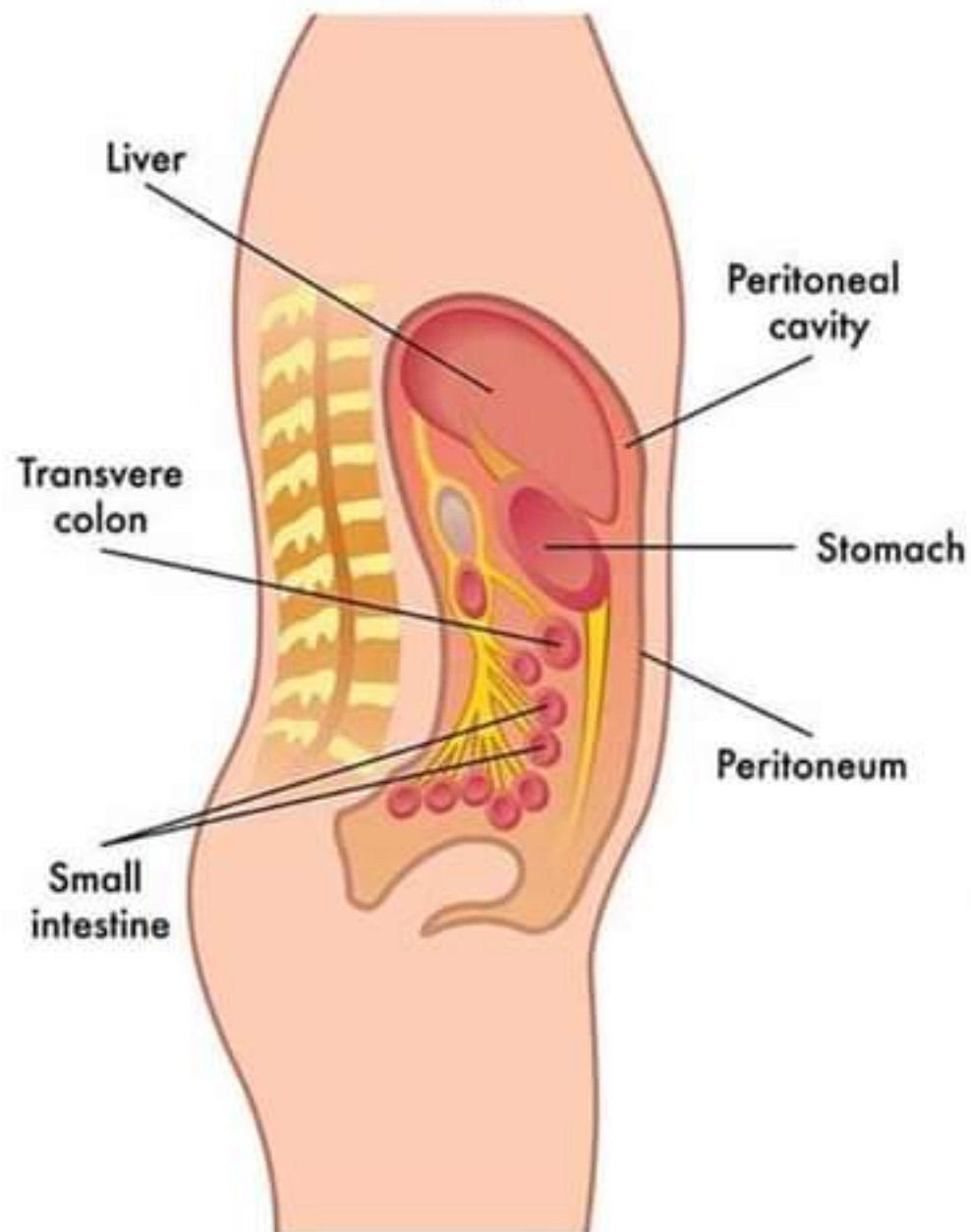


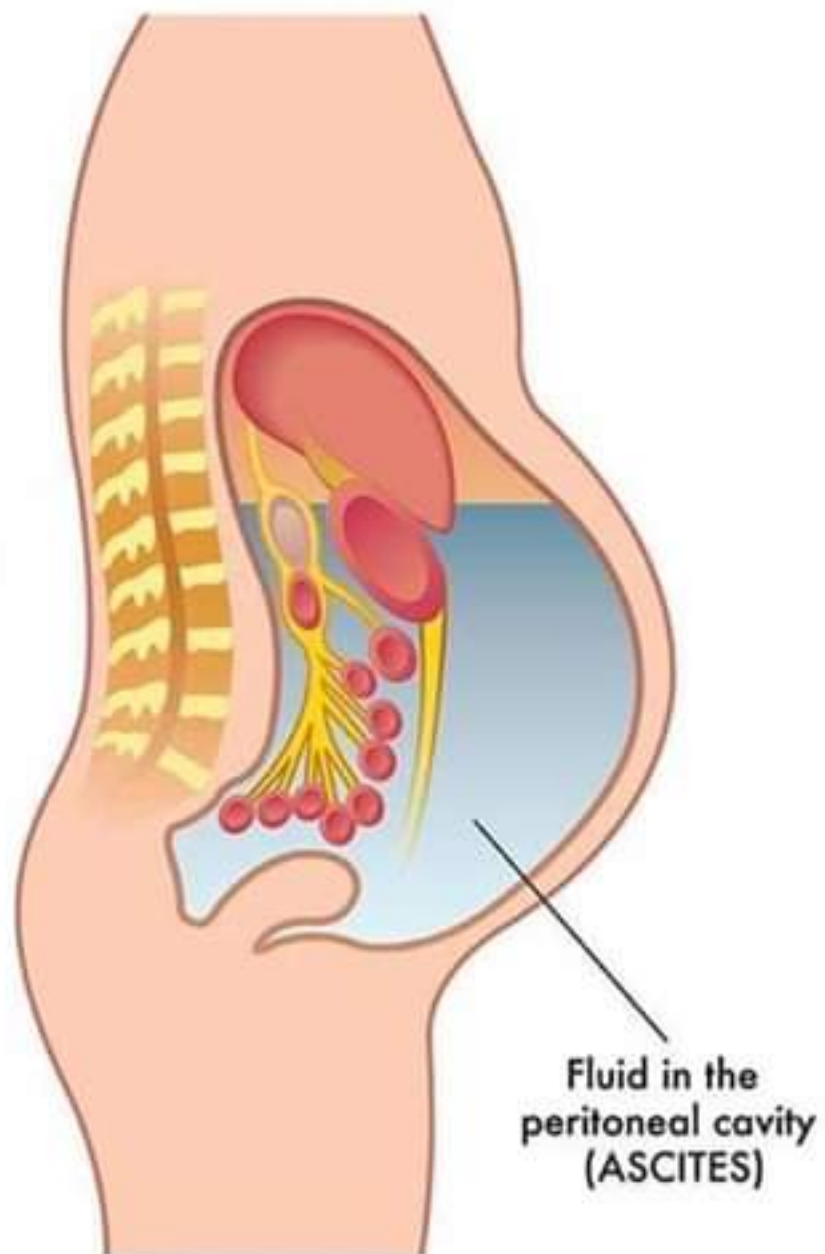
? What is Ascites

- Ascites is the presence of excess fluid in the peritoneal cavity.
- It is a common clinical finding with a wide range of causes, but develops most frequently as a part of the decompensation of previously asymptomatic chronic liver disease.

Healthy



Diseased



What is ascites?

Ascites (A-sigh-teas) is the accumulation of an excessive (larger than normal) amount of fluid in the abdominal cavity.



