



A Comprehensive Textbook for Final Year MBBS

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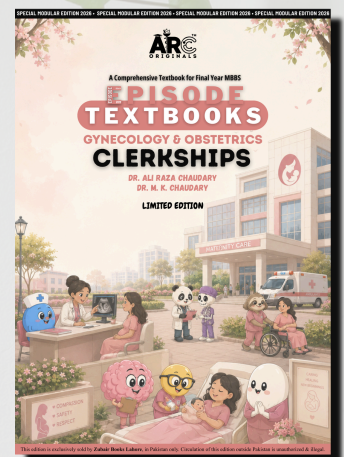
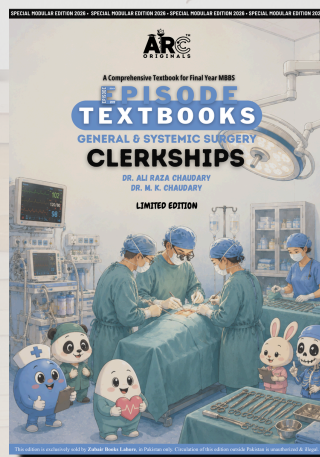
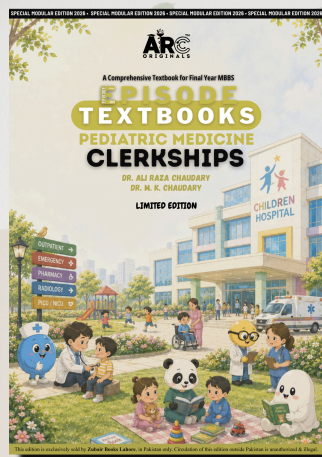
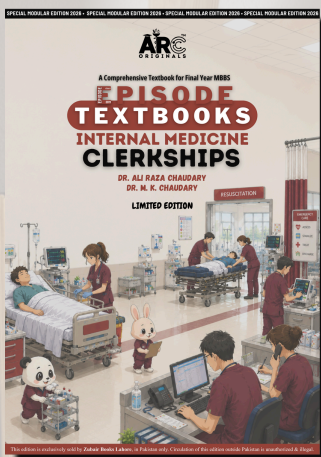
# TEXTBOOKS

## OFFICIAL SAMPLE 26

### CLERKSHIPS

DR. ALI RAZA CHAUDARY  
DR. M. K. CHAUDARY

LIMITED EDITION



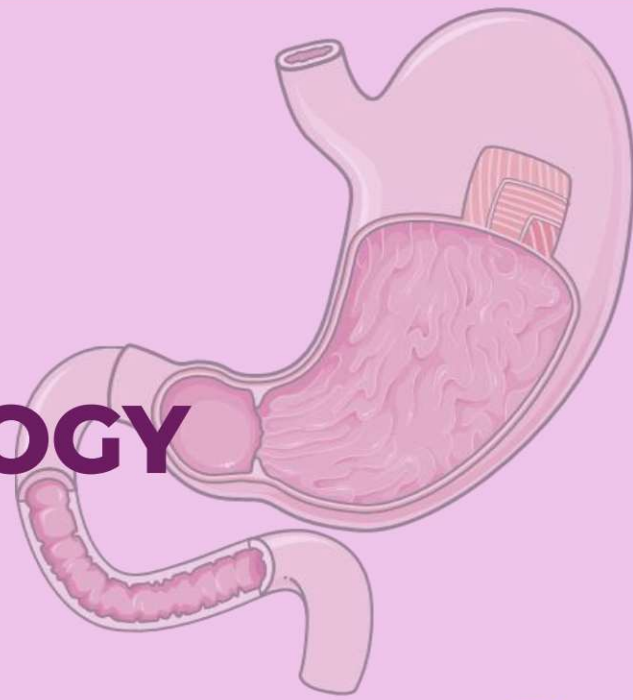
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# H

# GASTROENTEROLOGY

**EPISODE TEXTBOOKS © 2026-27 | MEDICINE-II**

Dr. Ali Raza Chaudary, Dr. M. K. Chaudary



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## TO THE READER,

This book represents the consolidation of 10 years in the medical field helping medical students. You can be fully confident that you have, in one volume, **EVERYTHING** you need to do well in your **professional exams**.

A PROJECT BY

DR. ALI RAZA CHAUDARY





# Peptic Ulcer Disease (PUD) & Dyspepsia

## SPECIFIC LEARNING OUTCOMES 2026

- Describe the etiology of peptic ulcer disease.
- Explain the pathophysiology.
- Identify clinical features and potential complications.
- Outline the management plan.

**Dyspepsia** is defined as upper GIT symptoms including epigastric discomfort, bloating and nausea. Heartburn and acid regurgitation are classified separately as **reflux symptoms**.

- Mucosal defect that remains superficial and do not penetrate through muscularis mucosae: **Erosions**
- Mucosal defect that penetrates through the muscularis mucosae: **Peptic ulcer**
  - Acute ulcers** show no fibrosis
  - Chronic ulcers** penetrate deeply and heal with fibrosis and scarring

## DYSPEPSIA

### CAUSES OF DYSPEPSIA

- DES
- Esophagitis

- Gallstones
- Hepatitis

- Gastritis
- PUD
- IBS
- Gastric cancer
- Pancreatic cancer

### Other causes:

- Functional (non-ulcer) dyspepsia
- Renal failure
- Hypercalcemia
- Drugs (NSAIDs, Steroids, Iron, Digoxin)
- Alcohol
- Anxiety & Depression

Symptoms of Dyspepsia (discomfort, bloating, nausea) → (a) Lifestyle modifications  
(b) Antacids

### Check ALARM features

- Unintentional weight loss
- Anemia
- Persistent vomiting
- Hematemesis +/- melena
- Dysphagia
- Palpable abdominal mass

Present

Urgent Endoscopy

Absent

<55 years

>55 years

H. pylori serum antibody testing

Positive

H. pylori eradication (triple therapy) for 7-14 days

4 week follow-up

Positive

C-13 urea breath test\*\* OR Stool antigen tests

Negative

PPIs or H2RA (for 4 weeks)

If not resolves

If negative

Upper GI Endoscopy

Normal

PPIs

If not resolves

24h pH (GERD?)

Abnormal

Esophagitis

Gastritis

Cancer

Fig. 19.1: Causes & management algorithm of dyspepsia

## Pathogenesis

### ETIOLOGY OF PUD

- Helicobacter pylori** – strongly associated with peptic ulceration
  - 90% of duodenal ulcer
  - 70% of gastric ulcer
- NSAIDs & Aspirin** (10% cases)
- Cigarette smoking**
- Acid hypersecretion** (Zollinger-Ellison)
- Impaired mucosal defense**
- Less Common Causes**
  - Gastrinoma
  - Severe physiological stress
  - Stomal ulceration after gastric surgery
  - IgG4-related disease

## TYPES OF PEPTIC ULCERS

| Feature               | Gastric Ulcer (GU)                    | Duodenal Ulcer (DU)                                    |
|-----------------------|---------------------------------------|--------------------------------------------------------|
| Typical site          | Lesser curvature, often near incisura | First part of duodenum                                 |
| Lifetime risk         | 5%                                    | 15%                                                    |
| Main mechanism        | Impaired mucosal defense              | ↑ Acid exposure with H pylori-related antral gastritis |
| H pylori association  | ~70%                                  | ~90%                                                   |
| Acid secretion        | ↓/N                                   | ↑                                                      |
| Usual age             | Older patients                        | Young patients                                         |
| Malignancy            | Must always be excluded               | Rare                                                   |
| Biopsy                | Mandatory with multiple samples       | Unnecessary                                            |
| Typical complications | Bleeding, Penetration, Malignancy     | Anterior perforation, Posterior bleeding               |
| Follow-up endoscopy   | Mandatory                             | Not routinely required (if uncomplicated)              |

## MODIFIED JOHNSON'S CLASSIFICATION OF GASTRIC ULCERS

| Type | Location                                                | Acid Secretion |
|------|---------------------------------------------------------|----------------|
| I    | Lesser curvature, near incisura angularis (most common) | Low            |
| II   | Body of the stomach and duodenum                        | High           |
| III  | Prepyloric (within 2-3 cm of the pylorus)               | High           |
| IV   | High on the lesser curve, near GE junction              | Low            |
| V    | Anywhere, induced by medication (NSAIDs)                | Low            |

