# Cirrhosis Quicknotes – Rev 09/11/2017

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<tr><td rowspan="5">Management of compensated cirrhosis<br>(no ascites, variceal hemorrhage, encephalopathy, or jaundice)</td><td colspan="4">HCC surveillance (every 6 months):<br>• Ultrasound<br>• AFP</td><td></td></tr>
<tr><td rowspan="4">Varices surveillance (upper endoscopy)</td><td>No varices</td><td colspan="2">• Repeat endoscopy in 3 years if etiology removed; repeat endoscopy in 2 years if ongoing injury. Sooner if decompensation occurs</td><td></td></tr>
<tr><td rowspan="2">Small varices</td><td>• In a CTP class C patient or varices with red signs</td><td>• Nonselective beta-blockers (propranolol or nadolol) or carvedilol</td><td>• Propranolol (20-160 mg BID) or nadolol (20-160 mg QD); titrate to maximum tolerable dosage or a heart rate of 55-60 beats/min<br>• Carvedilol, maximum 12.5 mg/day<br>• No need to repeat endoscopy</td></tr>
<tr><td>• In a CTP class A/B patient, without red signs</td><td colspan="2">• Nonselective beta-blockers optional<br>• If no beta-blockers given, repeat endoscopy in 2 years if etiology removed; repeat endoscopy in 1 year if ongoing liver injury. Sooner if decompensation occurs.</td></tr>
<tr><td>Medium/Large varices → prevention of first variceal hemorrhage</td><td>Nonselective beta-blockers (propranolol, nadolol) or Carvedilol<br>OR<br>Endoscopic variceal ligation (choice depends on patient characteristics and preferences, local resources)</td><td colspan="2">• Propranolol (20-160 mg BID) or nadolol (40-160 mg QD); titrate to maximum tolerable dosage or a heart rate of 55-60 beats/min<br>• Or carvedilol at maximum dose of 12.5 mg/day<br>• No need to repeat endoscopy<br><br>• Ligate every 1-2 weeks until variceal obliteration<br>• First surveillance endoscopy 1-3 months after obliteration, then every 6-12 months indefinitely</td></tr>
<tr><td rowspan="8">Management of decompensated cirrhosis<br>(patient has developed ascites, variceal hemorrhage or encephalopathy)</td><td colspan="4">HCC surveillance (every 6 months):<br>• Ultrasound<br>• AFP</td><td></td></tr>
<tr><td rowspan="7">Variceal hemorrhage<br>(if no history, follow guidelines for varices surveillance in compensated cirrhosis)</td><td rowspan="4">Acute variceal hemorrhage</td><td>Diagnosis</td><td colspan="2">Any of the following findings on upper endoscopy performed within 12 hours from admission:<br>• Active bleeding from a varix<br>• Stigmata of variceal hemorrhage (white nipple sign)<br>• Presence of gastroesophageal varices without another source of hemorrhage</td></tr>
<tr><td>General management</td><td colspan="2">• Establish Child-Pugh score on admission<br>• Cautious transfusion of fluids and PRBC with a goal hemoglobin of ~7-8 g/dL<br>• Antibiotic prophylaxis (3-7 days) with:<br>o Ceftriaxone 1 g/day (IV)</td></tr>
<tr><td>Specific initial management</td><td colspan="2">• Pharmacologic therapy initiated as soon as diagnosis is suspected<br>o Octreotide 50 mcg IV bolus followed by continuous infusion 50 mcg/hour (3-5 days)<br>• Endoscopy within 12 hours of admission with ligation performed if variceal source is confirmed<br>• In patients with CPS of 10-13, placement of TIPS must be considered within 24-48 hours of endoscopy (early TIPS)</td></tr>
<tr><td>Rescue TIPS</td><td colspan="2">Considered in patients with bleeding esophageal varices who are not candidates for early TIPS and who have failed pharmacologic + endoscopic therapy or in patients with bleeding gastric fundal varices who have failed one endoscopic therapy (cyanoacrylate)</td></tr>
<tr><td rowspan="3">Prevention of rebleeding<br>(should be instituted before patient leaves hospital)</td><td rowspan="2">First-line therapy</td><td rowspan="2">Nonselective beta-blockers (propranolol, nadolol) but not carvedilol<br>AND<br>Endoscopic variceal ligation</td><td>• Propranolol (20-160 mg BID) or nadolol (20-160 mg QD)<br>• In patients with ascites cap dose to 80 mg (BID for propranolol, QD for nadolol)<br>• Titrate to maximum tolerable dosage or a heart rate of 55-60 beats/min</td></tr>
<tr><td>• Ligate every1-2 weeks until variceal obliteration<br>• First surveillance endoscopy 1-3 months after obliteration, then every 6-12 months</td></tr>
<tr><td>Second-line therapy</td><td colspan="2">• TIPS if patient rebleeds on combined NSBB + ligation<br>• Consider TIPS if patient bled while on NSBB or in patients who cannot tolerate NSBB (ligation alone is suboptimal tx)</td></tr>
