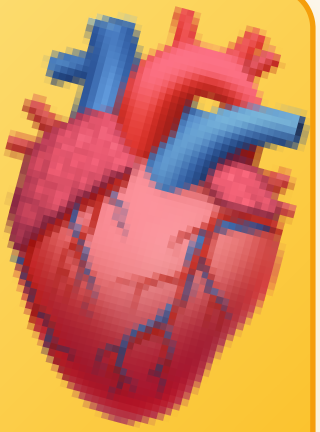
GI / HEPATIC SYSTEM | NGN NCLEX 2026 | HIGH-YIELD TOPIC | CLINICAL JUDGMENT

Liver Cirrhosis

Chronic, progressive, irreversible scarring of the liver with loss of function — including complications (portal hypertension, varices, ascites, encephalopathy) and priority nursing management.



1. Definition / Overview

- ✓ **Cirrhosis** = chronic, progressive, **irreversible** destruction of liver cells replaced by fibrotic scar tissue.
- ✓ Distorted architecture → impaired blood flow → **portal hypertension** and liver failure.
- ✓ The liver loses its ability to metabolize drugs, detoxify ammonia, synthesize albumin and clotting factors, and produce bile.

4 Causes of Cirrhosis

1. **Laënnec's** — Alcoholic — **most common**
2. **Postnecrotic** — Viral hepatitis B & C
3. **Biliary** — Chronic bile duct obstruction
4. **Cardiac** — Chronic right-sided heart failure

2. Pathophysiology (Simplified)

Step 1: Hepatocyte injury (alcohol, virus, toxins, obstruction)

↓

Step 2: Inflammation → necrosis of liver cells

↓

Step 3: Fibrotic scar tissue replaces functional tissue

↓

Step 4: Distorted architecture blocks portal blood flow

↓

Step 5: Portal hypertension → varices, ascites, splenomegaly

Step 6: Liver failure → ↑ ammonia, ↓ albumin, ↓ clotting factors, jaundice → **encephalopathy & death**

3. Signs & Symptoms

EARLY (Compensated)

- Fatigue, weakness, malaise
- Anorexia, nausea, vomiting
- Weight loss
- RUQ pain / tenderness
- Indigestion, flatulence
- Hepatomegaly (early)

LATE (Decompensated)

- ⚠ **Jaundice** — yellow skin & sclera
- ⚠ **Ascites** — abdominal distension
- ⚠ Peripheral edema
- ⚠ Spider angiomas, palmar erythema
- ⚠ Gynecomastia, testicular atrophy (men)
- ⚠ Amenorrhea (women)
- ⚠ Clay-colored stools, dark tea urine
- ⚠ Pruritus (bile salts in skin)
- ⚠ Caput medusae (distended abdominal veins)
- ⚠ **Asterixis** (flapping tremor)
- ⚠ **Fetor hepaticus** (musty breath)
- ⚠ Confusion, altered LOC
- ⚠ Easy bruising, bleeding gums

RED FLAG FINDINGS — Call HCP NOW

Hematemesis (bleeding varices) • **Melena** (black tarry stools) • **Altered mental status / asterixis** (encephalopathy) • **Severe ascites with respiratory distress** • **Hypotension + tachycardia** (hemorrhagic shock)

Major Complications & Management

1. Portal Hypertension

Root cause of many complications

WHAT

↑ Pressure in portal vein due to scarring blocking blood flow into liver.

LEADS TO

Esophageal & gastric varices, ascites, splenomegaly, caput medusae, hemorrhoids.

TREATMENT

Non-selective beta blockers (propranolol), TIPS procedure (transjugular intrahepatic portosystemic shunt).

2. Esophageal Varices

Life-threatening bleed

WHAT

Dilated, thin-walled veins in esophagus that can rupture from Valsalva, straining, coughing, or irritating foods.

PREVENTION TEACHING

Avoid heavy lifting, straining with BM (stool softeners), forceful coughing, rough foods, alcohol, aspirin/NSAIDs.

ACUTE BLEED MANAGEMENT

• Stabilize airway, large-bore IV × 2, fluids/blood

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OCTREOTIDE

(first-line vasoconstrictor) or vasopressin

• Endoscopic band ligation or sclerotherapy

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SENGSTAKEN-BLAKEMORE TUBE

for balloon tamponade (keep scissors at bedside in case of airway compromise!)

