC, CMP, and PT/INR ordered daily on all inpatient cirrhotics
10. IR liver biopsy patients can be discharged same day if without complications
11. Post-TIPS patients monitored at least 1-2 days following procedure. Discharge must be approved by attending
12. Post-TACE, post-RFA patients observed overnight, AM labs to be drawn
13. Avoid benzodiazepines, narcotics, sedatives overnight on cirrhotics
The following problems will be encountered by most residents during the course of their rotation on the Hepatology Service:

1. **Evaluation of the patient with acute hepatitis**
   a. Differential diagnosis
   b. Diagnostic tests involved
   c. Interpretation of labs and radiographs
   d. Management

2. **Evaluation of the patient with chronic hepatitis**
   a. Etiologic considerations
   b. Recognition of complications
   c. Management of complications
   d. Preventative medicine considerations
   e. Identification of patients who should be considered for liver transplant

3. **Hepatic Encephalopathy**
   a. Recognition
   b. Identification of precipitating events
   c. Management
   d. Prevention

4. **Ascites**
   a. Recognition of clinical manifestations
   b. Identification of precipitating events
   c. Management
   d. Recognition and treatment of peritonitis syndromes

5. **Portal hypertension**
   a. Recognition and screening
   b. Variceal management (primary/secondary prophylaxis)
   c. Hepatorenal syndrome; recognition and management

6. **Hepatocellular carcinoma**
   a. Methodology of screening
   b. Diagnosis
   c. Treatment options

7. **Liver transplantation**
   a. Identification of patients
   b. Indications/contraindications
   c. How to evaluate a patient for transplant
   d. Complications (rejection, biliary strictures, etc)
   e. Background on immunosuppressive agents
Residents are encouraged to read the guidelines published by the American Association for the Study of Liver Diseases (AASLD) which are located at the agency’s website (www.aasld.org).

The attending and fellow will recommend additional readings related to particular patient management issues throughout the rotation.

Residents are encouraged to reference the attached reading list for the rotation.

### COMPETENCY–BASED GOALS AND OBJECTIVES

**1. Patient Care**

Residents are expected to provide patient care that is compassionate, appropriate and effective for the promotion of health, prevention of illness, treatment of disease and at the end of life.

*Educational Objectives:*

- Gather accurate, essential information from all sources, including medical interviews, physical examinations, medical records and diagnostic/therapeutic procedures.

- Make informed recommendations about preventive, diagnostic and therapeutic options and interventions that are based on clinical judgment, scientific evidence, and patient preference.

- Develop, negotiate and implement effective patient management plans and integration of patient care.

- Perform competently the diagnostic and therapeutic procedures considered essential to this specific area of internal medicine. Specifically the indications, risks and performance of paracentesis.

*Methods of Assessment:*

These objectives are addressed as part of the clinical inpatient and outpatient care activities as outlined in educational purpose, rational or value and principal teaching methods. The residents’ performance and progress are monitored by faculty and documented on the resident evaluation form.

**2. Medical Knowledge**

Residents are expected to demonstrate knowledge of established and evolving biomedical, clinical and social sciences, and the application of their knowledge to patient care and the education of others.

*Educational Objectives:*
Apply an open-minded analytic approach to acquiring new knowledge.

Access and critically evaluate current medical information and scientific evidence.

Develop clinically applicable knowledge of the basic and clinical sciences that underlie the practice of hepatology

Apply this knowledge to clinical problem-solving, clinical decision-making, critical thinking.

**Methods of Assessment:**

These objectives are addressed as part of the clinical inpatient and outpatient care activities as outlined in educational purpose, rational or value and principal teaching methods. The residents’ performance and progress are monitored by faculty and documented on the resident evaluation form.

**3. Practice-Based Learning and Improvement**

Residents are expected to be able to use scientific evidence and methods to investigate evaluate and improve patient care practices.