Alcohol cessation
Avoid NSAIDs
Sodium restriction (2 g/day)

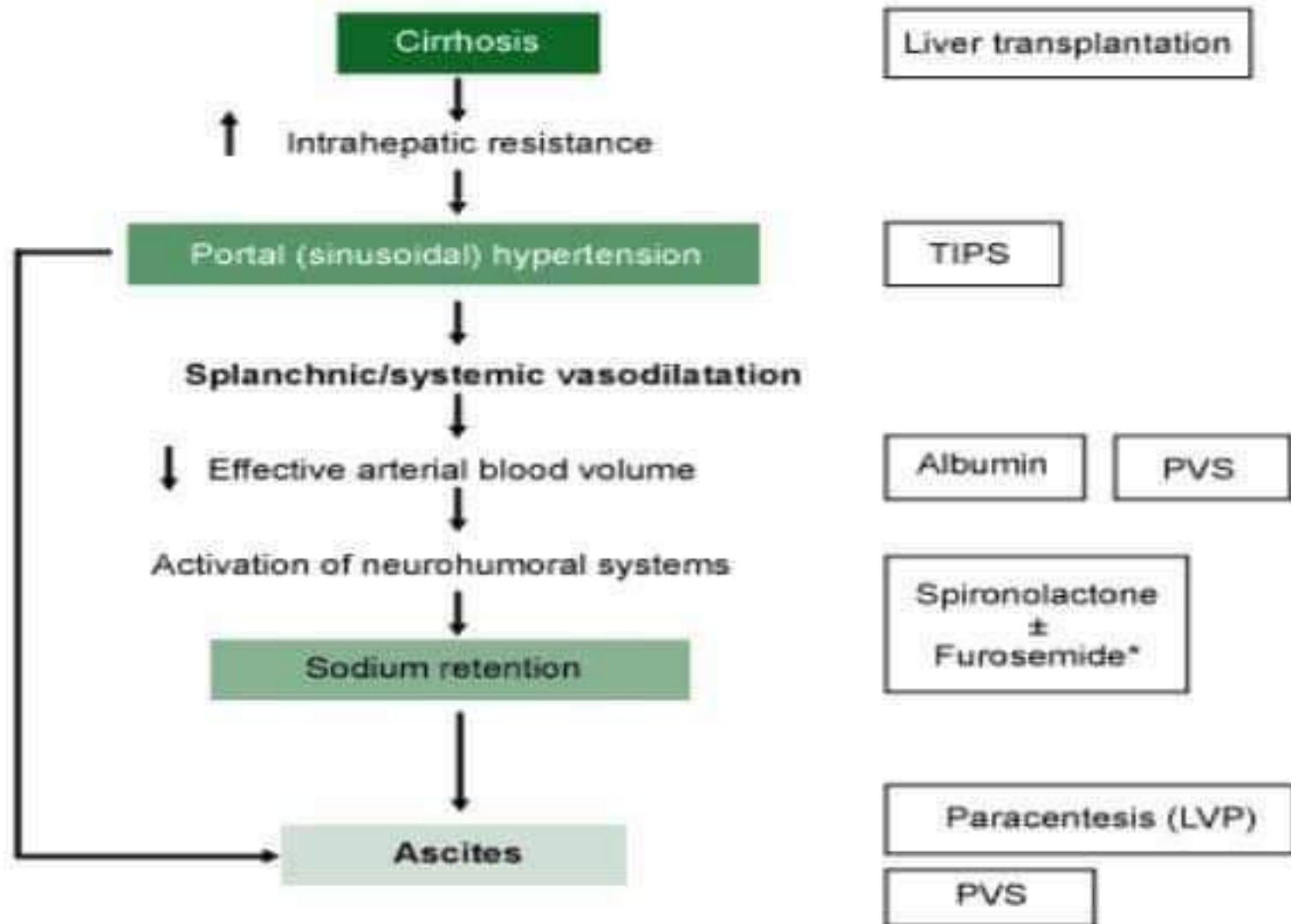
Oral diuretics

- Starting dose: spironolactone 100 mg/furosemide 40 mg PO QD
- Progressive increase every 3 to 5 days
- Maximum dose: spironolactone 400 mg/furosemide 160 mg PO QD

Frequent large volume paracentesis
with albumin infusion

Transjugular intrahepatic
portosystemic shunt (TIPS)

Liver transplantation



LVP, large-volume paracentesis; PVS, peritoneovenous shunt.