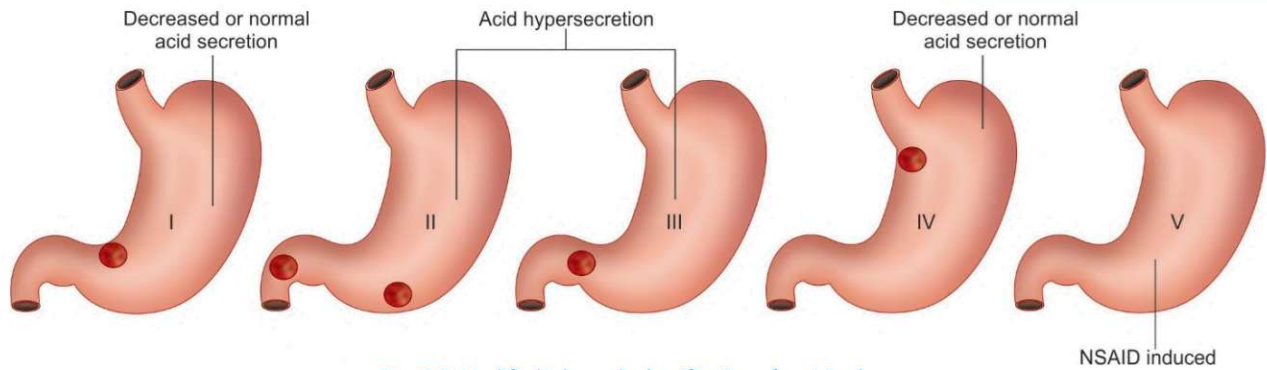


Fig. 19.2: Modified Johnson's classification of gastric ulcers

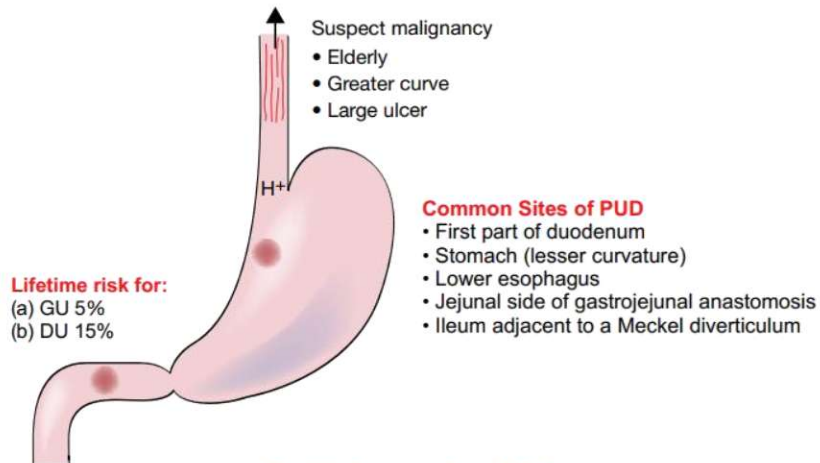
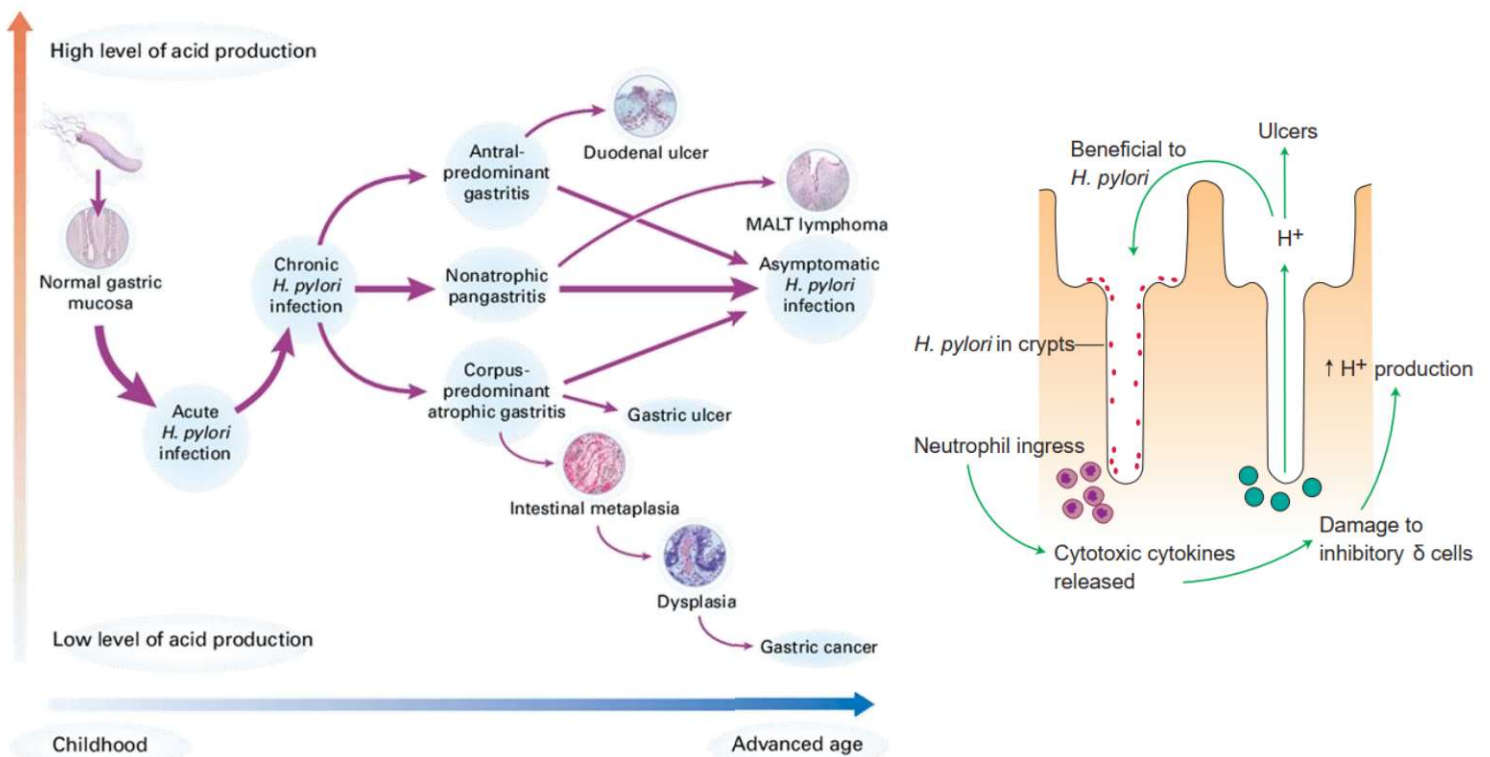


Fig. 19.3: Common sites of PUD


Fig. 19.4: (Left) Natural history of *H. pylori* (Right) Role of *H. pylori* in PUD





M

C

Q

**CAUSES OF REFRACTORY OR NONHEALING PUD**

- Persistent H pylori infection
- Poor adherence or Antibiotic resistance
- Continued NSAID use
- Smoking
- Gastric malignancy or Gastrinoma
- Stomal ulceration
- Rare IgG4-related disease



M

C

Q

All **gastric ulcers must be considered malignant** until adequately excluded.

