**Name of Journal:** *World Journal of Gastroenterology*

**Manuscript NO:** 56195

**Manuscript Type:** GUIDELINES

**Chinese guidelines on the management of liver cirrhosis (abbreviated version)**

Xu XY *et al.*Guidelines on management of liver cirrhosis

Xiao-Yuan Xu, Hui-Guo Ding, Wen-Gang Li, Jing-Hang Xu, Ying Han, Ji-Dong Jia, Lai Wei, Zhong-Ping Duan, En-Qiang Ling-Hu, Hui Zhuang

**Xiao-Yuan Xu, Jing-Hang Xu,** Department of Infectious Diseases, Peking University First Hospital, Beijing 100034, China

**Hui-Guo Ding,** Hepatology and Digestion Center, Beijing You-An Hospital, Capital Medical University, Beijing 100069, China

**Wen-Gang Li,** Department of Liver Oncology, Cancer Radiation Therapy Center, Fifth Medical Center, PLA General Hospital, Beijing 100039, China

**Ying Han,** Department of Immunology and Liver Diseases, Beijing You-An Hospital, Capital Medical University, Beijing 100069, China

**Ji-Dong Jia,** Hepatology Center, Beijing Friendship Hospital, Capital Medical University, Beijing 100050, China

**Lai Wei,** Internal Medicine of Hepatopancreatobiliary, Beijing Tsinghua Changgung Hospital, Beijing 102218, China

**Zhong-Ping Duan,** Artificial Liver Center, Beijing You-An Hospital, Capital Medical University, Beijing 100069, China

**En-Qiang Ling-Hu,** Department of Gastroenterology, First Medical Center, PLA General Hospital, Beijing 100853, China

**Hui Zhuang,** Department of Pathogenic Biology, Peking University Health Science Center, Beijing 100191, China

**Author contributions:** Xu XY edited and reviewed the manuscript; Ding HG, Li WG, Xu JH, Han Y, Jia JD, Wei L, Duan ZP, Ling-Hu EQ, and Zhuang H approved the final article.

**Corresponding author: Xiao-Yuan Xu, MD, Doctor,** Department of Infectious Diseases, Peking University First Hospital, No. 8 Xishiku Street, Xicheng District, Beijing 100034, China. xiaoyuanxu6@163.com

**Received:** April 20, 2020

**Revised:** June 3, 2020

**Accepted:** November 12, 2020

**Published online:**

**Abstract**

Based on reviews of the literature and experts’ consensus, the Chinese Society of Hepatology developed guidelines for the diagnosis and treatment of liver cirrhosis, in order to improve clinical practice. In addition to what has been covered in previously published guidelines on the management of cirrhosis complications, these guidelines add new sections and provide updates. The guidelines emphasize the early diagnosis of the cause and assessment of complications. Comprehensive treatments including etiological treatment and complication management should be initiated immediately. In addition, regular monitoring, especially surveillance of hepatocellular carcinoma, is crucial for managing patients.

**Key Words:** Liver cirrhosis; Diagnosis; Therapy; Guidelines; Hypertension portal; Recompensated stage

Xu XY, Ding HG, Li WG, Xu JH, Han Y, Jia JD, Wei L, Duan ZP, Ling-Hu EQ, Zhuang H. Chinese guidelines on the management of liver cirrhosis (abbreviated version). *World J Gastroenterol* 2020; In press

**Core Tip:** Based on reviews of the literature and experts’ consensus, the Chinese Society of Hepatology developed guidelines for the diagnosis and treatment of liver cirrhosis, in order to improve clinical practice. In addition to what has been covered in previously published guidelines on the management of cirrhosis complications, the guidelines adds new sections and provides updates. The guidelines emphasizes the early diagnosis of the cause and assessment of complications. Comprehensive treatment including etiological treatment and complication management should be initiated immediately. In addition, regular monitoring, especially surveillance of hepatocellular carcinoma, is crucial to manage patients.

**INTRODUCTION**

Cirrhosis is currently the 11th most common cause of death globally and accounts for approximately 2 million deaths per year worldwide[1]. The American Association for the Study of Liver Disease, World Gastroenterology Organization, European Association for the Study of the Liver, and International Club of Ascites have developed and updated multiple guidelines and consensuses for the diagnosis and treatment of cirrhosis and its complications[2-4].

To promote diagnosis and treatment of cirrhosis, the Chinese Society of Hepatology (CSH) and the Chinese Society of Gastroenterology (CSG) of Chinese Medical Association (CMA) developed the Chinese Guidelines for the Diagnosis and Treatment of Esophageal and Gastric Variceal Bleeding in Cirrhotic Portal Hypertension[5], Guidelines on the Management of Ascites and Its Related Complications in Cirrhosis[6], and Guidelines on Management of Hepatic Encephalopathy in Cirrhosis[7] recently. The present guideline adds new sections and provides updates.

These guidelines were developed according to evidence-based medicine and Appraisal of Guidelines Research and Evaluation Instrument (AGREE II). A guidance group, secretary group (writing group), and expert group (including corresponding experts) were established and included experts in the fields of liver disease, gastroenterology, infectious disease, surgery, intervention therapy, oncology, traditional Chinese medicine, pharmacology, nursing and clinical study methodology.

The evidence and recommendations mentioned in these guidelines are graded according to the grading of recommendations assessment, development and evaluation (GRADE) system[8].

**Etiology**

Common causes of cirrhosis are: hepatitis B and C, alcoholic consumption, non-alcoholic fatty liver disease, autoimmune liver diseases, Wilson’s disease, hemochromatosis, and chronic drug-induced liver injury. Other causes include hepatic amyloidosis, a1-antitrypsin deficiency, hepatic porphyrian, parasitic infections mainly including schistosomiasis and clonorchiosis, circulatory disturbance such as Budd-Chiari syndrome, and right heart failure. Some patients with cirrhosis have no unknown cause.

Most cases of cirrhosis have a single cause, but sometimes multiple causes co-exist. Superinfection of hepatitis B and C and alcohol consumption in patients with hepatitis B or C are common examples. In addition, based on the primary cause, some synergetic factors can contribute to the exacerbation of cirrhosis such as obesity, insulin resistance, and some drugs[9-13].

**Evaluation of liver function and portal hypertension**

***Evaluation of liver function and compensatory capacity***

The indicators reflecting hepatic synthetic function include serum albumin (ALB), pre-ALB, coagulation factors, cholesterol, and cholinesterase[14]. With the short half-life, coagulation factors is an early indicator. Prothrombin activity (PTA) and prothrombin international normalized ratio (PT-INR) are the most commonly used.

***Scoring systems for assessing the prognosis in cirrhosis patients***

Scoring systems for assessing prognosis in cirrhosis patients include Child-Pugh score[15], model for end-stage liver disease (MELD), and MELD-Na score[16].

***Common methods of imaging assessments in cirrhosis***

Common imaging assessments methods in cirrhosis include sonography, computed tomography (CT) scan, and magnetic resonance imaging (MRI) scan, which can be used to screen the liver tumor and evaluate portal hypertension[17,18]. Recently, liver stiffness measurement (LSM) and transient elastography (TE) have become the most convenient non-invasive diagnostic methods for hepatic fibrosis and early cirrhosis. Fibroscan® (FS) and Fibrotouch® (FT) are the most commonly used LSM tools in the clinic. Detailed cutoff values and the diagnostic value of LSM in hepatic fibrosis and cirrhosis can be found in the Consensus on clinical application of transient elastography detecting liver fibrosis: A 2018 update[19]. Magnetic resonance elastography (MRE), a more recently developed non-invasive staging and diagnosis method for hepatic fibrosis, can be used in patients with ascites and obesity or metabolic syndrome, and can test the whole liver. However, MRE is costly, and its value in staging and diagnosing early cirrhosis and hepatic fibrosis should be further studied. At present, it is not suitable for conventional monitoring of hepatic fibrosis in Chinese patients with chronic liver diseases.

***Histological evaluation***

Histological evaluation is a “gold standard” for diagnosing and evaluating cirrhosis. Adoption of the Laennec cirrhosis scoring system is suggested (Appendix 3)[20,21].

***Evaluation of portal hypertension***

In addition to imaging technology including sonography, LSM, CT, MRI, and MRE, endoscopy including gastroscopy and enteroscopy[5] and hepatic venous pressure gradient (HVPG) measurement[22] are reliable for evaluating the severity of portal hypertension.

***Nutritional risk screening and malnutrition evaluation***

Nutritional risk screening and malnutrition evaluation in patients with cirrhosis is detailed in Chinese clinical guidelines on nutrition in end-stage liver disease (2019)[23].

**Diagnosis**

The diagnosis of cirrhosis should comprehensively take into account etiologies, medical history, clinical manifestations, complications, treatment process, laboratory tests, imaging, and histological examinations. Traditionally, cirrhosis can be classified into compensated stage and decompensated stage. However, recent data have shown that some patients with decompensated cirrhosis became recompensated, which is defined as no more decompensation for years with the development in the treatment of cirrhosis. In addition, some patients with cirrhosis present with reversion of cirrhosis[24]. Thus, we suggest that stages of cirrhosis include compensated stage, decompensated stage, recompensated stage, and/or cirrhosis reversion.