**Furosemide should only be used in conjunction with spironolactone.*

Disorder	SAAG		Additional Diagnostic Tests
	≥ 1.1 g/dL	< 1.1 g/dL	
Liver related			
Cirrhosis	X		Ascitic fluid cell count and differential for SBP, total protein
Alcoholic hepatitis	X		
Acute liver failure	X		
Budd-Chiari Syndrome	X		Imaging
Sinusoidal Obstruction Syndrome	X		
Sarcoidosis, hepatic granulomas	X		Liver biopsy
Polycystic liver disease	X		Imaging
Nodular regenerative hyperplasia	X		Liver biopsy
Cardiac			
CHF, constrictive pericarditis, pulmonary hypertension	X		Echocardiogram, right heart catheterization
Neoplasm			
Hepatocellular carcinoma	X		Imaging
Liver metastases	X		Imaging
Peritoneal carcinomatosis		X	Imaging, cytology
Malignant chylous ascites		X	Ascitic fluid triglyceride, imaging
Infection			
Tuberculous peritonitis		X	Mycobacterial culture on directed peritoneal biopsy and ascitic fluid
Secondary bacterial peritonitis		X	Ascitic fluid glucose, LDH, Gram's stain, CEA, alkaline phosphatase
Other			
Nephrotic syndrome		X	24-hour urine protein
Pancreatic ascites		X	Ascitic fluid amylase
Thyroid myxedema	X		Serum thyroid tests
Postoperative lymphatic leak		X	Ascitic fluid triglyceride

Table 2. Differential Diagnosis of Ascites

Cirrhosis

Alcoholic Hepatitis

Heart Failure

Cancer (peritoneal carcinomatosis, massive liver metastases, etc)

"Mixed" Ascites, i. e. Cirrhosis Plus Another Cause for Ascites

Pancreatitis

Nephrotic Syndrome

Tuberculous Peritonitis

Acute Liver Failure

Budd-Chiari Syndrome

Sinusoidal Obstruction Syndrome

Postoperative Lymphatic Leak

Myxedema

High albumin gradient
(SAAG $\geq$ 1.1 mg/dL)

Cirrhosis

Acute alcoholic hepatitis

Heart failure

Hepatic metastases

Nodular regenerative hyperplasia

Budd-Chiari syndrome

Portal vein thrombosis

Idiopathic portal fibrosis

Myxedema

Sinusoidal obstructive syndrome

SAAG: Serum-to-ascitic albumin gradient

Low albumin gradient
(SAAG $<$ 1.1 g/dL)

Peritoneal carcinomatosis

Peritoneal tuberculosis

Pancreatitis

Serositis

Nephrotic syndrome

Bowel obstruction/infarction/
perforation

Pseudomyxoma peritonei

Grade 2 Ascites

↓
Low sodium diet
Diuretics

↓
Spironolactone +/-
Furosemide

↓
Weight loss : 0.5 kg/day

↓
Disappearance of ascites
and edema

MAINTENANCE THERAPY:

Continue low sodium diet
Reduce diuretic therapy as needed

Grade 3 Ascites

↓
Large-Volume
Paracentesis

↓
< 5 liters

> 5 liters

↓
Synthetic plasma
expanders

↓
Albumin

↓
Low sodium diet
Diuretic therapy

Refractory Ascites

Large-Volume Paracentesis plus
Albumin (8 g/L of ascites removed)