**FACT CHECK****INDICATIONS FOR H PYLORI TESTING**

- Active or previous PUD
- Dyspepsia
- Gastric MALT lymphoma
- Previous endoscopic resection for gastric cancer
- Long-term NSAID or aspirin
- Unexplained IDA (after exclusion of other sources)
- Unexplained vitamin B12 deficiency
- Immune thrombocytopenia

**Applied****DRUG MANUAL****SIDE EFFECTS OF TRIPLE THERAPY**

- Diarrhea + N&V + Abdominal cramps
- Headache
- Rash
- Flushing & vomiting (alcohol + metronidazole)
- C difficile-associated diarrhea

**AFTER TREATMENT WITH TRIPLE THERAPY**

- Confirm eradication: Breath or Fecal antigen test
- Culture may guide further eradication treatment

**SURGEON LANE****INDICATIONS FOR SURGERY IN PUD****EMERGENCY**

- Perforation
- Uncontrolled or recurrent hemorrhage

**ELECTIVE OR SEMI-ELECTIVE**

- Gastric outlet obstruction
- Persistent ulcer despite adequate medical Mx
- Recurrent ulcer following gastric surgery
- Suspicion of malignancy
- Complex giant ulcer not amenable to endoscopic or medical treatment

**DIAGNOSTIC CLUE (BY EFY) FOR PUD****■ UNCOMPLICATED PUD**

- History of obesity, anti-inflammatory drugs or H. pylori infection
- **Recurrent epigastric pain:**
  - a. **3E's: Episodic, Epigastric, Eating-associated** (↑ in gastric ulcer while ↓ in duodenal ulcer)
  - b. Localized to epigastrium (pointing sign)
  - c. Radiated to back, thorax or other abdominal areas
  - d. 90 minutes to 3 hours post-prandial (± Nocturnal)
- Retrosternal heart burning and acid regurgitation
- Anorexia, nausea and dyspepsia

**■ COMPLICATED PUD**

| Features                                                                                                                                                                                                                                                                                                   | Inference                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Sudden <b>coffee-ground colored</b> vomitus (hematemesis) OR</li> <li>• Black tarry foul-smelling stools (melena) ± Epigastric pain</li> <li>• Hemodynamic instability (Syncope + Tachycardia + Hypotension + Oliguria + Cold clammy skin + Agitation)</li> </ul> | <b>Bleeding peptic ulcer (Upper GI bleeding)</b> |
| <ul style="list-style-type: none"> <li>• <b>Sudden severe generalized abdominal pain</b> (often radiates to shoulder)</li> <li>• Rigid, board-like abdomen + Absent bowel sounds, guarding</li> <li>• Shallow respiration (± shock)</li> <li>• <b>Free air under diaphragm</b> on erect X-ray</li> </ul>   | <b>Perforated peptic ulcer</b>                   |
| <ul style="list-style-type: none"> <li>• <b>Visible gastric peristalsis</b> + Persistent daily vomiting + Dehydration</li> <li>• Succession splash</li> <li>• Hypokalemia, Hypochloridemia</li> <li>• ↑ Bicarbonates and urea</li> <li>• <b>Metabolic alkalosis</b></li> </ul>                             | <b>Gastric outlet obstruction (GOO)</b>          |
| <ul style="list-style-type: none"> <li>• Microcytic anemia</li> </ul>                                                                                                                                                                                                                                      | <b>Chronic occult bleeding</b>                   |

**INVESTIGATIONS FOR PUD**

- **Upper gastrointestinal endoscopy** – preferred investigation
- **Biopsy** (to rule out **gastric malignancy** and **H. pylori infection**) + Follow-up endoscopy
- **Specific tests for H. pylori infection**

| Non-Invasive Tests                                                                                                                                                                                | Invasive Tests                                                                                                                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Serology (IgG)</li> <li>• <b>C-13 urea breath test</b> – preferred confirmatory</li> <li>• <b>Fecal antigen test</b> – preferred confirmatory</li> </ul> | <ul style="list-style-type: none"> <li>• Microscopic examination (Histology)</li> <li>• <b>Rapid urease test</b> (85% sensitive)</li> <li>• <b>Culture</b> – gold standard (100% sensitive)</li> <li>• PCR assay</li> </ul> |

- **Radiographic barium study**

**MANAGEMENT OF UNCOMPLICATED PUD**

- **General measures**
  - a. Avoid alcohol, aspirin, NSAIDs and smoking
  - b. No special dietary advice (but avoid too much junk food)
- **Acid-neutralizing drugs**
  - a. Antacids e.g. Mg(OH)<sub>2</sub>, Al(OH)<sub>3</sub>
  - b. **Proton pump inhibitors (PPIs)** e.g. omeprazole, rabeprazole – main DOC
  - c. H<sub>2</sub>-receptor antagonists (H<sub>2</sub>RA) e.g. famotidine, ranitidine
  - d. Cytoprotective agents e.g. sucralfate, colloidal bismuth, misoprostol
- **H-pylori eradication regimens**
  - a. Standard triple therapy: Any one of following combinations BD (each drug) for 10-14 days
    - PPI 20 mg + Clarithromycin 500 mg + Amoxicillin 1000 mg
    - PPI 20 mg + Clarithromycin 500 mg + Metronidazole 500 mg
    - PPI 20 mg + Metronidazole 500 mg + Amoxicillin 1000 mg
  - b. Quadruple therapy: Bismuth + Metronidazole + Tetracycline + PPI (for 10-14 days)
- **NSAIDs-induced ulcer**
  - a. Stop NSAID & test for H. pylori
  - b. PPI + COX2 selective NSAIDs (celecoxib)
- **Refractory or nonhealing ulcer**
  - a. Repeat endoscopy or biopsy or H. pylori testing
  - b. Review all medications
  - c. Measure fasting serum gastrin in H pylori-negative, non-NSAID ulceration

**COMPLICATIONS OF PUD**

- **Bleeding** – most common overall
- **Perforation** – most common in gastric ulcers
- Gastric outlet obstruction (GOO or stenosis)

- Recurrent ulceration
- Malignancy (gastric)
- Penetration into surrounding structures
  - a. Posterior gastric ulcer → Pancreas, Splenic artery or Transverse colon
  - b. Posterior duodenal ulcer → Gastroduodenal artery

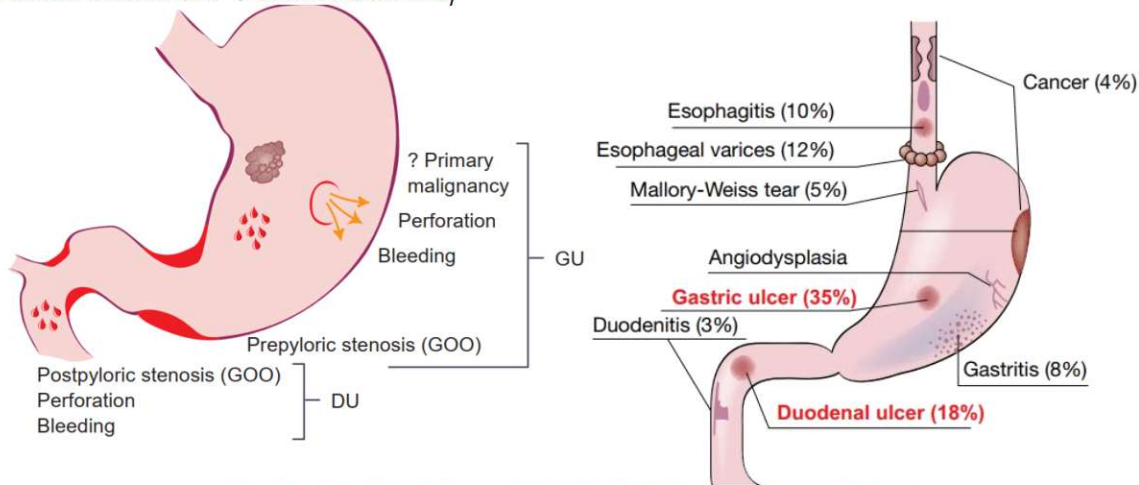


Fig. 19.5: (Left) Complications of PUD (Right) Main causes of upper GI bleed

## ACUTE UPPER GI BLEEDING

### CAUSES

See Fig. 19.5 (right)