**Educational Objectives:**

*Identify areas for improvement and implement strategies to enhance knowledge, skills, attitudes and processes of care.*

*Analyse and evaluate practice experiences and implement strategies to continually improve the quality of patient care.*

*Develop and maintain a willingness to learn from and use errors to improve the systems or processes of care.*

*Use information technology or other available methodologies to access and manage information, support patient care decisions and enhance both patient and physician education.*

**Methods of Assessment:**

During the hepatology rotation, residents review patient care provided by the hepatology team against the benchmarks of quality care. These reviews are part of daily consultation rounds, patient management in the clinics, and patient case presentations prepared by the residents. The residents’ performance and progress are monitored by faculty and documented on the resident evaluation form.
4. Interpersonal and Communication Skills

Residents are expected to demonstrate interpersonal and communication skills that enable them to establish and maintain professional relationships with patients, families and other members of health care teams.

Educational Objectives:

- Provide effective and professional consultation to other physicians and health care professionals and sustain therapeutic and ethically sound professional relationships with patients, their families and colleagues.
- Use effective listening, nonverbal, questioning, and narrative skills to communicate with patients and families.
- Interact with consultants and referring physicians in a respectful, appropriate manner.
- Maintain comprehensive, timely and legible medical records.

Methods of Assessment:

In both the inpatient and outpatient setting, housestaff work in teams that include the attending hepatologist, the liver fellow, students, and advanced practitioners. This environment provides “hands on” experience in leadership and management skills. Residents are evaluated by faculty on their teaching and leadership skills.

5. Professionalism

Residents are expected to demonstrate behaviors that reflect a commitment to continuous professional development, ethical practice, an understanding and sensitivity to diversity and a responsible attitude toward their patients, their profession, and society.

Educational Objectives:

Demonstrate respect, compassion, integrity, trustworthiness and altruism in relationships with patients, families, and colleagues.
Demonstrate a continuing commitment to excellence, sensitivity and responsiveness to the gender, age, culture, religion, sexual preference, socioeconomic status, beliefs, behaviors and disabilities of patients and professional colleagues.

Adhere to high ethical and moral standards and principles of confidentiality, scientific/academic integrity, and informed consent.

Exercise accountability to self and peers, responsibility to the profession, and contribution to the review of practice and standard setting.

Methods of Assessment:

These objectives are addressed as part of the clinical inpatient and outpatient care activities as outlined in educational purpose, rational or value and principal teaching methods. The residents’ performance and progress are monitored by faculty and documented on the resident evaluation form.

6. Systems-Based Practice

Residents are expected to demonstrate both an understanding of the contexts and systems in which health care is provided, and the ability to apply this knowledge to improve and optimize health care.

Educational Objectives:

Understand, access and utilize the resources, providers and systems necessary to provide optimal care.

Understand the limitations and opportunities inherent in various practice types and delivery systems, and develop strategies to optimize care for the individual patient.

Apply evidence-based, cost-conscious strategies to prevention, diagnosis and disease management.

Collaborate with other members of the health care team to assist patients in dealing effectively with complex systems and to improve systematic processes of care.

Understand the indications for liver transplantation and the methods by which patients are placed on transplant lists.

Methods and Assessment:

The patient population cared for at LUMC includes patients who are insured via indemnity plans, managed care plans and entitlement programs, as well as patients who are uninsured or underinsured. Patient care decisions are often governed by affordability and these issues are routinely discussed as
part of the daily care of patients. In addition, these issues are discussed during formal instructions on health care delivery provided at hepatology teaching presentations.

**METHODS OF EVALUATION FOR RESIDENT AND PROGRAM PERFORMANCE**

Residents will be evaluated by the attending that supervise them over the duration of their rotation. Verbal feedback is given throughout the rotation and an ABIM-format Resident Performance Evaluation form is completed at the end of the month. The evaluation of clinical competence of the housestaff is based on a number of criteria, including medical knowledge, clinical skills, clinical judgment, humanistic qualities, professional attitudes and behavior, medical care and teaching.

Residents, in turn, evaluate the attending physicians and rotation using a standard departmental form that provides for comments. This information is used to make changes to improve the experience for the housestaff and/or improve patient care.