Diagnosis of compensated cirrhosis is based on one of the following criteria: (1) histologically cirrhosis; (2) gastroesophageal varices or digestive tract ectopic varices on the basis of excluding noncirrhotic portal hypertension; (3) imaging of cirrhosis or portal hypertension, *e.g.*, splenomegaly, portal vein ≥ 1.3 cm; (4) LSM result complying with diagnostic cutoff of cirrhosis of different causes; and (5) meeting two or more of the following criteria: (a) platelet (PLT) < 100 × 109/L, without any other reasons; (b) serum ALB < 35 g/L, excluding malnutrition or kidney diseases; (c) INR > 1.3 or PT prolonged (discontinuing thrombolysis or anticoagulant drugs for over 7 d); and (d) aspartate aminotransferase (AST)/PLT ratio index (APRI): adult APRI score > 2.

Diagnosis of decompensated cirrhosis is based on the existence of cirrhosis and any one of the complications including ascites, gastroesophageal varices hemorrhage, sepsis, hepatic encephalopathy, and hepatorenal syndrome.

Cirrhotic recompensation and/or reversion: accumulating evidence has demonstrated that effective antiviral treatment in decompensated HBV and HCV cirrhosis patients can lead to the recompensation of the liver function and reduce liver transplantation. Even though the definition of recompensation of decompensated cirrhosis has not been established, Chinese experts agree with the following preliminary criteria: When decompensation events (ascites, digestive tract hemorrhage, hepatic encephalopathy) have not recurred for a long time period (at least 1 year) after effective treatment in patients with decompensated cirrhosis, these patients will be classified as recompensated population.

Similarly, clinical data have provided evidence of cirrhosis reversion[25-29] defined as: Ishak fibrosis staging decreases by ≥ 1 stage, or P-I-R classification after treatment decreases.

**Recommendation 1:** Cirrhosis can be classified into compensated stage, decompensated stage, recompensation stage and/or cirrhosis reversion (B, 1).

**Recommendation 2:** Diagnosis of compensated cirrhosis: (1) histologically cirrhosis (A, 1); (2) gastroesophageal varices or digestive tract ectopic varices on the basis of excluding non-cirrhotic portal hypertension (B, 1); (3) imaging reveals cirrhosis or portal hypertension (B, 1); and (4) meeting two or more of the four criteria: (a) PLT < 100 × 109/L without any other reasons; (b) ALB < 35 g/L, excluding malnutrition or kidney diseases; (c) INR > 1.3 or PT prolonged; (d) APRI > 2 (B, 1).

**Recommendation 3:** Diagnosis of decompensated cirrhosis: (1) cirrhosis; and (2) any one of the complications of portal hypertension including ascites, gastroesophageal varices hemorrhage, sepsis, hepatic encephalopathy, and hepatorenal syndrome (B, 1).

**Cirrhosis-related complications**

***Serous effusion***

Serous effusion of patients with cirrhosis includes ascites, pleural effusion, and pericardial effusion. Refer to the Chinese guidelines on the management of ascites and its related complications in cirrhosis for the diagnosis of cirrhotic ascites[6]. Chylous ascites (CA), hemorrhagic ascites and pleural effusion are discussed here.

The diagnosis of CA is based on the distinct characteristic of the ascitic fluid which includes a milky appearance and a triglyceride level > 200 mg/dL. Though CA can occur in all stages of cirrhosis, it is necessary to exclude other underlying etiologies such as trauma, congenital diseases, infections (especially pulmonary tuberculosis and filariasis), neoplasms, operations, or heart diseases.

Hemorrhagic ascites is diagnosed with a red blood cell count level > 50000/mm3 in ascites. It is necessary to exclude other underlying etiologies such as tumor, severe infection (including tuberculous peritonitis), coagulopathy, and peritoneal varicose vein rupture.

Pleural effusion in patients with cirrhosis is more common in the right side, but can be bilateral when severe. It can be caused by etiologies other than cirrhosis, such as tuberculosis, which should be excluded. Diagnosis of pleural effusion can be based on chest ultrasonography or X-ray[30].

***Gastrointestinal tract hemorrhage***

Esophageal and/or gastric variceal rupture is the most common reason for gastrointestinal tract hemorrhage in patients with cirrhosis. See the guidelines for the diagnosis and treatment of esophageal and gastric variceal bleeding in cirrhotic portal hypertension 2016[5] for details. Other reasons include portal hypertensive gastropathy (PHG), portal hypertensive enteropathy(PHE), and internal hemorrhoid[31-34].

***Spontaneous bacterial peritonitis and other infections***

Refer to the relevant Chinese guidelines for the diagnosis[6]. In addition to spontaneous bacterial peritonitis, common infections in patients with cirrhosis include urinary, biliary, gastrointestinal, respiratory, skin soft tissue infections, and sepsis.

***Hepatic encephalopathy***

Refer to the relevant Chinese guidelines for the diagnosis[7].

***Renal impairment***

Renal impairment in cirrhosis patients includes acute kidney injury (AKI), hepatorenal syndrome-acute kidney injury (HRS-AKI), HRS-non-AKI (HRS-NAKI), and chronic kidney disease (CKD)[35,36].

The diagnosis of AKI is based on either of the two criteria[37]: serum creatinine (Scr) within 48 h after admission increases ≥ 26.5 μmol/L (0.3 mg/dL) from baseline, or Scr within 7 d increases ≥ 50% from baseline (last available Scr within 3 mo can be taken as the baseline value).

The diagnostic criteria of HRS-AKI are as follows: (1) patients with cirrhosis and ascites; (2) patients meeting the criteria for AKI; (3) no response after discontinuing diuretics and plasma volume expansion by intravenous infusion of ALB at a dose of 1 g/kg for 48 h; (4) no shock; (5) patients not using nephrotoxic drugs currently or recently; and (6) no signs of renal structural injury: (a) no proteinuria (< 500 mg/d); (b) no minor hematuria (< 50 red blood cells per high power field); and (c) normal sonography of the kidneys.

HRS-NAKI[38] (including HRS-AKD and HRS-CKD) is diagnosed if: (1) patients have cirrhosis with or without ascites; (2) HRS-AKI is excluded; and (3) estimated glomerular filtration rate (eGFR) < 60 mL/min/1.73 m2 in the absence of structural injury or Scr increases by < 50% from baseline (last available Scr within 3 mo can be taken as the baseline value).

CKD is defined as an eGFR level of < 60 mL/min/1.73 m2 for 3 mo regardless of the structural injury of the kidneys.

***Cirrhotic cardiomyopathy***

Cirrhotic cardiomyopathy (CCM) is cardiac dysfunction characterized by suboptimal contractile response to stress and impaired diastolic function in the absence of previous cardiac diseases[39,40]. Given that most patients are asymptomatic in the initial stages of CCM, clinical, laboratory, electrocardiographic and imaging evaluations are necessary for early diagnosis. Diagnostic criteria of CCM are as follows: (1) systolic dysfunction characterized by no increase of cardiac output induced by physical or pharmacological stress; (2) diastolic dysfunction[41]: E/A ratio < 1.0, deceleration time > 200 ms, and isovolumic relaxation time > 80 ms; and (3) supporting criteria: Electrophysiology abnormality, myocardial chronotropism, QT interval prolongation, non-synchronous electromechanical systole, left atrial enlargement, myocardial hypertrophy, brain natriuretic peptide and its precursor increased, and troponin increased.

***Hepatopulmonary syndrome***

Diagnostic criteria of hepatopulmonary syndrome (HPS) are detailed in the International liver transplant society practice guidelines: Diagnosis and management of HPS and portopulmonary hypertension 2016[42].

***Other complications of cirrhosis***

Other complications of cirrhosis include portal vein thrombosis (PVT) which can be classified into acute and chronic PVT[43-45], primary liver cancer[46], hepatic osteopathy[47] and cirrhotic amyotrophy[48,49].

**Recommendation 4:** AKI diagnosis: Scr within 48 h after admission increases by ≥ 26.5 μmol/L (0.3 mg/dL) from baseline, or Scr within 7 d increases by ≥ 50% than last available Scr within 3 mo or from the baseline value (B, 1). CKD diagnosis: regardless of structural injury of the kidneys, eGFR < 60 mL/min/1.73 m2 lasts longer than 3 mo, and patients have refractory ascites (B, 1).

**Recommendation 5:** HRS-AKI diagnosis: (1) cirrhosis and ascites; (2) AKI; (3) no response after discontinuing diuretics and supplementing ALB (20-40 g/d) and expanding the blood volume for 48 h; (4) no shock; (5) no use of nephrotoxic drugs currently or recently; and (6) no evidence of structural injury of the kidneys (A, 1).

**Recommendation 6:** Diagnosis of HRS-NAKI: (1) cirrhosis with or without ascites; (2) HRS-AKI is excluded; and (3) eGFR < 60 mL/min/1.73 m2 in the absence of structural injury or Scr increases by < 50% from baseline (last available Scr within 3 mo can be taken as the baseline value) (C, 1).

**Recommendation 7:** The incidence of abnormal electrophysiology in patients with cirrhosis is high, and screening and monitoring of cirrhotic cardiomyopathy should be emphasized (C, 1).

**Recommendation 8:** PVT includes acute and chronic PVT (B, 1).

**Recommendation 9:** Once cirrhosis is diagnosed, it is necessary to closely screen liver cancer (B, 1) by sonography and AFP test every 3-6 mo (C, 1).

**Recommendation 10:** Cirrhotic osteoporosis is positively correlated with the severity of liver disease. Bone density should be monitored in patients who are newly diagnosed with PBC or cirrhosis and in those after liver transplantation. Moreover, bone density should also be monitored in patients with a history of fragility fracture, postmenopausal women and those who use glucocorticoids in the long term (> 3 mo) (B, 2).

