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<p>Cirrhosis is defined histologically as an advanced form of progressive hepatic fibrosis with distortion of the hepatic architecture and regenerative nodule formation. It may be due to a variety of causes. It can be diagnosed incidentally on liver biopsy or hepatic imaging studies, or patients may present clinically with one or more features of hepatic failure. This article gives the reader a broad overview of the epidemiology, diagnosis, and natural history of cirrhosis; laying the foundation for subsequent articles, which will discuss the diagnosis and management of each of the specific cirrhosis-related complications.</p>	
<b>Ascites: Diagnosis and Management</b>	<b>801</b>
Wei Hou and Arun J. Sanyal	
<p>Ascites is the pathologic accumulation of fluid in the peritoneal cavity and is a common manifestation of liver failure, being one of the cardinal signs of portal hypertension. The diagnostic evaluation of ascites involves an assessment of its cause by determining the serum-ascites albumin gradient and the exclusion of complications eg, spontaneous bacterial peritonitis. Although sodium restriction and diuretics remain the cornerstone of ascites management, many patients require additional therapy when they become refractory to such medical treatment. These include repeated large volume paracentesis and transjugular intrahepatic portosystemic shunts. This review article summarizes diagnostic tools and provides an evidence-based approach to the management of ascites.</p>	
<b>Hepatic Encephalopathy: Pathophysiology and Emerging Therapies</b>	<b>819</b>
Vinay Sundaram and Obaid S. Shaikh	
<p>Hepatic encephalopathy is characterized by neuropsychiatric abnormalities in patients with liver failure. Severe hepatic encephalopathy is an indication for liver transplantation as it portends poor outcome. Treatment of hepatic encephalopathy involves correction of precipitating factors such as sepsis, gastrointestinal bleeding, medications, and electrolyte imbalance. Effective therapies include lactulose and antibiotics such as neomycin, metronidazole, and rifaximin.</p>	
<b>Portal Hypertension and Variceal Hemorrhage</b>	<b>837</b>
David A. Sass and Kapil B. Chopra	
<p>Portal hypertension is a progressively debilitating complication of cirrhosis and a principal cause of mortality in patients who have hepatic decompensation. This article describes the classification system and</p>	

pathophysiology of portal hypertension. It also discusses a practical approach to prevention of first variceal hemorrhage, general management of the acute bleeding episode, and secondary prophylaxis to prevent rebleeding. Pharmacologic, endoscopic, radiologic, and surgical modalities are all described in detail.

### **Renal Failure in Patients with Cirrhosis**

855

Lina Mackelaite, Zygimantas C. Alsauskas, and Karthik Ranganna

Renal failure in cirrhosis poses unique diagnostic and therapeutic challenges. Laboratory values and predictive equations grossly overestimate renal function in patients with cirrhosis. Development of renal failure connotes a worse prognosis; mortality is especially high with hepatorenal syndrome. Classification of the causes of renal failure in patients with cirrhosis is provided with more extensive discussion of selected causes. Finally, a suggested diagnostic approach to renal failure in cirrhosis is given.

### **Pulmonary Complications of Cirrhosis**

871

C. Singh and J.S. Sager

Advanced liver disease and portal hypertension produce various intrathoracic complications that involve the pleural space, the lung parenchyma, and the pulmonary circulation. Dyspnea and arterial hypoxemia are the most common symptoms and signs in patients with such complications. This article focuses on the diagnosis and management of hepatopulmonary syndrome, portopulmonary hypertension, and hepatic hydrothorax. All are pulmonary processes associated with end-stage liver disease that lead to significant morbidity and affect the quality of life of patients who are suffering from liver cirrhosis.

### **Current Management of Hepatocellular Carcinoma**

885

Manuel Mendizabal and K. Rajender Reddy

Hepatocellular carcinoma (HCC), one of the most common cancers worldwide, continues to increase in incidence in several regions around the world and is associated with poor overall survival. Patients with cirrhosis are at the highest risk and are candidates for surveillance. Wide implementation of surveillance programs and improvement in noninvasive radiologic techniques has led to tumor diagnosis at earlier stages. Surgical options that include resection and liver transplantation offer the best chance of successful outcomes. Locoregional therapies, such as radiofrequency ablation and chemoembolization, provide effective local control in those with acceptable hepatic function. A multikinase inhibitor, sorafenib, is the first molecular targeted oral therapy that has recently been shown to provide a survival benefit in HCC in select patients.

### **Health Maintenance Issues in Cirrhosis**

901

Gaurav Mehta and Kenneth D. Rothstein

Caring for patients with cirrhosis requires special consideration. The role of the hepatologist is to assist the primary care physician in caring for such patients. This involves an active role in immunizations, lifestyle

modifications, and providing instructions on when to go to the emergency room (ER). There are also specific recommendations geared toward the patient with cirrhosis relating to slowing down the disease process, maintaining quality of life, and improving survival.

**Preoperative Risk Assessment for Patients with Liver Disease** **917**

Shahid M. Malik and Jawad Ahmad

Patients with underlying liver disease often present for non–liver-related surgery and are at risk for postoperative decompensation. Several predictive models exist to determine the risk of morbidity and mortality after surgery in such patients, but the risk depends on the severity of liver disease and also the type and urgency of the surgery. Clinicians should be cognizant of the various risk assessment tools and incorporate them into their practice when encountering patients with liver disease undergoing surgery.

**Liver Transplantation: From Child to MELD** **931**

Juan F. Gallegos-Orozco and Hugo E. Vargas

The widespread availability of transplantation in most major medical centers in the United States, together with a growing number of transplant candidates, has made it necessary for primary care providers, especially Internal Medicine and Family Practice physicians to be active in the clinical care of these patients before and after transplantation. This review provides an overview of the liver transplantation process, including indications, contraindications, time of referral to a transplant center, the current organ allocation system, and briefly touches on the expanding field of living donor liver transplantation.

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