**STRENGTHS AND LIMITATIONS**

The patients seen on the inpatient service often have serious and complex medical problems. In addition to becoming adept at managing liver patients, the resident will be exposed to a variety of non-hepatic related medical conditions. This will provide for a very broad base of clinical exposure. In addition, the multicultural and ethnic nature of our patient population provides for a broader range of diseases than would be found in a hospital with a more narrow cultural and ethnic composition. Also, being a tertiary center with liver transplant capabilities, the resident will be exposed to referral physicians and hospitals and will learn how to network with outside organizations and physician

**Expectations:**

- **Patient Care:** Provide excellent patient-centered care to all patients, communicate all relevant patient care information to the attending physician in a timely fashion, and keep family members appropriately updated.
- **Attendance / Punctuality.** Call the appropriate CMR ASAP to report acute illness or personal / family emergency necessitating absence so that ward and clinic coverage may be found.
- **Professional behavior**
- **Student Teaching and Supervision.**
- **Completion of the above learning objectives and reading.**
- **Work rounds prior to attending rounds each day.**
**Reading List**

**Acute Liver Injury:**


**Abnormal Liver Enzymes:**


**Portal Hypertension and Cirrhosis:**


**Hepatitis**


**Hepatocellular Carcinoma**

Hepatocellular Carcinoma. NEJM. 2011; 365: 1118-1127
Hepatology Quiz:

1. Which of the following is an incorrect match-up between disease and LFT abnormalities?
   a) Acute acetaminophen-induced hepatitis: AST 4,000 / ALT 3,000
   b) Chronic Hepatitis C: AST 56 / ALT 37
   c) Alcoholic Hepatitis: AST 1500 / ALT 747
   d) Non-Alcoholic Fatty Liver Disease: ALT 87 / AST 65
   e) Ischemic Hepatitis: AST 1282 / ALT 1085

2. All of the following regarding TIPS are true, except:
   a) It is done by placing a stent between the hepatic vein and the portal vein in the liver under radiological control.
   b) The objective is to produce a porto-systemic shunt to reduce the portal pressure and hence the variceal bleeding
   c) Patency of the portal vein should be confirmed before the procedure
   d) May precipitate or worsen hepatic encephalopathy
   e) If re-bleeding occurs, the shunt should be removed

3. All of the following are true of spontaneous bacterial peritonitis in a cirrhotic, except:
   a) It is typically a mono-microbial infection
   b) Patients often present with abdominal pain and fever
   c) Recurrence is common, but there is no way to prevent it
   d) It is defined by >250 neutrophils/mm3 AND a positive ascites fluid culture
   e) Gram negative enteric organisms are the most common seen in SBP

4. All of the following can be precipitating factors of hepatic encephalopathy, except:
   a) Aggressive diuresis
   b) Medication non-compliance
   c) Occult Infection
   d) Diarrhea or constipation
   e) Placement of a TIPS
   f) Development of hepatocellular carcinoma
   g) All of the above

5. Which of the following is true of Acute Liver Failure?
   a) Defined by a prolonged PT and hepatic encephalopathy in a patient without any known underlying liver disease
   b) If the patient is not jaundiced, they do not have acute liver failure
   c) The most common cause in the United States is viral hepatitis
   d) Patients who meet the criteria for acute liver failure can be safely monitored in a community hospital or on a floor bed until they become hypotensive or require intubation
e) All patients with acute liver failure should undergo a liver biopsy to determine the cause

6. Which of the following is not a cause of acute hepatitis?
   a) Autoimmune hepatitis
   b) Hepatitis B
   c) Drug-Induced Hepatitis
   d) Hepatitis A
   e) Hemochromatosis

7. Which of the following is not a requirement in the diagnosis of Acute Liver Failure?
   a) Coagulopathy (INR >1.5)
   b) Any Degree of Hepatic Encephalopathy
   c) No pre-existing cirrhosis (except Wilson’s or Hepatitis B)
   d) Duration of symptoms < 26 weeks
   e) Total Bilirubin >6

8. All of the following should be considered in a patient with newly diagnosed HCV/ETOH cirrhosis, MELD 27 and ascites.
   a) Ultrasound imaging for HCC surveillance q 6 months
   b) EGD to evaluate for the presence of esophageal varices
   c) Evaluate and Listing for Liver Transplantation
   d) Serological evaluation for hepatitis A and B, vaccination when appropriate
   e) Encourage alcohol abstinence and alcohol rehabilitation if indicated
   f) Treatment of hepatitis C with Pegylated, Ribavirin, and Telaprevir