### MANAGEMENT

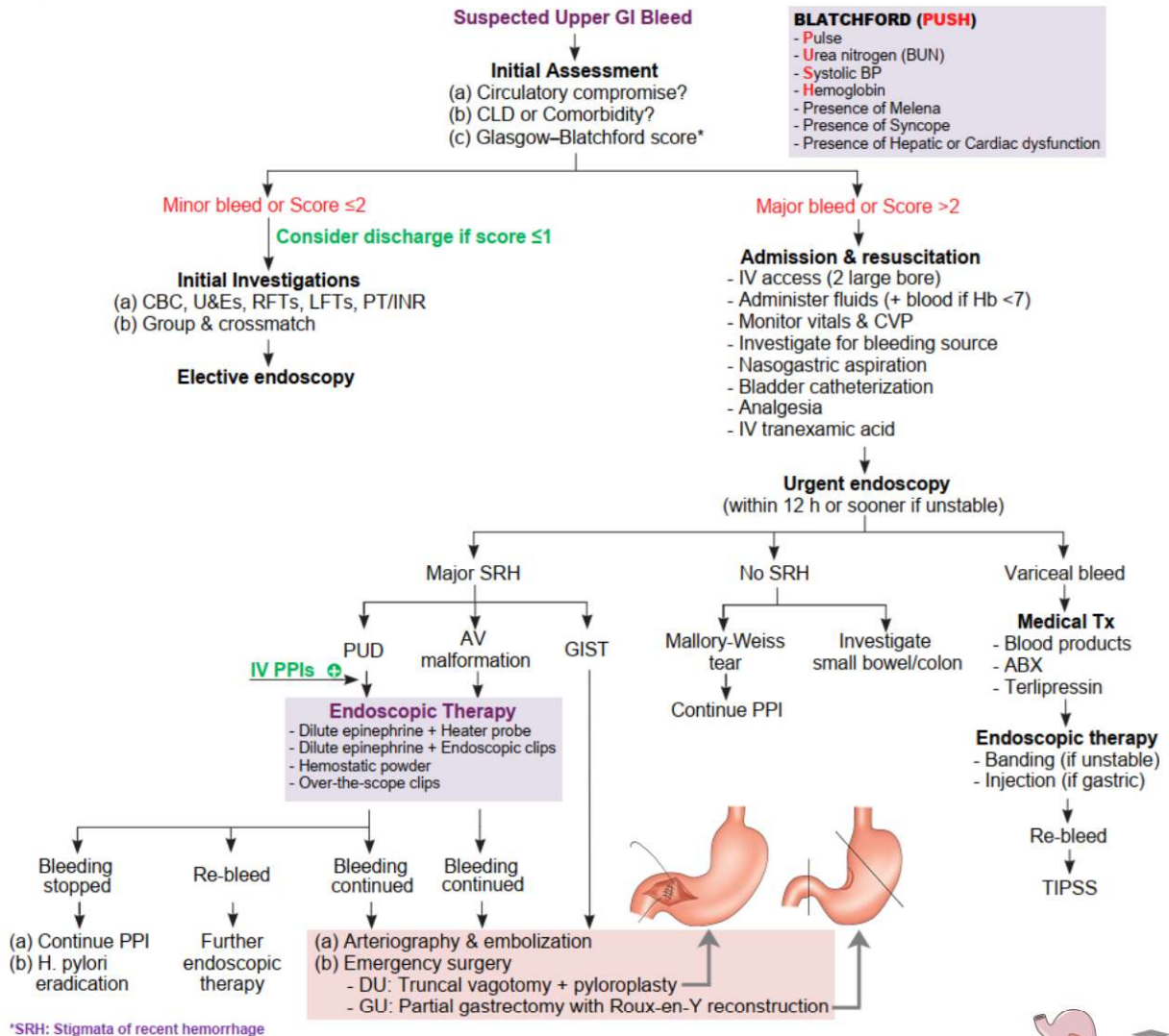


Fig. 19.6: Management algorithm of upper GI bleed



# Pathogenesis

## PATHOGENESIS OF PERFORATED PUD

Ulcer penetrates the full (duodenal > gastric) wall →  
Duodenal or gastric contents enter the peritoneum →  
Chemical peritonitis → Secondary bacterial peritonitis  
→ Sepsis and shock

## KEY FACTS

### CONSERVATIVE MX IN PERFORATED PUD

Only if

- Small sealed leak
- Mild contamination
- Stable clinical condition

## PERFORATED PEPTIC ULCER

### INVESTIGATIONS

- **Erect plain CXR** (gas under diaphragm) – initial IOC
- **CT scan** (more sensitive) – diagnostic IOC
- **Serum amylase** (to rule out acute pancreatitis)
- **Water-soluble contrast study** (demonstrate leakage if required)

### MANAGEMENT

- **Admission & resuscitation**
  - a. IV fluids
  - b. Analgesia
  - c. Nasogastric decompression
  - d. Broad-spectrum ABX + PPI
- **Surgical therapy:** Laparotomy followed by peritoneal lavage
  - a. Simple perforation:
    - DU: Transverse primary closure ± Omental patch OR Omental patch alone
    - GU: Excise and closure (to exclude malignancy)
  - b. Massive perforation: Distal gastrectomy with Roux-en-Y reconstruction
- **Post-op therapy**
  - a. Nasogastric decompression
  - b. Acid suppression ± H pylori eradication
  - c. Avoid NSAIDs (life-long PPIs may be appropriate if NSAIDs must continue)

## GASTRIC OUTLET OBSTRUCTION (GOO)

### CAUSES

- Pyloric or duodenal ulcer edema (reversible inflammatory narrowing)
- Fibrotic pyloric stenosis (chronic ulcer scarring)
- Carcinoma of gastric antrum (malignant obstruction)
- Adult hypertrophic pyloric stenosis (muscular narrowing)
- Infantile (congenital) pyloric stenosis

### INVESTIGATIONS

- **Blood tests**
  - a. U&Es: Hypokalemia, Hypochloremia, Hypovolemia
  - b. ABGs: Metabolic alkalosis
  - c. RFTs
- **Saline load scintigraphy** – diagnostic test
- **Endoscopy** (after gastric decompression)
- **Biopsy** (to exclude malignancy)
- **Imaging** (where required to assess cause)

### MANAGEMENT

- **Initial therapy**
  - a. Wide-bore nasogastric decompression
  - b. IV isotonic saline + K<sup>+</sup> replacement (4 L saline + 80 mmol K<sup>+</sup> in 24 h in severe cases)
  - c. High-dose PPI
- **Definitive therapy**
  - a. Endoscopic balloon dilation (if benign fibrotic stenosis)
  - b. Surgery (if dilation fails or recurrence occurs)
    - **Vagotomy + Antrectomy** – surgery of choice
    - Vagotomy + Gastrojejunostomy