**Treatment of cirrhosis**

When patients are diagnosed with cirrhosis, comprehensive treatments should be commenced as soon as possible. If feasible, etiological treatment should be started immediately. Anti-inflammation and anti-hepatic fibrosis therapy are options for those who present persistent inflammation and/or fibrosis but are not suitable for or do not respond to etiological treatment. Prevention and treatment of complications play an important role in extending lifespan and improving life quality of patients with cirrhosis.

***Etiological treatment***

Etiological treatment is key for the treatment of cirrhosis whenever feasible. Detailed recommendations can be found in relevant Chinese guidelines[50-53] and Consensus[54-56]. In terms of immunoglobulin G4-associated cholangitis, immunosuppressant, interventional therapies or surgical intervention may be indicated[57].

D-penicillamine and trientine is indicated in cirrhosis patients due to Wilson’s disease. In addition, these patients should avoid the intake of copper-rich foods. Oral zinc formulations (*e.g.*, zinc acetate, zinc gluconate) are recommended to reduce copper absorption[58,59].

For cirrhosis patients due to hemochromatosis, it is necessary to restrict the intake of iron-rich food and prohibit the transfusion of red blood cells. Other options include therapeutic venesection and iron chelators (*e.g.*, deferoxamine or deferasirox)[60].

Treatment of drug-induced cirrhosis is detailed in diagnosis and treatment guidelines on drug-induced liver injury[61].

***Anti-inflammation and anti-hepatic fibrosis therapy***

Anti-inflammation and anti-hepatic fibrosis therapy are indicated when patients present persistent inflammation and/or fibrosis but are not suitable for or do not respond to etiological treatment. The most commonly used anti-inflammation drugs include glycyrrhizic acid preparation, bicyclol, polyene phosphatidyl choline, silymarin, ademetionine and reduced glutathione[62]. Anti-fibrosis medicines include Anluohuaxian capsule, Fuzheng huayu capsule, and compound Biejiaruangan tablet[63-66].

***Prevention and treatment of complications***

**Ascites:** Refer to the Chinese guidelines on the management of ascites and its related complications in cirrhosis[6]. Combination of diuretics, ALB, and vasoconstrictor is recommended to treat refractory ascites.

For patients with chylous ascites, nutritional support with a low-salt, low-fat, medium chain triglyceride and high-protein diet and management of the underlying etiology are the cornerstones of therapy. When these measures fail, other interventions such as octreotide/somatostatin analogues, terlipressin, surgical ligation, embolization and transjugular, intrahepatic, portosystemic shunt (TIPS) can be considered[67-69]

For patients with hemorrhagic ascites, the key therapy is to control the basic causes[70,71]. When these measures fail, terlipressin and somatostatin can be used.

The treatment for cirrhotic patients with pleural effusion is similar to that for cirrhotic ascites. Treatment for chylous pleural effusion is similar to that for chylous ascites.

**Gastrointestinal bleeding:** Refer to Guidelines for the Diagnosis and Treatment of Esophageal and Gastric Variceal Bleeding in Cirrhotic Portal Hypertension 2016[5]. (1) Esophagogastric variceal bleeding, terlipressin, somatostatin and its analogs, and pituitrin are used to treat patients with esophagogastric variceal bleeding. When drug therapy fails, other interventions can be considered including a Sengstaken-Blakemore tube, endoscopic variceal ligation or tissue glue injection, TIPS, and surgical therapy. High-risk patients with acute hemorrhage should receive TIPS therapy as early as possible (within 72 h). Balloon-occluded retrograde transvenous obliteration is preferred in patients with gastric variceal bleeding[72]; (2) PHG and PHE bleeding: non-selective beta blocker (NSBB) is preferred to treat patients with bleeding due to PHG and PHE, and iron supplement is recommended[73,74]. Terlipressin, somatostatin, and its analogs can be considered[75-77].

**Infections:** Refer to the Chinese guidelines on the management of ascites and its related complications in cirrhosis[6] and Expert Consensus on Diagnosis and Treatment of End-stage Liver Diseases Complicated With Infections[78].

Norepinephrine is a first-line vasoactive drug for the treatment of infective shock. Bothe the dose of catecholamines and the risk of cardiac arrhythmia can be reduced when vasopressin (maximum dose 0.03 U/min) is added to norepinephrine[79]. With a longer half-life and similar effect, terlipressin is more effective in raising blood pressure and is more long-acting.

For patients with sepsis and severe infection, high-dose ALB can be combined with antibacterial agents.

**Hepatic encephalopathy:** Refer to the Guidelines on the management of hepatic encephalopathy in cirrhosis 2018[7].

**Renal impairment:** Refer to the Chinese guidelines on the management of ascites and its related complications in cirrhosis[6] and the Guidelines for Diagnosis and Treatment of Liver Failure (2018)[80].

Terlipressin combined with ALB is superior to placebo, ALB alone, octreotide or triple therapy with midodrine, octreotide and ALB in reversing HRS-AKI and HRS-NAKI and improving renal function[81-87]. Terlipressin at a dose of 1 mg per 4-6 h can be administered in combination with ALB (20-40 g per d) for 3 d. With a < 25% decrease of Scr level, the dose of terlipressin can gradually increase to 2 mg per 4 h. If effective (Scr decreases to < 133 μmol/L, along with the increase of arterial pressure, urine output and serum sodium level), the treatment duration is 7-14 d. Otherwise, terlipressin is discontinued. Norepinephrine (0.5-3.0 mg/h) in combination with ALB (10-20 g/L) can also be used.

TIPS can improve the renal function of patients with HRS-AKI and HRS-NAKI[88]. However, there are usually contraindications for TIPS in patients with HRS-AKI. Blood purification therapy can improve the renal function of some HRS-AKI patients. Liver transplantation is the preferred treatment for HRS-AKI and HRS-NAKI.

**Cirrhotic cardiomyopathy:** Current pharmacological treatment is not specific. Liver transplantation is the only proven treatment with specific effect on CCM[40,89].

**HPS**: Other than long-term supplemental oxygen, there are no effective therapies for HPS currently. The only definitive therapy is liver transplantation. Thus patients with HPS are recommended for liver transplant evaluation[90,91].

**Portal vein thrombosis:** Anticoagulant therapy or thrombolytic therapy can be adopted for patients with cirrhotic acute PVT. Low-molecular-weight heparin is preferred. Warfarin can be considered. Treatment duration ranges from 3 to 6 mo. Other interventions include TIPS, thrombolysis, and surgery. Individualized treatment is required for the treatment of chronic PVT[92-94].

**Hepatic osteopathy:** Diphosphonate can be used in patients with osteoporosis on the basis of calcium preparation and vitamin D. Oral alendronate sodium may lead to variceal bleeding. Zoledronic acid, a new intravenous bisphosphonate is effective in reducing fracture risk and does not have risk of variceal bleeding[95-98].

**Nutritional support:** Refer to the Clinical guidelines on nutrition in end-stage liver disease 2019, *etc*[7,23].

Nursing of digestive tract hemorrhage.

**Recommendation 11:** Etiological treatment is the key. If etiological treatment is not available or hepatic fibrosis persists or deteriorates after etiological treatment, anti-fibrosis therapy, such as Anluohuaxian capsule, Fuzhenghuayu capsule, and compound Biejiaruangan tablet can be used (B, 1).

**Recommendation 12:** In terms of refractory ascites, triple therapy including diuretics, ALB, and vasoconstrictors is recommended (B, 1).

**Recommendation 13:** In terms of cirrhotic chylous ascites or chylous pleural effusion, a low-salt, low-fat, medium chain triglyceride high-protein diet is recommended (B, 1). Terlipressin and somatostatin may be used (B, 2). A portal-systemic shunt procedure can be performed. If indicated, surgical intervention can be performed (C, 1).

**Recommendation 14:** For cirrhosis patients with hemorrhagic ascites, the primary treatment is to control the underlying causes. Terlipressin and somatostatin can be used (B, 2).

**Recommendation 15:** In the case of cirrhotic upper gastrointestinal hemorrhage, terlipressin, somatostatin analogs, proton pump inhibitor or H2 receptor blocker can be used (A, 1).

**Recommendation 16:** If drugs fail in treating cirrhotic esophageal and gastric variceal bleeding, the Sengstaken-Blakemore tube, endoscopic variceal ligation or tissue glue injection (B, 1), interventional therapies (C, 1) and surgery (C, 2) can be performed.

**Recommendation 17:** At 5 to 7 d after stopping cirrhotic gastrointestinal bleeding, secondary prevention should be performed with NSBB (A, 1) or carvedilol (B, 1). In patients with gastrointestinal bleeding and ascites, carvedilol is not recommended and the dose of NSBB should be reduced (B, 2).

**Recommendation 18:** In patients with PHG bleeding, NSBB and iron preparations are recommended (B; 1). In the case of acute hemorrhage, terlipressin or somatostatin analogs can be used (B; 2).

**Recommendation 19:** In cirrhosis patients with infections, empirical anti-infective therapy should be started as soon as possible. Based on the etiological results, switch to target therapy as soon as possible (B, 1).

**Recommendation 20:** In the case of sepsis, severe infection or shock, it is recommended to adopt triple therapy including antibacterial agents, ALB, and vasoactive drugs (B, 1).

**Recommendation 21:** HRS can be treated with terlipressin (1 mg/4-6 h) in combination with ALB (20-40 g/d) for 7 - 14 d, and the therapy can be repeated if HRS recurs (B, 1).

**Recommendation 22:** For HRS-NAKI patients with a large amount of ascites who do not respond to vasoconstrictors, TIPS can be performed (B, 1). TIPS is not recommended for HRS-AKI patients (C, 1).