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| | **Spontaneous bacterial peritonitis (SBP)** | **Active SBP** | Diagnosis | Consider SBP and perform diagnostic paracentesis if:<br>• Symptoms/signs (abdominal pain, fever, chills)<br>• Patient is in ER or admitted<br>• Worsening renal function or encephalopathy<br><br>**SBP present if ascites PMN count >250 cells/µL**<br>**(if fluid macroscopically bloody, subtract 1 PMN per 250 RBC/µL)** | |
| | | | General management | • Avoid large-volume paracenteses during active infection<br>• Intravenous albumin (1 g/kg of body weight) if BUN >30 mg/dL, creatinine >1 mg/dL, bilirubin >4 mg/dL; repeat at day 3 if renal dysfunction persists<br>• Avoid aminoglycosides | |
| | | | Specific management | Community-acquired SBP, no history of antibiotic prophylaxis, no history of antibiotics in previous 90 days, no history of infection with MDR organism | • Cefotaxime 2 g IV every 12 hours OR<br>• Ceftriaxone 2 g every 24 hours<br>• Ceftazidime 2 g every 8 hours |
| | | | | Healthcare associated-SBP or nosocomial SBP (3 days after admission) or history of antibiotics in previous 90 days or history of infection with MDR organism | Broader-spectrum antibiotics:<br>• Vancomycin + Zosyn or<br>• Meropenem + daptomycin |
| | | | Follow-up | • Continue therapy for 7 days<br>• Repeat diagnostic paracentesis at day 2:<br>-If ascites PMN count decreases by at least 25% at day 2, IV therapy can be narrowed (if started on broad spectrum AB and organism susceptible) or switched to oral therapy (quinolone such as ciprofloxacin or levofloxacin 250 mg PO BID) to complete 7 days of therapy<br>-If ascites PMN has not decreased or increases, image the abdomen (at least flat film to detect free air), check culture results and consider broadening antibiotic spectrum | |
| | | **Preventing recurrent SBP**<br>(should be instituted before patient leaves hospital) | Recommended therapy | Oral norfloxacin 400 mg PO QD (preferred) **OR**<br>Oral ciprofloxacin 250 mg QD **OR**<br>Oral levofloxacin 250 mg QD | |
| | | | Alternative therapy | TMP-SMX 1 double-strength tablet PO QD<br>(Patients who develop quinolone-resistant organisms may also have resistance to TMP-SMX) | |
| | | | Duration | Prophylaxis should be continued until the disappearance of ascites, time of transplantation, or death | |
| | **Ascites** | **Uncomplicated ascites** | General management | • Treat ascites once other complications have been treated<br>• Avoid NSAIDs<br>• Consider norfloxacin prophylaxis (400 mg PO QD) in patients with an ascites protein level of <1.5 g/dL, impaired renal function (serum creatinine level ≥1.2 mg/dL, BUN ≥25 mg/dL, serum sodium level ≤130 mEq/L), or severe liver failure (Child-Pugh score ≥9 points with serum bilirubin level ≥3 mg/dL) | |
| | | | Specific management | Salt restriction | • 1-2 g/day<br>• Liberalize if restriction results in poor food intake |
| | | | | Diuretics | Spironolactone based:<br>• Spironolactone alone (start at 50-100 mg QD, single morning dose)<br>**OR**<br>• Spironolactone (50-100 mg QD) + furosemide (start at 20-40 mg QD, single morning dose) |
| | | | | LVP | Use as initial therapy only in patients with tense ascites; give IV albumin (6-8 g/L of ascites removed) |
| | | | Follow-up and goals | • Adjustment of diuretic dosage should be performed every 4-7 days<br>• **Patient should be weighed at least weekly and BUN, creatinine and electrolytes measured every 1-2 weeks while adjusting dosage**<br>• Double dosage of diuretics if:<br>o Weight loss <2 kg (4 lb) a week **AND**<br>o BUN, creatinine, and electrolytes OK<br>• Halve dosage of diuretics or discontinue if:<br>o Weight loss ≥0.5 kg/ (1 lb) day **OR**<br>o Abnormalities in BUN, creatinine, or electrolytes<br>• Maximum diuretic dosage is spironolactone (400 mg QD) and furosemide (160 mg QD) | |

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| | | **Refractory ascites** | Definition | • Ascites that is not eliminated even with maximum diuretic therapy<br>• Ascites that is not eliminated because maximum dosages of diuretics cannot be attained given the development of diuretic-induced complications | | | |
| | | | Recommended therapy | • Total paracentesis + IV albumin (6-8 g/L of ascites removed)<br>• If <5 L of ascites is removed, a synthetic plasma volume expander may be used instead of albumin<br>• Continue with salt restriction and diuretic therapy as tolerated | | | |