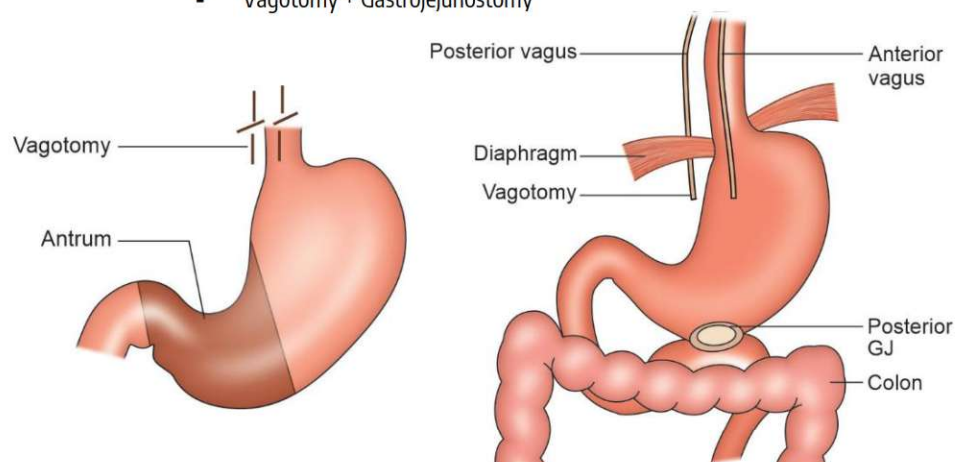


Fig. 19.7: (Left) Vagotomy + Antrectomy (Right) Vagotomy + Gastrojejunostomy

## COMPLICATIONS OF SURGICAL PROCEDURES FOR PUD

### ■ COMPLICATION FOLLOWING GASTRECTOMY OR VAGOTOMY

| Complications                                 | Causes & Sx                                                                                                                                                                                                                | Mx                                                                                                                                                                      |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Dumping syndrome</b>                       | See below                                                                                                                                                                                                                  |                                                                                                                                                                         |
| <b>Duodenogastric bile reflux gastropathy</b> | <ul style="list-style-type: none"> <li>Epigastric pain</li> <li>Reflux Sx</li> <li>Bilious vomiting</li> </ul>                                                                                                             | Ursodeoxycholic acid ± Roux-en-Y diversion                                                                                                                              |
| <b>Postvagotomy diarrhea</b>                  | <ul style="list-style-type: none"> <li>Rapid gastric emptying (1-2 h after eating)</li> <li>Upper GI denervation</li> <li>Abnormal GI peptide response</li> <li>Bacterial overgrowth</li> </ul>                            | <ul style="list-style-type: none"> <li>Small dry meals</li> <li>↓ Refined carbohydrates</li> <li>Loperamide or Codeine phosphate</li> <li>Revisional surgery</li> </ul> |
| <b>Weight loss (30-40%)</b>                   | <ul style="list-style-type: none"> <li>Small gastric remnant</li> <li>↓ Intake</li> <li>Diarrhea &amp; Steatorrhea</li> </ul>                                                                                              | Nutritional advice                                                                                                                                                      |
| <b>Anemia</b>                                 | <ul style="list-style-type: none"> <li>IDA</li> <li>B12 or folate deficiency</li> </ul>                                                                                                                                    | Treat cause ± Supplements                                                                                                                                               |
| <b>Metabolic bone disease</b>                 | <ul style="list-style-type: none"> <li>Osteoporosis</li> <li>Osteomalacia</li> </ul>                                                                                                                                       | Dietary advice<br>± Vitamin D or calcium supplements                                                                                                                    |
| <b>Gastric remnant cancer</b>                 | <ul style="list-style-type: none"> <li>Bile reflux gastritis</li> <li>Intestinal metaplasia</li> <li>Hypochlorhydria</li> <li>Smoking</li> <li>H pylori</li> </ul>                                                         | Routine surveillance after previous ulcer surgery                                                                                                                       |
| <b>Gallstones</b>                             | <ul style="list-style-type: none"> <li>Biliary denervation</li> <li>cholestasis</li> </ul>                                                                                                                                 | Cholecystectomy                                                                                                                                                         |
| <b>Gastrojejunal-colic fistula</b>            | <ul style="list-style-type: none"> <li>Stomal ulcer penetrates transverse colon</li> <li>Severe postprandial diarrhea</li> <li>Feculent breath + Feculent vomiting</li> <li>Rapid weight loss &amp; dehydration</li> </ul> | <ul style="list-style-type: none"> <li>CT with oral contrast or barium enema</li> <li>Treat dehydration and malnutrition</li> <li>Revisional surgery</li> </ul>         |

### ■ DUMPING SYNDROME

| Features         | Early Dumping Syndrome                                                                                                                                                                                                                                                                                                                                                   | Late Dumping Syndrome                                                                                                                                                                                                                                                                                                      |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mechanism</b> | Rapid delivery of hyperosmolar food into small intestine → Fluid shifts from circulation into bowel lumen → Intestinal distention and reduced circulating volume → GIT and vasomotor Sx                                                                                                                                                                                  | Rapid carbohydrate absorption → Hyperglycemia → Exaggerated insulin release → Reactive hypoglycemia                                                                                                                                                                                                                        |
| <b>Timing</b>    | Within <b>30 minutes</b> after a meal                                                                                                                                                                                                                                                                                                                                    | <b>1-3 hours</b> after meals                                                                                                                                                                                                                                                                                               |
| <b>Sx</b>        | <ul style="list-style-type: none"> <li>Epigastric fullness + Colicky pain</li> <li>Diarrhea &amp; Flushing</li> <li>Palpitations &amp; Sweating</li> <li>Tachycardia &amp; Hypotension</li> <li>Lightheadedness</li> </ul>                                                                                                                                               | <ul style="list-style-type: none"> <li>Tremors &amp; Sweating</li> <li>Nausea</li> <li>Weakness</li> <li>Faintness</li> <li><b>Symptoms relieved by food</b></li> </ul>                                                                                                                                                    |
| <b>Mx</b>        | <ul style="list-style-type: none"> <li>Small frequent meals               <ul style="list-style-type: none"> <li>Increase protein and fat</li> <li>Reduce refined carbohydrates</li> <li>Avoid wet, high-carbohydrate meals</li> </ul> </li> <li>Lie down after eating</li> <li>Octreotide (in resistant cases)</li> <li>Revisional surgery (rarely required)</li> </ul> | <ul style="list-style-type: none"> <li>Small frequent meals               <ul style="list-style-type: none"> <li>Increase protein and fat</li> <li>Reduce refined carbohydrates</li> <li>Avoid wet, high-carbohydrate meals</li> </ul> </li> <li>Lie down after eating</li> <li>Octreotide (in resistant cases)</li> </ul> |

## ZOLLINGER-ELLISON SYNDROME

Severe acid hypersecretion caused by a gastrin-secreting neuroendocrine tumor

### ■ DIAGNOSTIC CLUE (BY EFY)

- Severe recurrent multiple ulcers at unusual sites** (Post-bulbar duodenum, Jejunum, Esophagus)
- Poor response to standard therapy
- Bleeding or Perforation
- Diarrhea + Steatorrhea

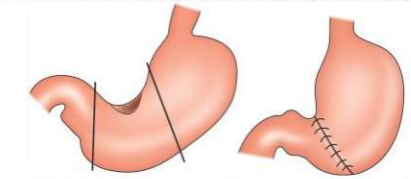
### ■ INVESTIGATIONS

- Fasting serum gastrin:** Markedly ↑↑ (10-1000x normal)
- Secretin stimulation** (paradoxical marked rise in gastrin)
- Imaging**
  - CT scan
  - Endoscopic ultrasound
  - Somatostatin receptor imaging
  - Gallium-68 DOTATATE PET



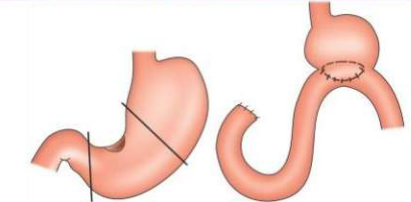
### HISTORICAL ULCER OPERATIONS

#### BILLROTH I GASTRECTOMY (for gastric ulcer)



- Distal stomach removed
- Gastric remnant anastomosed to duodenum

#### BILLROTH II / POLYA GASTRECTOMY



- Distal stomach removed
- Duodenal stump closed
- Stomach anastomosed to jejunum
- Diverts gastric contents away from duodenum

#### GASTROJEJUNOSTOMY (for malignancy)

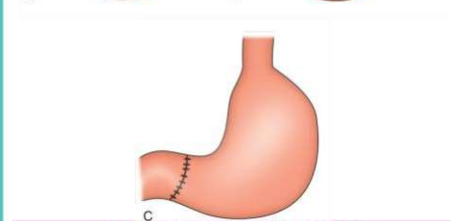
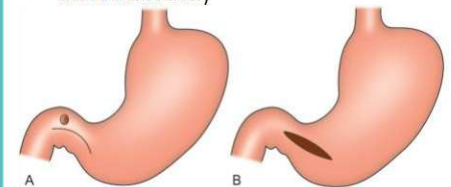
- Bypasses pylorus or duodenum

#### TRUNCAL VAGOTOMY

- Divides anterior and posterior vagal trunks
- Requires drainage procedure (**Heineke-Mikulicz Pyloroplasty**) as gastric emptying is impaired

#### HEINEKE-MIKULICZ PYLOROPLASTY

- Longitudinal incision across pylorus
- Incision deepened
- Closed transversely



#### HIGHLY SELECTIVE VAGOTOMY

- Denervates parietal-cell-bearing stomach
- Preserves antral and pyloric innervation
- Produces fewer drainage-related complications





# Pathogenesis

## ZOLLINGER ELLISON SYNDROME

### PATHOGENESIS

Gastrinoma → Marked hypergastrinemia → ↑Parietal-cell mass 3–6x → ↑↑↑Gastric acid secretion → Small bowel pH falls to  $\leq 2$  → Pancreatic lipase is inactivated → Bile acids precipitate → Diarrhea and steatorrhea

### TUMOR FEATURES

- Approximately 90% occur in pancreatic head or proximal duodenum
- 20–60% are associated with MEN1
- Sporadic tumors are usually **solitary**
- MEN1 tumors are usually **multifocal**
- Approximately  $\frac{1}{2}$  to  $\frac{2}{3}$  are malignant
- Often slow-growing
- Five-year survival approximately **60–75%**