**Recommendation 23:** For HRS-AKI patients who do not respond to vasoconstrictors, renal replacement therapy or artificial liver support can be selected. It is not recommended to perform renal replacement therapy in HRS-NAKI patients. HRS-AKI and HRS-NAKI patients should be preferentially included into the liver transplantation plan (B, 1).

**Recommendation 24:** There is no effective drug for cirrhotic cardiomyopathy. Patients should be included into the liver transplantation plan (B, 1).

**Recommendation 25:** There is no effective drug for HPS. Long-term supplemental oxygen is recommended (C, 1). Patients should be included into the liver transplantation plan (B, 1).

**Recommendation 26:** Anticoagulant therapy or thrombolytic therapy can be adopted for patients with acute PVT and progressive PVT(C, 1). Low-molecular-weight heparin alone or in combination with warfarin may be used (A, 1).

**Recommendation 27:** In terms of hepatic osteopathy or osteoporosis, bisphosphonates can be used on the basis of calcium preparation and vitamin D (C, 2). Nutritional support is important (B, 1).

**Problems to be solved**

***Test technology***

(1) Smart reader of hepatic pathology; (2) non-invasive monitoring of HVPG; (3) new tools of liver stiffness measurement regardless of ascites, jaundice or inflammation; and (4) specific and sensitive test of MHE.

***Diagnostic method and criteria***

(1) Clarification of diagnostic criteria for recompensation and cirrhosis reversion; and (2) early identification and diagnosis of HRS.

***Therapeutic and preventive measures***

(1) Evaluation of traditional Chinese medicine in anti-hepatic fibrosis and anti-cirrhosis; (2) evaluation of diuretics, ALB, and vasoactive drugs in refractory ascites; (3) evaluation of antibacterial agents, ALB, and vasoactive drugs in sepsis and severe infections; and (4) primary and secondary prevention of cirrhotic upper gastrointestinal hemorrhage.

**CONCLUSION**

Liver cirrhosis is a substantial health burden worldwide. To promote diagnosis and treatment of cirrhosis, the CSH and the CSG of CMA developed the Chinese Guidelines for the diagnosis and treatment of cirrhosis complications including esophageal and gastric variceal bleeding, ascites, and hepatic encephalopathy recently[5-7]. However, there is a great need for updates with the development in these areas. In addition, some important topics, especially those on rare complications, have not been covered in those guidelines. Therefore, the present guidelines adds new sections and provides updates, focusing on the early identification of the causes, evaluation of disease severity, comprehensive assessment of complications, etiological treatment, and complication management. Lastly, problems to be solved are addressed.

**ACKNOWLEDGEMENTS**

We thank all members of the Chinese Society of Hepatology, Chinese Medical Association. The Expert Group members (in order by the Pinyin Romanization of the individual’s last name) include: Ji-Hong An, Guo-Feng Chen, Hong-Song Chen, Jing-Long Chen, Yu Chen, Jun Cheng, Guo-Hong Deng, Hui-Guo Ding, Lei Dong, Xiao-Guang Dou, Zhong-Ping Duan, Hui Gao, Yan-Hang Gao, Tao Han, Ying Han, Ying Han, Jin-Hua Hu, Yuan Huang, Ji-Dong Jia, Jian-Ning Jiang, Ying-An Jiang, Hong-Bin Kong, Yuan-Yuan Kong, Cang-You Li, Jie Li, Jun Li, Qing-Hong Li, Rong-Kuan Li, Shu-Chen Li, Tai-Sheng Li, Wen-Gang Li, Wu Li, Yu-Fang Li, Shu-Mei Lin, En-Qiang Ling-Hu, Bin-Bin Liu, Jing-Fu Liu, Xiao-Qing Liu, Ying-Di Liu, Yu-Lan Liu, Hai-Ying Lu, Lun-Gen Lu, Xin-Hua Luo, Qing-Hua Lu, Xiong Ma, Yue-Min Nan, Yu-Qiang Nie, Jun-Qi Niu, Hui-Ying Rao, Hong Ren, Wan-Hua Ren, Jia Shang, Li Shi, Lei Wang, Xian-Bo Wang, Yu-Ming Wang, Lai Wei, Xiao-Ping Wu, Chao Wu, Jing Wu, Wen Xie, Shao-Jie Xin, Hui-Chun Xing, Jie Xu, Jing-Hang Xu, Xiao-Yuan Xu, You-Qing Xu, Ming Yan, Bao-Shan Yang, Dong-Liang Yang, Ji-Ming Yang, Jin-Hui Yang, Li Yang, Yong-Feng Yang, Yong-Ping Yang, Chang-Qing Yang, Hong You, Yan-Yan Yu, Zheng Zeng, Suo-Di Zhai, Chun-Qing Zhang, Da-Zhi Zhang, Li-Ting Zhang, Liao-Yun Zhang, Ling-Yi Zhang, Lun-Li Zhang, Xin-Xin Zhang, Jing-Min Zhao, Ping Zhao, Shou-Song Zhao, Huan-Wei Zheng, Jun-Ying Zhou, Yong-Jian Zhou, Hui Zhuang, Wei-Ze Zuo. Academic secretaries are: Qian Kang, Jia-Li Pan.

**REFERENCES**

1 **Asrani SK**, Devarbhavi H, Eaton J, Kamath PS. Burden of liver diseases in the world. *J Hepatol* 2019; **70**: 151-171 [PMID: 30266282 DOI: 10.1016/j.jhep.2018.09.014]

2 **European Association for the Study of the Liver.** Electronic address: easloffice@easloffice.eu.; European Association for the Study of the Liver. EASL Clinical Practice Guidelines for the management of patients with decompensated cirrhosis. *J Hepatol* 2018; **69**: 406-460 [PMID: 29653741 DOI: 10.1016/j.jhep.2018.03.024]

3 **European Association for the Study of the Liver**. EASL clinical practice guidelines on the management of ascites, spontaneous bacterial peritonitis, and hepatorenal syndrome in cirrhosis. *J Hepatol* 2010; **53**: 397-417 [PMID: 20633946 DOI: 10.1016/j.jhep.2010.05.004]

4 **Runyon BA**; AASLD. Introduction to the revised American Association for the Study of Liver Diseases Practice Guideline management of adult patients with ascites due to cirrhosis 2012. *Hepatology* 2013; **57**: 1651-1653 [PMID: 23463403 DOI: 10.1002/hep.26359]

5 **Chinese Society of Hepatology,** Chinese Medical Association; Chinese Society of Gastroenterology, Chinese Medical Association; Chinese Society of Endoscopy, Chinese Medical Association. Guideline for the diagnosis and treatment of esophageal and gastric variceal bleeding in cirrhotic portal hypertension. *Zhonghua Neike Zazhi* 2016; **55**: 57-72 [DOI: 10.3760/cma.j.issn.0578-1426.2016.01.015]

6 **Chinese Society of Hepatology,** Chinese Medical Association., Xu X, Duan Z, Ding H, Li W, Jia J, Wei L, Linghu E, Zhuang H. Chinese guidelines on the management of ascites and its related complications in cirrhosis. *Hepatol Int* 2019; **13**: 1-21 [PMID: 30656520 DOI: 10.1007/s12072-018-09923-2]

7 **Chinese Society of Hepatology,** Chinese Medical Association. [Guidelines on the management of hepatic encephalopathy in cirrhosis]. *Zhonghua Neike Zazhi* 2018; **57**: 705-718 [PMID: 30293330 DOI: 10.3760/cma.j.issn.0578-1426.2018.10.004]

8 **Alonso-Coello P**, Schünemann HJ, Moberg J, Brignardello-Petersen R, Akl EA, Davoli M, Treweek S, Mustafa RA, Rada G, Rosenbaum S, Morelli A, Guyatt GH, Oxman AD; GRADE Working Group. GRADE Evidence to Decision (EtD) frameworks: a systematic and transparent approach to making well informed healthcare choices. 1: Introduction. *BMJ* 2016; **353**: i2016 [PMID: 27353417 DOI: 10.1136/bmj.i2016]

9 **Berzigotti A**, Abraldes JG. Impact of obesity and insulin-resistance on cirrhosis and portal hypertension. *Gastroenterol Hepatol* 2013; **36**: 527-533 [PMID: 23731977 DOI: 10.1016/j.gastrohep.2013.03.005]

10 **Berzigotti A**, Albillos A, Villanueva C, Genescá J, Ardevol A, Augustín S, Calleja JL, Bañares R, García-Pagán JC, Mesonero F, Bosch J; Ciberehd SportDiet Collaborative Group. Effects of an intensive lifestyle intervention program on portal hypertension in patients with cirrhosis and obesity: The SportDiet study. *Hepatology* 2017; **65**: 1293-1305 [PMID: 27997989 DOI: 10.1002/hep.28992]

11 **Parker R**, Kim SJ, Im GY, Nahas J, Dhesi B, Vergis N, Sinha A, Ghezzi A, Rink MR, McCune A, Aithal GP, Newsome PN, Weston CJ, Holt A, Gao B. Obesity in acute alcoholic hepatitis increases morbidity and mortality. *EBioMedicine* 2019; **45**: 511-518 [PMID: 31278069 DOI: 10.1016/j.ebiom.2019.03.046]

12 **Montano-Loza AJ**, Angulo P, Meza-Junco J, Prado CM, Sawyer MB, Beaumont C, Esfandiari N, Ma M, Baracos VE. Sarcopenic obesity and myosteatosis are associated with higher mortality in patients with cirrhosis. *J Cachexia Sarcopenia Muscle* 2016; **7**: 126-135 [PMID: 27493866 DOI: 10.1002/jcsm.12039]