9. All of the following is indicated in a patient with ETOH cirrhosis who presents with hematemesis, hypotension, and a prior history of bleeding esophageal varices except?
   a) ICU admission
   b) Intubation for Airway Protection
   c) Octreotide Infusion, 50 mcg/hr
   d) Antibiotic prophylaxis with Ceftriaxone 1gm IV q24 hrs
   e) Interventional Radiology Consultation for possible TIPS
   f) Initiation of non-selective Beta-blocker therapy for primary prophylaxis of variceal bleeding

10. 43 yo alcoholic man with 3 months of abdominal distension, leg edema, and dyspnea. Exam: spiders, distant heart sounds, marked ascites, and leg edema.
CXR: mild cardiomegaly
T.bili 1.5, Albumin 3.5, INR 1.2
U/S: ascites, coarse liver, patent hepatic and portal veins
Abd Fluid: total protein 4.2 gm/dL and albumin of 2.1 g/dL
Which of the following is the most likely cause for the ascites?
   a) Budd-Chiari Syndrome
   b) Alcoholic cirrhosis
   c) Cardiomyopathy
   d) Nephrotic syndrome
   e) Peritoneal carcinomatosis

11. A 46 yo man was transplanted for HCV-cirrhosis; at 10 months he has normal allograft function and is on immunosuppression with tacrolimus monotherapy. On Norvasc for hypertension and baby aspirin. At 1 year, he is asymptomatic and on no new medications. AST 124, ALT 187, T.bili 1.0, FK level 5.7. U/S normal. The most likely diagnosis is:
   a) Acute cellular rejection
   b) Recurrent hepatitis C
   c) CMV infection
   d) Biliary stricture
   e) Drug hepatotoxicity

12. A 45 yo male with alcoholic cirrhosis is hospitalized with fever, jaundice, and confusion. Exam shows T 38.5, jaundice, moderate to severe ascites, slow mentation and asterixis. Labs Na 130, K 4.8, Cr 2.1, T.bili 4.5, AST 50, Hgb 12.5, WBC 12,000. Paracentesis shows 5000 total cells, 90% PMN’s, Cultures of blood, urine, and ascites are pending. The most appropriate next step is:
   a) Intravenous cefotaxime
   b) IV cefotaxime and 25% albumin
   c) Increase diuretic therapy to control ascites
   d) Oral norfloxacin until culture results available
   e) Increase Lactulose

13. A 52 yo man with decompensated HCV cirrhosis is admitted with worsening renal function. On Nadolol, spironolactone, furosemide, lactulose. Afebrile, BP 95/60, jaundiced, moderate ascites but no edema. Paracentesis with removal of 200mL ascites 2 days before showed ascetic fluid protein 1.2 g/dL with 600 cells, 2% PMN’s.

<table>
<thead>
<tr>
<th></th>
<th>Na</th>
<th>Cr</th>
<th>Alb</th>
<th>Bilirubin</th>
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<tbody>
<tr>
<td>1 week PTA</td>
<td>128</td>
<td>0.9</td>
<td>2.4</td>
<td>5.3</td>
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<tr>
<td>Day 1</td>
<td>120</td>
<td>1.8</td>
<td>2.3</td>
<td>8.7</td>
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The most likely cause of renal dysfunction is:
   a) Prerenal azotemia
   b) Post-paracentesis circulatory dysfunction
14. A 23 yo female is brought in with 2 weeks of jaundice and 24 hours of somnolence. She became sexually active with a man 16 weeks ago; he is known to have hepatitis B.

Exam: jaundice, disorientation, asterixis. Lab: ALT 1648, T.bili 12.5, INR 2.4, HB sAg negative, anti-HCV negative, and anti-HAV negative

Which one of the following would you advise now?

a) Serologic studies for herpes
b) Ceruloplasmin
c) IgM anti-HBc
d) ANA
e) Start tenofovir

15. 63 yo asymptomatic woman sent because of abnormal ALT two months after starting atorvastatin 20 mg/day. Pre-treatment ALT was normal. No risk factors for liver disease. Exam is notable for mild obesity. AST and ALT were 65. CBC, ALP, t.bili, INR, and albumin are normal.

What would be the best next step?

a) Observe and repeat ALT in 3 months
b) Liver Biopsy
c) Liver Ultrasound
d) Stop atorvastatin
e) Check AMA, ANA, HBsAg, and anti-HCV