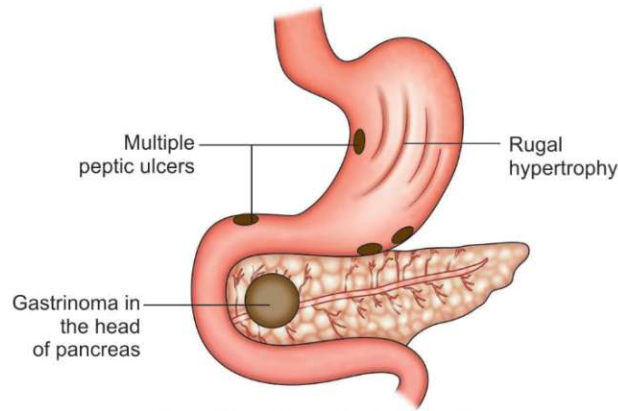


Fig. 19.8: Zollinger Ellison syndrome

### MANAGEMENT

- **High-dose continuous PPI**
- **Somatostatin analog** i.e. octreotide
- **Surgery**
  - a. Resect localized solitary tumor (if possible)
  - b. Multifocal or metastatic disease may not be suitable for curative surgery
- **Genetic screening** for MEN1

### UHS 5-OPTIONED MULTIPLE CHOICE QUESTIONS

**UHS-M07:** A previously fit and well 14 weeks primigravida in one of her bouts of severe vomiting and retching vomits out about 30 cc of bright red blood. She is most likely to have developed:

- a) Bleeding disorder
- b) Mallory Weiss tear
- c) Carcinoma stomach
- d) Gastric ulcer
- e) Duodenal ulcer

**EFY KEY 2026:** b) Mallory Weiss tear. Vomiting bright red blood in a pregnant woman is most likely to be due to a Mallory Weiss tear, a laceration of the mucosa at the junction of the esophagus and stomach caused by severe retching or vomiting. Other causes of upper gastrointestinal bleeding in pregnancy include peptic ulcer disease, esophageal varices, and gastritis.

**UHS-A12:** A 50-year-old man presents to the emergency with hematemesis; he is taking oral corticosteroids for his arthritis. The following is not indicated in this emergency:

- a) Clotting profile
- b) Upper GI endoscopy
- c) Sucralfate
- d) Barium swallow
- e) IV proton pump inhibitors

**EFY KEY 2026:** d) Barium swallow. It is not indicated in the emergency management of a patient with hematemesis. It is a radiological test that involves swallowing a contrast material, which can lead to bowel obstruction or aspiration in a patient with active hematemesis.

**UHS-A13:** A 36-year-old man has a history of periodic upper abdominal pain and occasional blood in vomiting. On endoscopy he was found to have a gastric ulcer which on histology showed *H. pylori*. Which of the following treatment regimens you would prescribe?

- a) Metronidazole + clarithromycin + omeprazole
- b) Metronidazole
- c) Clarithromycin
- d) Metronidazole plus clarithromycin
- e) Omeprazole

**EFY KEY 2026:** a) Metronidazole plus clarithromycin plus omeprazole. This triple therapy is a recommended first-line treatment for *H. pylori*-associated gastric ulcers. Metronidazole and clarithromycin are used to eradicate the infection, while omeprazole reduces gastric acid secretion and promotes healing of the ulcer.

**UHS-S13:** A 40-year-old alcoholic is admitted in the emergency with severe retching followed by a small amount of blood in his vomit. Most likely diagnosis in this patient would be:

- a) Acute hepatitis
- b) Mallory Weiss syndrome
- c) Peptic ulcer
- d) Cirrhosis of liver
- e) Reflux esophagitis

**EFY KEY 2026:** b) Mallory Weiss syndrome. It is a condition characterized by mucosal tears at the gastroesophageal junction, usually caused by severe vomiting or retching. Patients with Mallory Weiss syndrome may present with hematemesis, abdominal pain, and vomiting.



**UHS-A17:** A 50-year-old woman is referred by GP for upper GI endoscopy following a 4-month history of epigastric pain despite treatment with antacids and proton pump inhibitors. Her endoscopy demonstrated a duodenal ulcer coupled with a positive helicobacter like organism. She was given a 2 week course of drugs to eradicate the helicobacter pylori. How will you assess eradication of H. pylori by non-invasive method?

- a) Anti helicobacter antibody test
- b) Fecal antigen test
- c) Histology of gastric mucosa
- d) Rapid urease test
- e) Microbiological culture of gastric aspirate

**EFY KEY 2026:** b) Fecal antigen test. The fecal antigen test is a non-invasive and reliable method for assessing the eradication of H. pylori after treatment. It detects the presence of H. pylori antigens in the stool, indicating whether the bacteria have been successfully eliminated.

**UHS-A17:** A middle-aged person is admitted with nausea, vomiting and upper abdominal distension for last 6 months. His vomiting is of large quantities and contains food particles ingested 24 hours ago. He is having metabolic alkalosis with acidic urine. What is most likely diagnosis?

- a) Acute gastritis
- b) Acid peptic disease
- c) Gastric outlet obstruction
- d) Raised intracranial pressure
- e) Addison's disease

**EFY KEY 2026:** c) Gastric outlet obstruction. The patient's symptoms are suggestive of gastric outlet obstruction, which can occur due to a variety of causes, such as peptic ulcer disease or malignancy. The metabolic alkalosis and acidic urine may be due to vomiting of gastric contents, leading to loss of hydrochloric acid and potassium.

### UHS OPTIONLESS MULTIPLE CHOICE QUESTIONS

**UHS-A16:** Peptic ulcer strongly associated with H. pylori infection: Duodenal ulcer > Gastric ulcer

**UHS-S17:** Treatment in case of postprandial burning pain and gas bloating: Proton pump inhibitors (PPIs)

**UHS-S17:** Common peptic ulcer associated with H. pylori: Duodenal ulcer

**UHS-A19:** Drugs for H. pylori: Amoxicillin, Metronidazole, Omeprazole, Clarithromycin

**UHS-A20:** Recurrent gastric ulcers + No NSAIDs history + H. pylori ∅: Rule out gastrin levels

**UHS-A20:** Diagnostic finding in case of vomiting with food i.e. gastric outlet obstruction: Succussion splash

**UHS-A22:** It's not a feature of H. pylori infection: Culture on gastric aspirate

**UHS-A22:** Not given in hematemesis in emergency: Barium swallow

**UHS-A23:** Hormone that inhibits HCl: Somatostatin

**UHS-A24:** Positive H. pylori test requires treatment with: H. pylori eradication therapy

**UHS-A24:** History of asthma and esophagitis requires management with: Proton pump inhibitors (PPI)

**UHS-A24:** Gastric MALT lymphoma confined to mucosa requires treatment with: H. pylori eradication therapy

**UHS-A25:** Initial Ix for epigastric pain with suspected H. pylori infection: Stool H. pylori test

**UHS-A25:** Drug safe to continue after endoscopic evaluation in upper GI bleeding: Aspirin

**UHS-A25:** Acid-base disturbance in persistent vomiting with loss of gastric acid: Metabolic alkalosis

**UHS-A25:** Immediate Mx of hematemesis with hypotension and shock: IV fluids (colloid/crystalloid)

**UHS-A25:** Mx of gastric outlet obstruction due to diabetic autonomic neuropathy with vomiting: Domperidone (Dx: Diabetic gastroparesis)

### EFY CLINICAL CLINCHERS

|                                                                                   |                                                               |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------|
| Recurrent epigastric pain related to meals with symptom-free intervals            | Peptic ulcer disease                                          |
| Older NSAID user presents with bleeding without preceding ulcer pain              | Silent NSAID-associated ulcer                                 |
| Gram-negative spiral organism survives under mucus using urease-generated ammonia | H pylori                                                      |
| Antral-predominant gastritis causes hypergastrinemia & ↑acid secretion            | Mechanism of duodenal ulceration                              |
| Corpus-predominant gastritis causes atrophy and hypochlorhydria                   | Increased gastric cancer risk                                 |
| Gastric ulcer appears benign at endoscopy                                         | Multiple biopsies and follow-up endoscopy are still mandatory |
| Anterior duodenal ulcer suddenly causes boardlike abdominal rigidity              | Perforation                                                   |
| Posterior duodenal ulcer causes massive hematemesis                               | Gastroduodenal artery erosion                                 |
| Persistent vomiting of food eaten the previous day with succussion splash         | Gastric outlet obstruction                                    |
| Severe multiple postbulbar ulcers with diarrhea                                   | Zollinger-Ellison syndrome                                    |
| Serum gastrin rises dramatically after secretin                                   | Gastrinoma                                                    |
| Hematemesis with tachycardia and hypotension                                      | Acute upper GI hemorrhage                                     |
| Bleeding ulcer fails endoscopic therapy                                           | Angiographic embolization or surgery                          |
| Abdominal & vasomotor Sx occur within 30 minutes after gastric surgery            | Early dumping syndrome                                        |
| Tremor and sweating occur 1-3 hours after a meal and improve with food            | Late dumping syndrome                                         |