13 **Hara N**, Iwasa M, Sugimoto R, Mifuji-Moroka R, Yoshikawa K, Terasaka E, Hattori A, Ishidome M, Kobayashi Y, Hasegawa H, Iwata K, Takei Y. Sarcopenia and Sarcopenic Obesity Are Prognostic Factors for Overall Survival in Patients with Cirrhosis. *Intern Med* 2016; **55**: 863-870 [PMID: 27086797 DOI: 10.2169/internalmedicine.55.5676]

14 **Abbas M**, Abbas Z. Serum cholinesterase: A predictive biomarker of hepatic reserves in chronic hepatitis D. *World J Hepatol* 2017; **9**: 967-972 [PMID: 28839517 DOI: 10.4254/wjh.v9.i22.967]

15 **Anthony PP**, Ishak KG, Nayak NC, Poulsen HE, Scheuer PJ, Sobin LH. The morphology of cirrhosis: definition, nomenclature, and classification. *Bull World Health Organ* 1977; **55**: 521-540 [PMID: 304393]

16 **Malinchoc M**, Kamath PS, Gordon FD, Peine CJ, Rank J, ter Borg PC. A model to predict poor survival in patients undergoing transjugular intrahepatic portosystemic shunts. *Hepatology* 2000; **31**: 864-871 [PMID: 10733541 DOI: 10.1053/he.2000.5852]

17 **He YB**, Bai L, Jiang Y, Ji XW, Tai QW, Zhao JM, Zhang JH, Liu WY, Wen H. Application of a Three-Dimensional Reconstruction Technique in Liver Autotransplantation for End-Stage Hepatic Alveolar Echinococcosis. *J Gastrointest Surg* 2015; **19**: 1457-1465 [PMID: 25967139 DOI: 10.1007/s11605-015-2842-z]

18 **Cai W**, Fan Y, Hu H, Xiang N, Fang C, Jia F. Postoperative liver volume was accurately predicted by a medical image three dimensional visualization system in hepatectomy for liver cancer. *Surg Oncol* 2017; **26**: 188-194 [PMID: 28577725 DOI: 10.1016/j.suronc.2017.03.006]

19 **Chinese Foundation for Hepatitis Prevention and Control**; Chinese Society of Infectious Disease and Chinese Society of Hepatology, Chinese Medical Association; Liver Disease Committee of Chinese Research Hospital Association. [Consensus on clinical application of transient elastography detecting liver fibrosis: a 2018 update]. *Zhonghua Gan Zang Bing Za Zhi* 2019; **27**: 182-191 [PMID: 30929334 DOI: 10.3760/cma.j.issn.1007-3418.2019.03.004]

20 **Deniz K**, Özcan S, Özbakır Ö, Patıroğlu TE. Regression of steatohepatitis-related cirrhosis. *Semin Liver Dis* 2015; **35**: 199-202 [PMID: 25974904 DOI: 10.1055/s-0035-1550058]

21 **Bedossa P**, Poynard T. An algorithm for the grading of activity in chronic hepatitis C. The METAVIR Cooperative Study Group. *Hepatology* 1996; **24**: 289-293 [PMID: 8690394 DOI: 10.1002/hep.510240201]

22 **Chinese Portal Hypertension Diagnosis and Monitoring Study Group (CHESS)**; Minimally Invasive Intervention Collaborative Group, Chinese Society of Gastroenterology; Emergency Intervention Committee, Chinese College of Interventionalists; Hepatobiliary Diseases Collaborative Group, Chinese Society of Gastroenterology; Spleen and Portal Hypertension Group, Chinese Society of Surgery; Fatty Liver and Alcoholic Liver Disease Group, Chineses Society of Hepatology; Chinese Research Hospital Association for the Study of the Liver; Hepatobiliary and Pancreatic Diseases Prevention and Control Committee, Chinese Preventive Medicine Association; Chinese Society of Digital Medicine; Chinese Society of Clinical Epidemiology and Evidence Based Medicine. [Consensus on clinical application of hepatic venous pressure gradient in China (2018)]. *Zhonghua Gan Zang Bing Za Zhi* 2018; **26**: 801-812 [PMID: 30616313 DOI: 10.3760/cma.j.issn.1007-3418.2018.11.001]

23 **Chinese Society of Hepatology,** Chinese Medical Association; Chinese Society of Gastroenterology, Chinese Medical Association. [Clinical guidelines on nutrition in end-stage liver disease]. *Zhonghua Gan Zang Bing Za Zhi* 2019; **27**: 330-342 [PMID: 31177656 DOI: 10.3760/cma.j.issn.1007-3418.2019.05.003]

24 **Lo RC**, Kim H. Histopathological evaluation of liver fibrosis and cirrhosis regression. *Clin Mol Hepatol* 2017; **23**: 302-307 [PMID: 29281870 DOI: 10.3350/cmh.2017.0078]

25 **Buti M**, Fung S, Gane E, Afdhal NH, Flisiak R, Gurel S, Flaherty JF, Martins EB, Yee LJ, Dinh P, Bornstein JD, Mani Subramanian G, Janssen HL, George J, Marcellin P. Long-term clinical outcomes in cirrhotic chronic hepatitis B patients treated with tenofovir disoproxil fumarate for up to 5 years. *Hepatol Int* 2015; **9**: 243-250 [PMID: 25788199 DOI: 10.1007/s12072-015-9614-4]

26 **Kong Y**, Sun Y, Zhou J, Wu X, Chen Y, Piao H, Lu L, Ding H, Nan Y, Jiang W, Xu Y, Xie W, Li H, Feng B, Shi G, Chen G, Li H, Zheng H, Cheng J, Wang T, Liu H, Lv F, Shao C, Mao Y, Sun J, Chen T, Han T, Han Y, Wang L, Ou X, Zhang H, Jia J, You H. Early steep decline of liver stiffness predicts histological reversal of fibrosis in chronic hepatitis B patients treated with entecavir. *J Viral Hepat* 2019; **26**: 576-585 [PMID: 30624000 DOI: 10.1111/jvh.13058]

27 **Russo FP**, Zanetto A, Campello E, Bulato C, Shalaby S, Spiezia L, Gavasso S, Franceschet E, Radu C, Senzolo M, Burra P, Lisman T, Simioni P. Reversal of hypercoagulability in patients with HCV-related cirrhosis after treatment with direct-acting antivirals. *Liver Int* 2018; **38**: 2210-2218 [PMID: 29738632 DOI: 10.1111/liv.13873]

28 **Grgurevic I**, Bozin T, Madir A. Hepatitis C is now curable, but what happens with cirrhosis and portal hypertension afterwards? *Clin Exp Hepatol* 2017; **3**: 181-186 [PMID: 29255805 DOI: 10.5114/ceh.2017.71491]

29 **Marcellin P**, Asselah T. Long-term therapy for chronic hepatitis B: hepatitis B virus DNA suppression leading to cirrhosis reversal. *J Gastroenterol Hepatol* 2013; **28**: 912-923 [PMID: 23573915 DOI: 10.1111/jgh.12213]

30 **Garbuzenko DV**, Arefyev NO. Hepatic hydrothorax: An update and review of the literature. *World J Hepatol* 2017; **9**: 1197-1204 [PMID: 29152039 DOI: 10.4254/wjh.v9.i31.1197]

31 **Reiberger T**, Püspök A, Schoder M, Baumann-Durchschein F, Bucsics T, Datz C, Dolak W, Ferlitsch A, Finkenstedt A, Graziadei I, Hametner S, Karnel F, Krones E, Maieron A, Mandorfer M, Peck-Radosavljevic M, Rainer F, Schwabl P, Stadlbauer V, Stauber R, Tilg H, Trauner M, Zoller H, Schöfl R, Fickert P. Austrian consensus guidelines on the management and treatment of portal hypertension (Billroth III). *Wien Klin Wochenschr* 2017; **129**: 135-158 [PMID: 29063233 DOI: 10.1007/s00508-017-1262-3]

32 **Smith E**, Tekola B, Patrie J, Cornella S, Caldwell S. Clinical Characterization of Gastric Antral Vascular Ectasia: A Potential Manifestation of the Metabolic Syndrome. *Am J Med* 2016; **129**: 1329.e19-1329.e23 [PMID: 27476085 DOI: 10.1016/j.amjmed.2016.07.007]

33 **Tsai CJ**, Sanaka MR, Menon KV, Vargo JJ. Balloon-assisted enteroscopy in portal hypertensive enteropathy. *Hepatogastroenterology* 2014; **61**: 1635-1641 [PMID: 25436355]

34 **De Palma GD**, Rega M, Masone S, Persico F, Siciliano S, Patrone F, Matantuono L, Persico G. Mucosal abnormalities of the small bowel in patients with cirrhosis and portal hypertension: a capsule endoscopy study. *Gastrointest Endosc* 2005; **62**: 529-534 [PMID: 16185966 DOI: 10.1016/s0016-5107(05)01588-9]

35 **Angeli P**, Garcia-Tsao G, Nadim MK, Parikh CR. News in pathophysiology, definition and classification of hepatorenal syndrome: A step beyond the International Club of Ascites (ICA) consensus document. *J Hepatol* 2019; **71**: 811-822 [PMID: 31302175 DOI: 10.1016/j.jhep.2019.07.002]