• TIPS procedure if refractory

3. Ascites 💧 Fluid in peritoneum

WHAT

Accumulation of fluid in peritoneal cavity from portal HTN + low albumin (decreased oncotic pull).

NURSING ASSESSMENT

Daily weights (same scale, same time, same clothes), measure abdominal girth at umbilicus (mark with pen), I&O, respiratory status.

MANAGEMENT

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LOW SODIUM DIET

(1-2 g/day) + fluid restriction

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SPIRONOLACTONE

(K-sparing) ±

FUROSEMIDE

•
PARACENTESIS
: have client *VOID FIRST* (prevent bladder puncture); monitor for hypovolemia after
• Semi/High-Fowler's position for breathing
• Albumin infusion to pull fluid back into vessels
• Watch for
SBP
(spontaneous bacterial peritonitis) — fever + abdominal pain

4. Hepatic Encephalopathy 🧠 Ammonia toxicity

WHAT
Liver can't convert ammonia (from protein breakdown) into urea → ammonia crosses blood-brain barrier → neuro changes.

SIGNS (STAGES)
Stage 1: subtle personality changes, mild confusion
Stage 2:
ASTERIXIS
(flapping tremor), lethargy, disorientation
Stage 3: marked confusion, stupor
Stage 4: coma

MANAGEMENT
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LACTULOSE
— first-line! Traps ammonia in bowel → excreted in stool. *Goal: 2–3 soft stools/day* (not diarrhea, not constipation).
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RIFAXIMIN
or neomycin — decrease ammonia-producing gut bacteria
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LOW-PROTEIN DIET

during acute episodes (protein = ammonia source)

• Identify & treat precipitants: GI bleed, infection, electrolyte imbalance, constipation, sedatives

5. Coagulopathy & Bleeding

Low clotting factors

WHAT

Liver synthesizes clotting factors + vitamin K activation. Cirrhosis = ↓ factors + ↓ platelets (splenomegaly).

BLEEDING PRECAUTIONS

• Soft toothbrush, electric razor, no flossing

• No IM injections when possible

• Pressure to venipuncture sites for 5+ min

• Avoid NSAIDs, aspirin

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VITAMIN K

administration (SQ/PO/IV)

• FFP or platelets for active bleeding

6. Hepatorenal Syndrome

Poor prognosis

WHAT

Progressive renal failure secondary to advanced liver failure. Oliguria, ↑ BUN/creatinine, Na retention. Often requires liver transplant for survival.

Lab Findings

LAB	CHANGE	WHY
AST / ALT	↑ HIGH	Hepatocyte damage releases enzymes
Alkaline Phosphatase, GGT	↑ HIGH	Biliary obstruction
Bilirubin (direct & total)	↑ HIGH	Impaired bile excretion → jaundice
Ammonia	↑ HIGH	Liver can't convert to urea → encephalopathy
PT / INR	↑ PROLONGED	↓ clotting factor production
Albumin	↓ LOW	Liver synthesizes it → ascites from low oncotic pressure
Platelets	↓ LOW	Splenomegaly traps platelets
Sodium	↓ LOW	Dilutional hyponatremia from fluid retention
Hgb / Hct	↓ LOW	GI bleeding, varices, poor nutrition

4. Priority Nursing Interventions

🔵 Airway / Breathing / Circulation

- ✓ Position **semi-Fowler's or high-Fowler's** (ascites compromises breathing)

🧠 Neuro / LOC

- ✓ Monitor LOC every shift (encephalopathy)
- ✓ Check for **asterixis** (have client extend arms, dorsiflex wrists)

- ✓ Monitor respiratory rate, SpO_2, lung sounds
- ✓ Monitor for GI bleeding: hematemesis, melena, ↓ BP, ↑ HR, ↓ H&H
- ✓ Large-bore IV access for active bleed

- ✓ Serial ammonia levels
- ✓ Fall precautions if confused
- ✓ Assess handwriting as early cue (gets worse with encephalopathy)

🔪 Fluid Balance

- ✓ **Daily weights** — same scale, time, clothing
- ✓ **Abdominal girth** daily (mark skin with pen)
- ✓ Strict I&O
- ✓ Fluid restriction as ordered
- ✓ Report weight gain >2 lb/day or 5 lb/week