**H pylori** eradication cures most H pylori-related ulcers, but every gastric ulcer requires multiple biopsies and documented healing because an ulcerated gastric carcinoma may temporarily heal with acid suppression while the underlying malignancy persists







# Decoding MCQs' through EFY Lens

THE PRIME SHOTS | UHS MOST REPEATED MCQs 2026-27

1. Young child with chronic diarrhea, steatorrhea, IDA and villous atrophy: **CELIAC DISEASE** (Gold standard Ix: **Duodenojejunal biopsy**; Serological IOC: **IgA anti-transglutaminase**) (Tx: **Gluten free diet**) (Skin Cx: **Dermatitis herpetiformis**)
2. Retrosternal heart burn with nocturnal regurgitation and epigastric pain: **GERD** (IOC: **Endoscopy** if any symptom persists; Gold standard: **24-hour pH monitoring**) (TOC: **PPI**) (Cx: **Barrett esophagus, Lower 1/3 adenocarcinoma**, Benign strictures)
3. Long history of progressive dysphagia for solids and liquids with nocturnal regurgitation and weight loss: **ACHALASIA** (IOC: **Manometry**) (Initial Tx: **Nitrates or CCBs for symptomatic relief**) (Cx: **Megaesophagus**, Middle 1/3 SCC) **Don't confuse it with esophageal cancer, the history for dysphagia will be short and IOC is esophageal biopsy**
4. Postprandial episodic epigastric pain: **PEPTIC ULCER DISEASE** (MCC: **H. Pylori duodenal ulcer**) (Gold standard Ix: **Culture**) (Tx: **Triple therapy i.e. PPI + Clarithromycin + Metronidazole**)
5. Relapses/remissions of bloody diarrhea, tenesmus and weight loss: **ULCERATIVE COLITIS** (IOC: **Endoscopic biopsy** showing **continuous** lesions) (Tx: **ASA + Steroids**) (Cx: **Toxic megacolon** and **Pyoderma gangrenosum**)
6. Chronic bloody diarrhea in young child with oral ulcerations: **CROHN'S DISEASE** (**Skip lesions** and **transmural inflammation**) (Cx: **Fistulae & Abscesses**)
7. Alcoholic presents with severe retching vomiting: **MALLORY WEISS TEARS**
8. Crampy abdominal pain relieved by defecation with no blood in stools and alterations of bowel habits: **IRRITABLE BOWEL SYNDROME** (Diagnosis is confirmed by **Rome-III criteria** + absence of alarm symptoms)
9. Foamy macrophages positive on PAS stain: **WHIPPLE DISEASE** (Tx: **IV/IM 2g ceftriaxone for 2 weeks**)
10. Treatment of pseudomembranous colitis caused by Clostridium difficile: **METRONIDAZOLE/VANCOMYCIN**

## Let's Practice the HYFs

A PROJECT BY DR. ALI RAZA CHAUDARY

### CONCEPT CHECK QUESTION 1

A 48-year-old man presents with progressive difficulty swallowing for the last four months. Initially, he had trouble swallowing solid foods such as meat and bread, but over the last few weeks he has also developed difficulty swallowing liquids. He has lost 12 kg during this period and reports reduced appetite. He is a chronic smoker and consumes alcohol regularly. Physical examination is unremarkable except for significant weight loss. Which of the following is the most likely diagnosis and the most appropriate initial investigation?

- |                                                        |                                                          |
|--------------------------------------------------------|----------------------------------------------------------|
| (A) Achalasia; esophageal manometry                    | (B) Esophageal carcinoma; upper GI endoscopy with biopsy |
| (C) GERD; empirical proton pump inhibitor therapy only | (D) Peptic ulcer disease; serum gastrin level            |
| (E) Irritable bowel syndrome; colonoscopy              |                                                          |

**The correct answer is B.** Progressive dysphagia that begins with solids and later involves liquids, especially when accompanied by significant weight loss and risk factors such as smoking and alcohol use, strongly suggests esophageal carcinoma. The investigation of choice is upper GI endoscopy with biopsy, which allows direct visualization and histological confirmation.

**Why other options are incorrect:** Option A typically presents with dysphagia to both solids and liquids from the onset and is diagnosed with manometry after endoscopic exclusion of malignancy. Option C may cause heartburn and mild dysphagia but does not explain marked weight loss and progressive obstruction. Option D presents with epigastric pain and dyspepsia rather than progressive dysphagia. Option E affects bowel habits and does not cause esophageal symptoms.

### CONCEPT CHECK QUESTION 2

A 36-year-old woman presents with chronic heartburn, sour regurgitation, and retrosternal burning that worsens after large meals and when lying down at night. Symptoms improve temporarily with antacids. She denies weight loss, anemia, hematemesis, or dysphagia. Examination is unremarkable. Which of the following is the most likely diagnosis and first-line treatment?

- |                                                              |                                                                    |
|--------------------------------------------------------------|--------------------------------------------------------------------|
| (A) Peptic ulcer disease; H. pylori eradication in all cases | (B) Gastroesophageal reflux disease; proton pump inhibitor therapy |
| (C) Esophageal cancer; urgent surgery                        | (D) Achalasia; pneumatic dilatation                                |
| (E) Gastric carcinoma; chemotherapy                          |                                                                    |

**The correct answer is B.** This patient has classical GERD, characterized by heartburn and acid regurgitation that worsen after meals and in the supine position. In the absence of alarm symptoms, the first-line treatment is lifestyle modification and a proton pump inhibitor (PPI) trial.

**Why other options are incorrect:** Option A is reserved for confirmed or suspected H. pylori-associated ulcer disease. Option C is unlikely without progressive dysphagia or weight loss. Option D presents with dysphagia rather than heartburn. Option E would usually present with alarm symptoms such as weight loss, anemia, or persistent vomiting.





## CONCEPT CHECK QUESTION 3

A 24-year-old university student presents with recurrent abdominal pain for the last year. The pain is relieved after defecation and is associated with alternating constipation and diarrhea. She reports that symptoms worsen during periods of stress and examinations. There is no nocturnal diarrhea, rectal bleeding, fever, weight loss, or anemia. Physical examination and basic laboratory investigations are normal. Which of the following is the most likely diagnosis?

- (A) Crohn disease
- (B) Ulcerative colitis
- (C) Irritable bowel syndrome
- (D) Intestinal tuberculosis
- (E) Colorectal carcinoma

**The correct answer is C.** This patient fulfills classical features of irritable bowel syndrome (IBS). The hallmark is recurrent abdominal pain associated with altered bowel habits and improvement after defecation, without objective evidence of inflammation or alarm features.

**Why other options are incorrect:** Option A and B usually have inflammatory features such as weight loss, anemia, rectal bleeding, elevated inflammatory markers, or endoscopic abnormalities. Option D commonly causes constitutional symptoms, strictures, or abdominal masses. Option E is unlikely in a young patient without alarm symptoms.

## CONCEPT CHECK QUESTION 4

A 28-year-old man presents with chronic diarrhea, weight loss, abdominal bloating, and fatigue. He reports passing bulky, foul-smelling stools that are difficult to flush. Laboratory investigations reveal iron deficiency anemia and low serum folate levels. Duodenal biopsy shows villous atrophy with crypt hyperplasia. Which of the following is the most likely diagnosis?