36 **Rosi S**, Piano S, Frigo AC, Morando F, Fasolato S, Cavallin M, Gola E, Romano A, Montagnese S, Sticca A, Gatta A, Angeli P. New ICA criteria for the diagnosis of acute kidney injury in cirrhotic patients: can we use an imputed value of serum creatinine? *Liver Int* 2015; **35**: 2108-2114 [PMID: 25900355 DOI: 10.1111/liv.12852]

37 **Angeli P**, Ginès P, Wong F, Bernardi M, Boyer TD, Gerbes A, Moreau R, Jalan R, Sarin SK, Piano S, Moore K, Lee SS, Durand F, Salerno F, Caraceni P, Kim WR, Arroyo V, Garcia-Tsao G. Diagnosis and management of acute kidney injury in patients with cirrhosis: revised consensus recommendations of the International Club of Ascites. *J Hepatol* 2015; **62**: 968-974 [PMID: 25638527 DOI: 10.1016/j.jhep.2014.12.029]

38 **Patidar KR**, Kang L, Bajaj JS, Carl D, Sanyal AJ. Fractional excretion of urea: A simple tool for the differential diagnosis of acute kidney injury in cirrhosis. *Hepatology* 2018; **68**: 224-233 [PMID: 29315697 DOI: 10.1002/hep.29772]

39 **Wehmeyer MH**, Heuer AJ, Benten D, Püschel K, Sydow K, Lohse AW, Lüth S. High Rate of Cardiac Abnormalities in a Postmortem Analysis of Patients Suffering From Liver Cirrhosis. *J Clin Gastroenterol* 2015; **49**: 866-872 [PMID: 25856382 DOI: 10.1097/MCG.0000000000000323]

40 **Wiese S**, Hove JD, Bendtsen F, Møller S. Cirrhotic cardiomyopathy: pathogenesis and clinical relevance. *Nat Rev Gastroenterol Hepatol* 2014; **11**: 177-186 [PMID: 24217347 DOI: 10.1038/nrgastro.2013.210]

41 **Nagueh SF**, Smiseth OA, Appleton CP, Byrd BF 3rd, Dokainish H, Edvardsen T, Flachskampf FA, Gillebert TC, Klein AL, Lancellotti P, Marino P, Oh JK, Alexandru Popescu B, Waggoner AD; Houston, Texas; Oslo, Norway; Phoenix, Arizona; Nashville, Tennessee; Hamilton, Ontario, Canada; Uppsala, Sweden; Ghent and Liège, Belgium; Cleveland, Ohio; Novara, Italy; Rochester, Minnesota; Bucharest, Romania; and St. Louis, Missouri. Recommendations for the Evaluation of Left Ventricular Diastolic Function by Echocardiography: An Update from the American Society of Echocardiography and the European Association of Cardiovascular Imaging. *Eur Heart J Cardiovasc Imaging* 2016; **17**: 1321-1360 [PMID: 27422899 DOI: 10.1093/ehjci/jew082]

42 **Krowka MJ**, Fallon MB, Kawut SM, Fuhrmann V, Heimbach JK, Ramsay MA, Sitbon O, Sokol RJ. International Liver Transplant Society Practice Guidelines: Diagnosis and Management of Hepatopulmonary Syndrome and Portopulmonary Hypertension. *Transplantation* 2016; **100**: 1440-1452 [PMID: 27326810 DOI: 10.1097/TP.0000000000001229]

43 **Sarin SK**, Philips CA, Kamath PS, Choudhury A, Maruyama H, Nery FG, Valla DC. Toward a Comprehensive New Classification of Portal Vein Thrombosis in Patients With Cirrhosis. *Gastroenterology* 2016; **151**: 574-577.e3 [PMID: 27575821 DOI: 10.1053/j.gastro.2016.08.033]

44 **European Association for the Study of the Liver.** Electronic address: easloffice@easloffice.eu. EASL Clinical Practice Guidelines: Vascular diseases of the liver. *J Hepatol* 2016; **64**: 179-202 [PMID: 26516032 DOI: 10.1016/j.jhep.2015.07.040]

45 **Intagliata NM**, Caldwell SH, Tripodi A. Diagnosis, Development, and Treatment of Portal Vein Thrombosis in Patients With and Without Cirrhosis. *Gastroenterology* 2019; **156**: 1582-1599.e1 [PMID: 30771355 DOI: 10.1053/j.gastro.2019.01.265]

46 **Zhou J**, Sun HC, Wang Z, Cong WM, Wang JH, Zeng MS, Yang JM, Bie P, Liu LX, Wen TF, Han GH, Wang MQ, Liu RB, Lu LG, Ren ZG, Chen MS, Zeng ZC, Liang P, Liang CH, Chen M, Yan FH, Wang WP, Ji Y, Cheng WW, Dai CL, Jia WD, Li YM, Li YX, Liang J, Liu TS, Lv GY, Mao YL, Ren WX, Shi HC, Wang WT, Wang XY, Xing BC, Xu JM, Yang JY, Yang YF, Ye SL, Yin ZY, Zhang BH, Zhang SJ, Zhou WP, Zhu JY, Liu R, Shi YH, Xiao YS, Dai Z, Teng GJ, Cai JQ, Wang WL, Dong JH, Li Q, Shen F, Qin SK, Fan J. Guidelines for Diagnosis and Treatment of Primary Liver Cancer in China (2017 Edition). *Liver Cancer* 2018; **7**: 235-260 [PMID: 30319983 DOI: 10.1159/000488035]

47 **Zhang W**, Gong H, Su Z, Zhang X, Cao S. Risk factors associated with hepatic osteopathy in HBV related cirrhosis measured by liver stiffness: An Observational study. *Medicine (Baltimore)* 2019; **98**: e16628 [PMID: 31374030 DOI: 10.1097/MD.0000000000016628]

48 **Kim G**, Kang SH, Kim MY, Baik SK. Prognostic value of sarcopenia in patients with liver cirrhosis: A systematic review and meta-analysis. *PLoS One* 2017; **12**: e0186990 [PMID: 29065187 DOI: 10.1371/journal.pone.0186990]

49 **Giusto M**, Lattanzi B, Albanese C, Galtieri A, Farcomeni A, Giannelli V, Lucidi C, Di Martino M, Catalano C, Merli M. Sarcopenia in liver cirrhosis: the role of computed tomography scan for the assessment of muscle mass compared with dual-energy X-ray absorptiometry and anthropometry. *Eur J Gastroenterol Hepatol* 2015; **27**: 328-334 [PMID: 25569567 DOI: 10.1097/MEG.0000000000000274]

50 **Chinese Society of Infectious Diseases,** Chinese Medical Association; Chinese Society of Hepatology, Chinese Medical Association. [The guidelines of prevention and treatment for chronic hepatitis B (2019 version)]. *Zhonghua Gan Zang Bing Za Zhi* 2019; **27**: 938-961 [PMID: 31941257 DOI: 10.3760/cma.j.issn.1007-3418.2019.12.007]

51 **Chinese Society of Hepatology**; Chinese Society of Infectious Diseases, Chinese Medical Association. [Guidelines for the prevention and treatment of hepatitis C (2019 version)]. *Zhonghua Gan Zang Bing Za Zhi* 2019; **27**: 962-979 [PMID: 31941258 DOI: 10.3760/cma.j.issn.1007-3418.2019.12.008]

52 **National Workshop on Fatty Liver and Alcoholic Liver Disease,** Chinese Society of Hepatology, Chinese Medical Association; Fatty Liver Expert Committee, Chinese Medical Doctor Association. [Guidelines of prevention and treatment for alcoholic liver disease: a 2018 update]. *Zhonghua Gan Zang Bing Za Zhi* 2018; **26**: 188-194 [PMID: 29804392 DOI: 10.3760/cma.j.issn.1007-3418.2018.03.007]

53 **National Workshop on Fatty Liver and Alcoholic Liver Disease,** Chinese Society of Hepatology, Chinese Medical Association; Fatty Liver Expert Committee, Chinese Doctor Association. Guidelines of prevention and treatment for nonalcoholic fatty liver disease:a 2018 update. *Shiyong* *ganzangbing zazhi* 2018; **21**: 177-186 [DOI: 10.3969/j.issn.1672-5069.2018.02.007]

54 **Chinese Society of Hepatology,** Chinese Medical Association; Chinese Society of Gastroenterology, Chinese Medical Association; Chinese Society of Infectious Disease, Chinese Medical Associaton. Consensus on the diagnosis and management of autoimmune hepatitis (2015). *Linchuang* *ganzangbing zazhi* 2016; **32**: 9-22 [DOI: 10.3969/j.issn.1001-5256.2016.01.002]

55 **Chinese Society of Hepatology,** Chinese Medical Asociation. Consensus on the diagnosis and management of primary biliary cirrhosis (cholangitis). *Zhonghua Ganzangbing Zazhi* 2016; **24**: 5-13 [DOI: 10.3760/cma.j.issn.1007-3418.2016.01.004]

56 **Chinese Society of Hepatology,** Chinese Medical Association; Chinese Society of Gastroenterology, Chinese Medical Association; Chinese Society of Infectious Disease, Chinese Medical Associaton. Consensus on the diagnosis and management of primary sclerosing cholangitis (2015 version). *Zhonghua Ganzangbing Zazhi* 2016; **26**: 14-22 [DOI: 10.3760/cma.j.issn.1007-3418.2016.01.005]