🛡️ Safety & Skin

- ✓ Bleeding precautions — soft brush, electric razor, no IM
- ✓ Skin care for pruritus: cool cloths, mild soap, short nails, cholestyramine
- ✓ Turn & reposition (edema → skin breakdown)
- ✓ Avoid **hepatotoxic drugs**: acetaminophen, NSAIDs, alcohol, sedatives, opioids

🍎 Nutrition

- ✓ **Low sodium** (ascites)
- ✓ **High calorie, high carb** (energy)
- ✓ **Moderate protein** usually; **LOW protein only during acute encephalopathy**
- ✓ Small, frequent meals
- ✓ Vitamin supplements: B-complex, thiamine, folate, vitamin K
- ✓ NO ALCOHOL (absolute)

💉 Paracentesis (pre/post)

- ✓ **BEFORE**: client **voids**, vital signs, baseline weight & girth, consent
- ✓ Position: sitting upright, edge of bed or Fowler's
- ✓ **AFTER**: monitor for **hypovolemia** (fluid shifts), VS q15min, check dressing for leak
- ✓ Monitor for bladder puncture, peritonitis, hypotension

5. Pharmacology

DRUG / CLASS	PURPOSE	KEY TEACHING / NURSING CONSIDERATIONS
Lactulose (Cephulac) Osmotic laxative	Hepatic encephalopathy — traps ammonia in bowel	**Goal: 2–3 soft stools/day.** Hold for diarrhea. Monitor LOC & ammonia.
Rifaximin / Neomycin Antibiotic	Decreases ammonia-producing gut bacteria	Used with or instead of lactulose. Neomycin = nephrotoxic, ototoxic.
Spironolactone (Aldactone) K^+-sparing diuretic	Ascites (first-line diuretic)	Watch for **HYPERkalemia**. Give with food. Avoid K-rich foods & salt substitutes.
Furosemide (Lasix) Loop diuretic	Added for ascites if spironolactone alone insufficient	Watch for **HYPOkalemia**, ototoxicity, dehydration.
Propranolol Nonselective β-blocker	↓ Portal HTN → prevents variceal bleed	Monitor HR (hold if <60) & BP.
Octreotide / Vasopressin Vasoconstrictor	Acute variceal bleed	Monitor BP, chest pain (vasopressin → coronary constriction).
Vitamin K (Phytonadione)	Reverses coagulopathy	SQ preferred; monitor PT/INR response.
Albumin 25% Volume expander	Pulls fluid back into vessels; used after large-volume paracentesis	Monitor for fluid overload, BP.
Cholestyramine Bile acid binder	Pruritus from bile salts	Give 1 hr before or 4 hr after other meds.

🚫 Medications & Substances to AVOID

- ✗ **Alcohol** — absolute contraindication
- ✗ **Acetaminophen (Tylenol)** — hepatotoxic; max 2 g/day if any use
- ✗ **NSAIDs, Aspirin** — bleeding risk + nephrotoxicity
- ✗ **Opioids & Sedatives (benzos)** — precipitate encephalopathy; liver can't metabolize
- ✗ **Ammonia-containing products** (some antacids, salt substitutes)

⚠️ 6. NCLEX Test Traps

TRAP 1: Low-protein diet is *not* for all cirrhosis patients — **only during acute encephalopathy**. Chronic protein restriction worsens malnutrition.

TRAP 2: 2–3 soft stools/day on lactulose is the **therapeutic goal**, not a side effect. Don't hold the drug.

TRAP 3: Albumin goes DOWN, PT/INR goes UP. Students flip these often.

TRAP 4: Spironolactone = HYPERkalemia; **Furosemide = HYPOkalemia**. Given together they often balance out.

TRAP 5: Before paracentesis → patient must **VOID** (avoid puncturing bladder). After → watch for **hypovolemia / hypotension** from fluid shifts.

TRAP 6: Dark tea-colored urine + clay-colored stools = bile can't reach intestines (think biliary obstruction from liver disease).

TRAP 7: Hematemesis in a cirrhotic is **ruptured varices until proven otherwise** — medical emergency. Not "just vomiting."

TRAP 8: Never give acetaminophen for RUQ pain in cirrhosis — it's hepatotoxic. Another classic distractor.