*Initial
Management*

Low sodium diet
Fluid restriction in hyponatremic patients

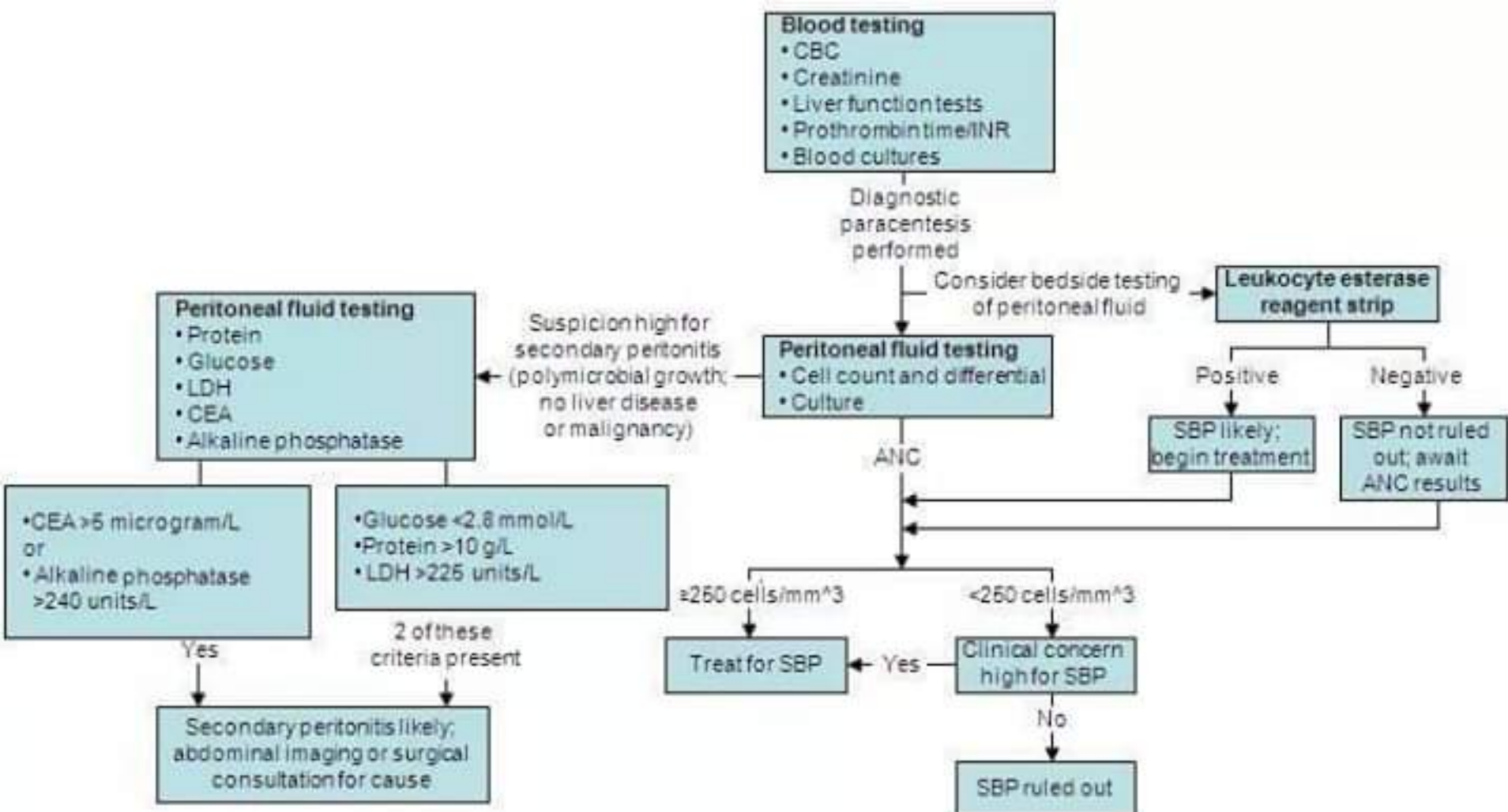
*Maintenance
therapy*

Ongoing Large-Volume Paracentesis
with Albumin as needed

*Very frequent recurrence
Loculated ascites
Patient unwilling*

Continue large-volume
paracentesis

Consider TIPS*



Underfill

Overflow

Vasodilation

Cirrhosis

Portal
hypertension

Primary renal
sodium retention
(? stimulus)

Peripheral arterial
vasodilatation

Ascites

Decreased effective
intravascular
volume

Decreased effective
intravascular
volume

Renal sodium
retention

Increased
blood volume

Renal sodium
retention

Ascites