57 **Kamisawa T**, Nakazawa T, Tazuma S, Zen Y, Tanaka A, Ohara H, Muraki T, Inui K, Inoue D, Nishino T, Naitoh I, Itoi T, Notohara K, Kanno A, Kubota K, Hirano K, Isayama H, Shimizu K, Tsuyuguchi T, Shimosegawa T, Kawa S, Chiba T, Okazaki K, Takikawa H, Kimura W, Unno M, Yoshida M. Clinical practice guidelines for IgG4-related sclerosing cholangitis. *J Hepatobiliary Pancreat Sci* 2019; **26**: 9-42 [PMID: 30575336 DOI: 10.1002/jhbp.596]

58 **European Association for Study of Liver**. EASL Clinical Practice Guidelines: Wilson's disease. *J Hepatol* 2012; **56**: 671-685 [PMID: 22340672 DOI: 10.1016/j.jhep.2011.11.007]

59 **Roberts EA**, Schilsky ML; American Association for Study of Liver Diseases (AASLD). Diagnosis and treatment of Wilson disease: an update. *Hepatology* 2008; **47**: 2089-2111 [PMID: 18506894 DOI: 10.1002/hep.22261]

60 **Powell LW**, Seckington RC, Deugnier Y. Haemochromatosis. *Lancet* 2016; **388**: 706-716 [PMID: 26975792 DOI: 10.1016/S0140-6736(15)01315-X]

61 **The Study of Drug Induced Liver Disease of Chinese**. Diagnosis and treatment guideline on drug-induced liver injury. *Zhonghua ganzangbing zazhi* 2015; **23**: 810-820 [DOI: 10.3760/cma.j.issn.1007-3418.2015.11.004]

62 **Chinese Society of Infectious Disease,** Chinese Medical Association; Expert. Committee for Prevention and Management of Liver Inflammation. Consensus statement by the expert committee for prevention and management of liver inflammation in China. *Zhonghua Ganzangbing Zazhi* 2014; **22**: 94-103 [DOI: 10.3760/cma.j.issn.1007-3418.2014.02.006]

63 **Tian YL,** Zhu XY, Yin WW,Zang ZD, Wang L, Fu XL. Supplemental Fuzhenghuayu capsule therapy for improving liver fibrosis markers in patients with chronic hepatitis B following unsatisfactory outcome of nucleos(t)ide analogue monotherapy. *Zhonghua ganzangbing zazhi* 2013; **21**: 514-518 [DOI: 10.3760/cma.j.issn.1007-3418.2013.07.010]

64 **Jiang YF,** Ma J, He B, Li NP, Tang W, Gong GZ. The therapeutic effect of Anluohuaxian capsule combined with adefovir dipivoxil on patients with chronic hepatitis B and influence on hepatic histology. *Zhonghua Ganzangbing Zazhi* 2012; **20**: 344-347 [DOI: 10.3760/cma.j.issn.1007-3418.2012.05.008]

65 **Yang NH,** Yuan GS, Zhou YC, Liu JW, Huang HP,Hu CG, Xiong L,Li Y, Zhou FY, Yang SL, Zhou YP. Entecavir combined with Fufang Biejia Ruangan tablet in treatment of chronic hepatitis B patients with liver fibrosis:96-week efficacy analyses. *Nanfang yike daxue xuebao* 2016; **26**: 775-779 [DOI: 10.3969/j.issn.1673-4254.2016.06.07]

66 **Xiao DH,** Gu J, Cai H,Zhang Q, Xue DY, Zhao CQ, Xu LM. A randomized placebo-controlled multicentre study of Fuzhenghuayu capsule for prevention of oesophageal variceal bleeding in patients with liver cirrhosis. *Zhonghua Ganzangbing Zazhi* 2014; 22: 594-599 [DOI: 10.3760/cma.j.issn.1007-3418.2014.08.009]

67 **Lizaola B**, Bonder A, Trivedi HD, Tapper EB, Cardenas A. Review article: the diagnostic approach and current management of chylous ascites. *Aliment Pharmacol Ther* 2017; **46**: 816-824 [PMID: 28892178 DOI: 10.1111/apt.14284]

68 **Bhardwaj R**, Vaziri H, Gautam A, Ballesteros E, Karimeddini D, Wu GY. Chylous Ascites: A Review of Pathogenesis, Diagnosis and Treatment. *J Clin Transl Hepatol* 2018; **6**: 105-113 [PMID: 29577037 DOI: 10.14218/JCTH.2017.00035]

69 **Liu KL,** Sun YG, Xia S, Shen WB, Wu J, Lin XC. Analysis of clinical features of 34 cases with liver cirrhosis complicated with chylous ascites. *Zhonghua xiaohua zazhi* 2014; **34**: 96-99 [DOI: 10.3760/cma.j.issn.0254-1432.2014.02.006]

70 **Urrunaga NH**, Singal AG, Cuthbert JA, Rockey DC. Hemorrhagic ascites. Clinical presentation and outcomes in patients with cirrhosis. *J Hepatol* 2013; **58**: 1113-1118 [PMID: 23348236 DOI: 10.1016/j.jhep.2013.01.015]

71 **Pache I**, Bilodeau M. Severe haemorrhage following abdominal paracentesis for ascites in patients with liver disease. *Aliment Pharmacol Ther* 2005; **21**: 525-529 [PMID: 15740535 DOI: 10.1111/j.1365-2036.2005.02387.x]

72 **Lee EW**, Shahrouki P, Alanis L, Ding P, Kee ST. Management Options for Gastric Variceal Hemorrhage. *JAMA Surg* 2019; **154**: 540-548 [PMID: 30942880 DOI: 10.1001/jamasurg.2019.0407]

73 **Hosking SW**, Kennedy HJ, Seddon I, Triger DR. The role of propranolol in congestive gastropathy of portal hypertension. *Hepatology* 1987; **7**: 437-441 [PMID: 3552921 DOI: 10.1002/hep.1840070304]

74 **Pérez-Ayuso RM**, Piqué JM, Bosch J, Panés J, González A, Pérez R, Rigau J, Quintero E, Valderrama R, Viver J. Propranolol in prevention of recurrent bleeding from severe portal hypertensive gastropathy in cirrhosis. *Lancet* 1991; **337**: 1431-1434 [PMID: 1675316 DOI: 10.1016/0140-6736(91)93125-s]

75 **Zhou Y**, Qiao L, Wu J, Hu H, Xu C. Comparison of the efficacy of octreotide, vasopressin, and omeprazole in the control of acute bleeding in patients with portal hypertensive gastropathy: a controlled study. *J Gastroenterol Hepatol* 2002; **17**: 973-979 [PMID: 12167118 DOI: 10.1046/j.1440-1746.2002.02775.x]

76 **Patwardhan VR**, Cardenas A. Review article: the management of portal hypertensive gastropathy and gastric antral vascular ectasia in cirrhosis. *Aliment Pharmacol Ther* 2014; **40**: 354-362 [PMID: 24889902 DOI: 10.1111/apt.12824]

77 **Urrunaga NH**, Rockey DC. Portal hypertensive gastropathy and colopathy. *Clin Liver Dis* 2014; **18**: 389-406 [PMID: 24679502 DOI: 10.1016/j.cld.2014.01.008]

78 **Chinese Society of Infectious Disease,** Chinese Medical Association. Expert consensus on diagnosis and treatment of end-stage liver disease complicated with infections. *Zhonghua Ganzangbing Zazhi* 2018; **26**: 568-578 [DOI: 10.3760/cma.j.issn.1007-3418.2018.08.003]

79 **Rhodes A**, Evans LE, Alhazzani W, Levy MM, Antonelli M, Ferrer R, Kumar A, Sevransky JE, Sprung CL, Nunnally ME, Rochwerg B, Rubenfeld GD, Angus DC, Annane D, Beale RJ, Bellinghan GJ, Bernard GR, Chiche JD, Coopersmith C, De Backer DP, French CJ, Fujishima S, Gerlach H, Hidalgo JL, Hollenberg SM, Jones AE, Karnad DR, Kleinpell RM, Koh Y, Lisboa TC, Machado FR, Marini JJ, Marshall JC, Mazuski JE, McIntyre LA, McLean AS, Mehta S, Moreno RP, Myburgh J, Navalesi P, Nishida O, Osborn TM, Perner A, Plunkett CM, Ranieri M, Schorr CA, Seckel MA, Seymour CW, Shieh L, Shukri KA, Simpson SQ, Singer M, Thompson BT, Townsend SR, Van der Poll T, Vincent JL, Wiersinga WJ, Zimmerman JL, Dellinger RP. Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock: 2016. *Intensive Care Med* 2017; **43**: 304-377 [PMID: 28101605 DOI: 10.1007/s00134-017-4683-6]

80 **Liver Failure and Artificial Liver Group,** Society of Infectious Diseases, Chinese Medical Association; Severe Liver Disease and Artificial Liver Group, Society of Hepatology, Chinese Medical Association.Guideline for diagnosis and treatment of liver failure (2018 edition). *Guoji liuxingbingxue chuanranbingxue zazhi* 2018; **45**: 379-387 [DOI: 10.3760/cma.j.issn.1673-4149.2018.06.002]

81 **Wang H**, Liu A, Bo W, Feng X, Hu Y. Terlipressin in the treatment of hepatorenal syndrome: A systematic review and meta-analysis. *Medicine (Baltimore)* 2018; **97**: e0431 [PMID: 29668606 DOI: 10.1097/MD.0000000000010431]

82 **Zhan GQ,** Li F, Li RG, Guo P, Liu X, Zhang WW, Tan HB. Efficacy of terlipressin therapy for refractory ascites in cirrhosis and type-2 hepatorenal syndrome. *Linchuang gandanbing zazhi* 2015; **31**: 1287-1290 [DOI: 10.3969/j.issn.1001-5256.2015.08.025]