TRAP 9: Sengstaken-Blakemore tube? **Keep scissors at bedside** — if balloon migrates and obstructs airway, cut immediately.

TRAP 10: Asterixis is a **neuro sign**, not musculoskeletal — indicates worsening encephalopathy. Report immediately.

7. Patient Education

1. **NO alcohol — ever.** Even one drink accelerates disease.
2. Avoid hepatotoxic drugs: acetaminophen, NSAIDs, herbal supplements (especially kava, comfrey).
3. Low-sodium diet (< 2 g/day); read labels.
4. **Daily weights** at same time — report gain > 2 lb/day or 5 lb/week.
5. Report immediately: **vomiting blood, black tarry stools, confusion, severe SOB, swelling**.
6. Bleeding precautions at home: electric razor, soft toothbrush, no flossing.
7. Prevent constipation (straining ruptures varices) — stool softeners, adequate fluid per HCP.
8. Vaccinations: Hepatitis A & B, pneumococcal, annual flu, COVID.
9. Take lactulose as prescribed — goal is 2–3 soft stools/day, not diarrhea.
10. Skin care for itching: cool baths, mild soap, keep nails short.
11. Small frequent meals; high-calorie, high-carb, moderate protein.
12. Follow-up labs: LFTs, ammonia, PT/INR, albumin.

8. Memory Boosters & Mnemonics

🍋 "L.I.V.E.R." — Classic Signs of Cirrhosis

- **L** — **Lemon yellow** — jaundice (skin & sclera)
- **I** — **Itching** — pruritus from bile salts
- **V** — **Varices** — esophageal/gastric, hemorrhoids, caput medusae
- **E** — **Edema** — ascites + peripheral
- **R** — **Red palms** — palmar erythema, spider angiomas

💨 "A.M.M.O.N.I.A." — Signs of Hepatic Encephalopathy

- **A** — **Asterixis** (flapping tremor)
- **M** — **Mental status** changes (confusion, personality)
- **M** — **Musty breath** — fetor hepaticus
- **O** — **Obtundation** — decreased arousal
- **N** — **Neurological** changes, stupor
- **I** — **Irritability**, handwriting changes
- **A** — **Altered LOC** → coma

4️⃣ "The 4 C's of Cirrhosis"

- **C** **Caput medusae** (distended abdominal veins)
- **C** **Coagulopathy** (bleeding tendency)
- **C** **Clay-colored stools** + dark urine
- **C** **Coma** (encephalopathy)

🧪 "LOW PAWs, HIGH BABs" — Lab Pattern

- ⬇️ **LOW:** Platelets, Albumin, WBCs (sometimes), Sodium
- ⬆️ **HIGH:** Bilirubin, Ammonia, Bleeding times (PT/INR), Liver enzymes (AST/ALT)

💡 Quick Associations

- ✦ **Lactulose = LAX** for **LOC** — a laxative to save the brain
- ✦ **Spironolactone SPARES K^+** — think "K-sparing, Na-losing"
- ✦ **Paracentesis → VOID first** (prevent bladder poke)

- **Varices bleed → OCT**reotide first
- **Ascites diet: "Less salt, less fluid"**

🧭 NCJMM Clinical Judgment Framework

Applying the Next Generation NCLEX 2026 Clinical Judgment Measurement Model to cirrhosis scenarios

🔍 RECOGNIZE Cues

Jaundice, ascites, asterixis, hematemesis, dark urine + clay stools, confusion, ↑ ammonia, ↑ PT/INR, ↓ albumin, spider angiomas.

🧩 ANALYZE Cues

Cluster findings → encephalopathy vs. bleed vs. ascites vs. coagulopathy. Connect ↑ ammonia to LOC changes; connect low albumin to third-spacing.

⚡ PRIORITIZE Actions

ABC first: airway with variceal bleed, breathing with severe ascites. Then stop bleed, lower ammonia (lactulose), diurese ascites, protect from injury, monitor labs.

📊 EVALUATE Outcomes

2–3 soft stools/day (lactulose), improving LOC, weight down (diuretic), decreasing ammonia, INR trending down, stable H&H, girth decreasing.

Part of the NGN NCLEX 2026 Study Series • Liver Cirrhosis (GI / Hepatic) • Review alongside Hepatitis, Pancreatitis, and GI Bleed topics