| | | | Alternative therapy | • TIPS in patients with MELD <15 (think of it sooner rather than later)<br>• Peritoneovenous shunt for patients who are not TIPS or transplant candidates | | | |
| | **Hepatorenal syndrome (HRS)** | **Diagnosis** | • Diagnosis of AKI: increase in serum creatinine by ≥ 0.3 mg/dL or ≥1.5 X from baseline\<br>• Main differential is between prerenal azotemia (most common), ATN and HRS (least common)<br>• PRA and HRS are prerenal (functional) forms of AKI and should be suspected with FeNa <0.5% (<0.1% suggests HRS), evidence of volume depletion (overdiuresis, diarrhea, GI bleed), factors that will worsen vasodilatation (infection, vasodilators) or use of NSAIDs<br>• ATN is an intrarenal (structural) from of AKI and should be suspected with FeNA >0.5%, if there is clinical evidence of severe hypoperfusion (shock), history of nephrotoxins or contrast dye, casts in urine, albuminuria >100 mg/dL (in the absence of CKD), | | | |
| | | **Stepwise management** | • Panculture, diagnostic paracentesis, start antibiotics if strong suspicion of infection (SIRS)<br>• Discontinue diuretics, vasodilators, NSAIDs, nonselective beta-blockers<br>• If GI bleed or diarrhea, treat accordingly<br>• Expand with saline (if obvious dehydration) | | | |
| | | | • IV albumin 25-50 g BID if creatinine increases despite general measures outlined above | | | |
| | | | • If creatinine continues to increase despite all above measures and albumin infusion and, after excluding ATN or other structural causes of AKI, start specific therapy for HRS<br>• A patient with HRS typically has ascites (refractory), hyponatremia, low MAP and a FeNa <0.1% | | | |
| | | **Specific therapy** | Vasoconstrictors<br>**AND**<br>IV albumin<br>(both for at least 7 days) | • Octreotide PLUS Midodrine | 100-200 mcg SC TID | Goal to increase MAP by 10 to 15 mmHg |
| | | | | | 7.5-12.5 mg PO TID | |
| | | | | • Norepinephrine | 0.02 to 0.4 mcg/kg/min | |
| | | | | • Terlipressin | 0.5-2.0 mg IV every 4-6 hours | |
| | | | | • 50-100 g IV QD | | |
| | | | Sequence of therapy | In the absence of terlipressin (preferred):<br>• Start octreotide+midodrine on floor but advance doses quickly based on effect on MAP, creatinine/urine output<br>• If no effect in any of these parameters at day 3 of therapy with octreotide/midodrine → transfer to ICU for norepinephrine infusion | | |
| | **Hepatic encephalopathy (HE)** | **Acute HE** | General management | • Identify and treat precipitating factor (GI hemorrhage, infection, prerenal azotemia, constipation, sedatives)<br>• Do not assume that HE is the result of noncompliance to lactulose before ruling out precipitants | | |
| | | | Specific therapy | • Lactulose enemas (300 cc in 1 liter of water) in patients who are unable to take it PO<br>• Lactulose 25 mL PO every 1-2 hours until at least two soft or loose BM are produced and then adjust to 2-3 BM/day<br>• Lactulose can be discontinued once precipitating factor has resolved<br>• In an otherwise compensated patient in whom there is no precipitant, look for a spontaneous splenorenal shunt that could then be embolized | | |
| | | **Chronic HE** | General management | • No long-term protein restriction<br>• Protein from dairy or vegetable sources is preferable to animal protein<br>• Avoid sedatives and tranquilizers<br>• Avoid constipation | | |
| | | | Specific therapy | • Lactulose dosage that produces 2-3 soft, formed bowel movements per day, starting at 15-30 cc PO BID<br>• | | |
| | | | Alternative therapy | • Rifaximin 400 mg PO TID in patients who cannot tolerate lactulose<br>• Rifaximin + lactulose in patients with recurrent or persistent HE<br>• In patients with TIPS and recurrent HE, consider TIPS reduction<br>• In patients without TIPS and recurrent HE, look for a spontaneous splenorenal shunt that could be embolized | | |

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| **When to refer for transplant evaluation** | Calculate:<br>• CTP score<br>• MELD score | **Link to CTP calculator** | • Prepare transplant evaluation packet if CTP score ≥7 |
| | | **Link to MELD calculator** | • Prepare transplant evaluation packet if:<br>  • MELD score ≥15<br>  • MELD score 11-13 and patient has refractory ascites or hyponatremia (sodium <130 mmol/L)<br>  • HCC criteria met (1 tumor ≥ 2 cm; or no more than 3 tumors ≤ 3 cm; or no more than 1 tumor ≤ 5 cm; downstaging per regional review board) |
| **Frequency of follow-up visits** | Depends on MELD score | **Link to MELD calculator** | • ≤10: every 6-12 months<br>• 11-18: every 3 months<br>• 19-24: every month<br>• ≥25: every week |