83 **Boyer TD**, Sanyal AJ, Wong F, Frederick RT, Lake JR, O'Leary JG, Ganger D, Jamil K, Pappas SC; REVERSE Study Investigators. Terlipressin Plus Albumin Is More Effective Than Albumin Alone in Improving Renal Function in Patients With Cirrhosis and Hepatorenal Syndrome Type 1. *Gastroenterology* 2016; **150**: 1579-1589.e2 [PMID: 26896734 DOI: 10.1053/j.gastro.2016.02.026]

84 **Israelsen M**, Krag A, Allegretti AS, Jovani M, Goldin AH, Winter RW, Gluud LL. Terlipressin versus other vasoactive drugs for hepatorenal syndrome. *Cochrane Database Syst Rev* 2017; **9**: CD011532 [PMID: 28953318 DOI: 10.1002/14651858.CD011532.pub2]

85 **Cavallin M**, Kamath PS, Merli M, Fasolato S, Toniutto P, Salerno F, Bernardi M, Romanelli RG, Colletta C, Salinas F, Di Giacomo A, Ridola L, Fornasiere E, Caraceni P, Morando F, Piano S, Gatta A, Angeli P; Italian Association for the Study of the Liver Study Group on Hepatorenal Syndrome. Terlipressin plus albumin versus midodrine and octreotide plus albumin in the treatment of hepatorenal syndrome: A randomized trial. *Hepatology* 2015; **62**: 567-574 [PMID: 25644760 DOI: 10.1002/hep.27709]

86 **Tang W,** Jiang MD, Xu H,Qin JP.The study on plasma exchange combined with noradrenalin in the treatment of severe hepatitis with typeⅡ hepatorenal syndrome. *Beijing yixue* 2011; **33**: 713-716 [DOI: 10.15932/j.0253-9713.2011.09.023]

87 **Dong QH,** Guo LM, Liu JY, Jiao YQ,Wang Y, Xiong HF.Albumin dialysis combined with noradrenalin in the treatment of severe hepatitis with type 1 hepatorenal syndrome. *Weichangbingxue he ganbingxue zazhi* 2009; **18**: 852-854 [DOI: 10.3969/j.issn.1006-5709.2009.09.022]

88 **Rössle M**, Gerbes AL. TIPS for the treatment of refractory ascites, hepatorenal syndrome and hepatic hydrothorax: a critical update. *Gut* 2010; **59**: 988-1000 [PMID: 20581246 DOI: 10.1136/gut.2009.193227]

89 **Liu H**, Jayakumar S, Traboulsi M, Lee SS. Cirrhotic cardiomyopathy: Implications for liver transplantation. *Liver Transpl* 2017; **23**: 826-835 [PMID: 28407402 DOI: 10.1002/lt.24768]

90 **Soulaidopoulos S**, Cholongitas E, Giannakoulas G, Vlachou M, Goulis I. Review article: Update on current and emergent data on hepatopulmonary syndrome. *World J Gastroenterol* 2018; **24**: 1285-1298 [PMID: 29599604 DOI: 10.3748/wjg.v24.i12.1285]

91 **Iqbal S**, Smith KA, Khungar V. Hepatopulmonary Syndrome and Portopulmonary Hypertension: Implications for Liver Transplantation. *Clin Chest Med* 2017; **38**: 785-795 [PMID: 29128026 DOI: 10.1016/j.ccm.2017.08.002]

92 **Loffredo L**, Pastori D, Farcomeni A, Violi F. Effects of Anticoagulants in Patients With Cirrhosis and Portal Vein Thrombosis: A Systematic Review and Meta-analysis. *Gastroenterology* 2017; **153**: 480-487.e1 [PMID: 28479379 DOI: 10.1053/j.gastro.2017.04.042]

93 **Priyanka P**, Kupec JT, Krafft M, Shah NA, Reynolds GJ. Newer Oral Anticoagulants in the Treatment of Acute Portal Vein Thrombosis in Patients with and without Cirrhosis. *Int J Hepatol* 2018; **2018**: 8432781 [PMID: 29973997 DOI: 10.1155/2018/8432781]

94 **Xi J,** Liu XY, Chen JY.Research Progress in Anticoagulant Therapy of Liver Cirrhosis Complicated with Portal Vein Thrombosis. *Yixue zongshu* 2019; **25**: 335-340 [DOI: 10.3969/j.issn.1006-2084.2019.02.025]

95 **Bone HG**, Hosking D, Devogelaer JP, Tucci JR, Emkey RD, Tonino RP, Rodriguez-Portales JA, Downs RW, Gupta J, Santora AC, Liberman UA; Alendronate Phase III Osteoporosis Treatment Study Group. Ten years' experience with alendronate for osteoporosis in postmenopausal women. *N Engl J Med* 2004; **350**: 1189-1199 [PMID: 15028823 DOI: 10.1056/NEJMoa030897]

96 **Black DM**, Reid IR, Boonen S, Bucci-Rechtweg C, Cauley JA, Cosman F, Cummings SR, Hue TF, Lippuner K, Lakatos P, Leung PC, Man Z, Martinez RL, Tan M, Ruzycky ME, Su G, Eastell R. The effect of 3 versus 6 years of zoledronic acid treatment of osteoporosis: a randomized extension to the HORIZON-Pivotal Fracture Trial (PFT). *J Bone Miner Res* 2012; **27**: 243-254 [PMID: 22161728 DOI: 10.1002/jbmr.1494]

97 **Zein CO**, Jorgensen RA, Clarke B, Wenger DE, Keach JC, Angulo P, Lindor KD. Alendronate improves bone mineral density in primary biliary cirrhosis: a randomized placebo-controlled trial. *Hepatology* 2005; **42**: 762-771 [PMID: 16175618 DOI: 10.1002/hep.20866]

98 **Guañabens N**, Monegal A, Cerdá D, Muxí Á, Gifre L, Peris P, Parés A. Randomized trial comparing monthly ibandronate and weekly alendronate for osteoporosis in patients with primary biliary cirrhosis. *Hepatology* 2013; **58**: 2070-2078 [PMID: 23686738 DOI: 10.1002/hep.26466]

**Footnotes**

**Conflict-of-interest statement:** All the authors have no conflict of interest related to the manuscript.

**Open-Access:** This article is an open-access article that was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution NonCommercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: http://creativecommons.org/Licenses/by-nc/4.0/

**Manuscript source:** Unsolicited manuscript

**Peer-review started:** April 20, 2020

**First decision:** May 26, 2020

**Article in press:**

**Specialty type:** Gastroenterology and hepatology

**Country/Territory of origin:** China

**Peer-review report’s scientific quality classification**

Grade A (Excellent): A, A

Grade B (Very good): B

Grade C (Good): C

Grade D (Fair): 0

Grade E (Poor): 0

**P-Reviewer:** Manenti A, Sun H **S-Editor:** Liu JH **L-Editor:** Filipodia **P-Editor:**

**Table 1 Child-Pugh score[15]**

|  |  |  |  |
| --- | --- | --- | --- |
| **Clinical biochemical indicators** | **1 point** | **2 points** | **3 points** |
| Hepatic encephalopathy, grade | None | 1-2 | 3-4 |
| Ascites | None | Mild | Moderate to severe |
| Total bilirubin, μmol/L | < 34 | 34-51 | > 51 |
| Albumin, g/L | > 35 | 28-35 | < 28 |
| Prothrombin time prolonged, sec | 1-3 | 4-6 | > 6 |

Child Pugh grading criteria for cirrhosis: Grade A: Child-Pugh score 5-6; Grade B: Child-Pugh score 7-9; Grade C: Child-Pugh score 10-15.

**Table 2 Model for end-stage liver disease score[16]**

|  |  |
| --- | --- |
| **Score, points** | **Significance** |
| < 12 |  |
| 12-18 | Included into the waiting list of liver transplantation |
| 18-25 | Require liver transplantation |
| 25-30 | Require emergent liver transplantation |
| > 30 | Require emergent liver transplantation for rescue |

Model for end-stage liver disease (MELD) score = 3.8 × loge [bilirubin (mg/dL)] + 11.2 × loge (INR) + 9.6 × loge [creatinine (mg/dL) + 6.4 × (causes of disease: Biliary or alcoholic 0, other 1). Bilirubin (mg/dL) = bilirubin (µmol/L) ÷ 17.1; Creatinine (mg/dL) = creatinine (µmol/L) ÷ 88.4.

**Table 3 Laennec F1-F4 staging system, Laennec fibrosis staging scoring system in hepatic puncture tissue[20,21]**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Stage** | **Name** | **Septum, thickness and amount** | **Criteria** | **Score** |
| 0 | No clear fibrosis |  |  | 0 |
| 1 | Very mild fibrosis | +/- | No septum or very few thin septum, portal area enlarged or mild peri-sinusoid fibrosis | 1 |
| 2 | Mild fibrosis | + | Occasionally thin septum, portal area enlarged or mild peri-sinusoid fibrosis | 2 |
| 3 | Moderate fibrosis | ++ | A medium amount of thin septum, even incomplete cirrhosis | 3 |
| 4A | Cirrhosis, mild, definite or possible | +++ | Obvious septum, with circle outline or obvious nodules, thin septum mostly (one wide septum allowable) | 4 |
| 4B | Moderate cirrhosis | ++++ | At least two wide septum, but no very wide septum; less than 1/2 of puncture tissues in length are composed of nodules | 5 |
| 4C | Severe cirrhosis | +++++ | At least one very wide septum, or more than 1/2 of puncture tissues in length are composed of nodules (micronodular cirrhosis) | 6 |