- (A) Irritable bowel syndrome
- (B) Acute gastroenteritis
- (C) Celiac disease causing malabsorption
- (D) Ulcerative colitis
- (E) Hemorrhoids

**The correct answer is C.** This patient has a malabsorption syndrome due to celiac disease. Classical findings include chronic diarrhea, steatorrhea, weight loss, nutritional deficiencies, and villous atrophy on small intestinal biopsy. Iron deficiency anemia may be the presenting feature.

**Why other options are incorrect:** Option A does not cause malabsorption or nutritional deficiencies. Option B is acute and self-limited. Option D primarily affects the colon and does not cause villous atrophy. Option E causes rectal bleeding but not steatorrhea or weight loss.

## CONCEPT CHECK QUESTION 5

A 29-year-old man presents with chronic abdominal pain, weight loss, intermittent low-grade fever, and diarrhea for several months. Colonoscopy shows patchy areas of inflammation with skip lesions and deep linear ulcers involving the terminal ileum. Biopsy demonstrates transmural inflammation and non-caseating granulomas. Which of the following is the most likely diagnosis?

- (A) Ulcerative colitis
- (B) Crohn disease
- (C) Acute infective colitis
- (D) Irritable bowel syndrome
- (E) Peptic ulcer disease

**The correct answer is B.** This patient has Crohn disease, an inflammatory bowel disease that may involve any part of the gastrointestinal tract. Characteristic features include skip lesions, transmural inflammation, terminal ileal involvement, fistula formation, strictures, and non-caseating granulomas.

**Why other options are incorrect:** Option A typically causes continuous colonic involvement beginning at the rectum and is limited to the mucosa. Option C is usually acute rather than chronic. Option D does not produce endoscopic inflammation or granulomas. Option E affects the stomach or duodenum and does not cause chronic inflammatory ileocolitis.



# E

# ACUTE RESPIRATORY TRACT INFECTIONS & CONTROL OF DIARRHEAL DISEASES



**EPISODE TEXTBOOKS © 2026-27 | PEDIATRICS-I**

Dr. Ali Raza Chaudary, Dr. M. K. Chaudary

|               |                                          |           |
|---------------|------------------------------------------|-----------|
| <b>PI-0XX</b> | Acute Respiratory Tract Infection (ARTI) | <b>72</b> |
| <b>PI-0XX</b> | Control of Diarrheal Diseases (CDD)      | <b>73</b> |

## TO THE READER,

This book represents the consolidation of 10 years in the medical field helping medical students. You can be fully confident that you have, in one volume, **EVERYTHING** you need to do well in your **professional exams**.

A PROJECT BY

DR. ALI RAZA CHAUDARY



# Acute Respiratory Tract Infection (ARTI)

## SPECIFIC LEARNING OUTCOMES 2026

There are no defined SLOs in Syllabus.

**Acute respiratory tract infections (ARTI)** are acute infections of the respiratory tract ranging from **common cold** to **pneumonia and severe pneumonia**. In children under 5 years, WHO approach focuses on **cough or difficult breathing**, counting respiratory rate, looking for chest indrawing, and identifying danger signs. WHO notes that pneumonia in children with cough/difficult breathing is diagnosed by **fast breathing** or **lower chest wall indrawing**, while severe cases need facility care with oxygen/antibiotics. Generally, the RTI are classified as follow;

| Upper RTI                                                                                                                                        | Lower RTI                                                                                                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Common cold</li> <li>Pharyngitis</li> <li>Tonsillitis</li> <li>Otitis media</li> <li>Sinusitis</li> </ul> | <ul style="list-style-type: none"> <li>Pneumonia</li> <li>Bronchiolitis</li> <li>Croup</li> <li>Severe pneumonia</li> </ul> |

## WHO GUIDELINES FOR ARTI

| Assessment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Red Code<br>SEVERE PNEUMONIA / VERY SEVERE DISEASE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Yellow Code<br>PNEUMONIA                                                                                                                                                                                                                                                                                                                                                                                               | Green Code<br>NO PNEUMONIA:<br>COUGH/COLD                                                                                                                                                                                                                                                                                                                                                                | Prevention                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Assessment of cough or difficult breathing</b></p> <p><b>Ask</b></p> <ul style="list-style-type: none"> <li>Duration of cough</li> <li>Difficulty breathing</li> <li>Fever</li> <li>Feeding difficulty</li> <li>Wheeze</li> <li>Immunization status</li> <li>Previous similar episodes</li> </ul> <p><b>Look, listen &amp; count</b></p> <ul style="list-style-type: none"> <li>Count RR for 1 full min</li> <li>Look for chest indrawing</li> <li>Look/listen for stridor</li> <li>Look for wheeze</li> <li>Check SpO<sub>2</sub> if available</li> <li>Check general danger signs</li> </ul> | <ul style="list-style-type: none"> <li>General danger sign*                             <ul style="list-style-type: none"> <li>Unable to drink or breastfeed</li> <li>Vomits everything</li> <li>Convulsions</li> <li>Lethargic or unconscious</li> </ul> </li> <li>Stridor when calm</li> <li>Hypoxaemia</li> <li>Severe respiratory distress</li> </ul>  <ul style="list-style-type: none"> <li><b>Urgent referral/admission</b></li> <li>Oxygen if SpO<sub>2</sub> low or distress</li> <li>First dose injectable antibiotic before referral if possible</li> <li>Maintain airway</li> <li>Treat fever</li> <li>Monitor for complications</li> </ul> | <ul style="list-style-type: none"> <li>Fast breathing* ±</li> <li>Lower chest wall indrawing without danger signs</li> </ul>  <ul style="list-style-type: none"> <li><b>Oral amoxicillin**</b></li> <li>Continue feeding and fluids</li> <li>Treat fever</li> <li>Follow-up after 2-3 days</li> <li>Counsel danger signs</li> </ul> | <ul style="list-style-type: none"> <li>Cough or cold only</li> </ul>  <ul style="list-style-type: none"> <li><b>Home care</b></li> <li>Continue feeding and fluids</li> <li>Saline nose drops if blocked nose</li> <li>Avoid unnecessary antibiotics</li> <li>Return if breathing becomes fast/difficult</li> </ul> | <ul style="list-style-type: none"> <li>Exclusive breastfeeding for 6 months</li> <li>Good nutrition</li> <li>Immunization:                             <ul style="list-style-type: none"> <li>Pentavalent/Hib</li> <li>Pneumococcal</li> <li>Measles</li> <li>Pertussis</li> <li>Influenza</li> </ul> </li> <li>Reduce indoor smoke and tobacco exposure</li> <li>Hand hygiene</li> <li>Reduce overcrowding</li> </ul> |

\*Fast breathing cutoffs: <2M ≥60 minutes – 2M to <12M ≥50/min – ≥12M to 5Y ≥40/min

\*\*WHO states that the first-line antibiotic of choice for childhood pneumonia is **amoxicillin dispersible tablets**.

## EFY CLINICAL CLINCHERS

|                                                      |                                                            |
|------------------------------------------------------|------------------------------------------------------------|
| Child with cough, fever, and fast breathing          | Acute Respiratory Tract Infection                          |
| Fast breathing with no chest indrawing               | Pneumonia                                                  |
| Chest indrawing, stridor, cyanosis, lethargy         | Severe pneumonia                                           |
| Wheeze with prolonged expiration                     | Viral bronchiolitis/asthma pattern                         |
| Runny nose + mild cough without respiratory distress | Upper respiratory tract infection                          |
| Oxygen saturation low with grunting/nasal flaring    | Severe respiratory distress                                |
| Main treatment of pneumonia                          | Amoxicillin                                                |
| Danger signs in ARTI                                 | Inability to drink, convulsions, lethargy, severe distress |



**WHO child survival approach:** in ARTI, count breaths and assess danger signs



# Control of Diarrheal Diseases (CDD)

**Diarrhea** is passage of **three or more loose or watery stools in 24 hours**, or more frequent passage than normal for that child. WHO/UNICEF emphasize that diarrhea control depends mainly on ORS, continued feeding or breastfeeding, selective antibiotics, and zinc for 10–14 days.

## SPECIFIC LEARNING OUTCOMES 2026

There are no defined SLOs in Syllabus.

### TYPES OF DIARRHEA

- **Acute watery diarrhea:** Watery stool, usually <14 days
- **Dysentery:** Blood in stool
- **Persistent (chronic) diarrhea:** Diarrhea lasting ≥14 days

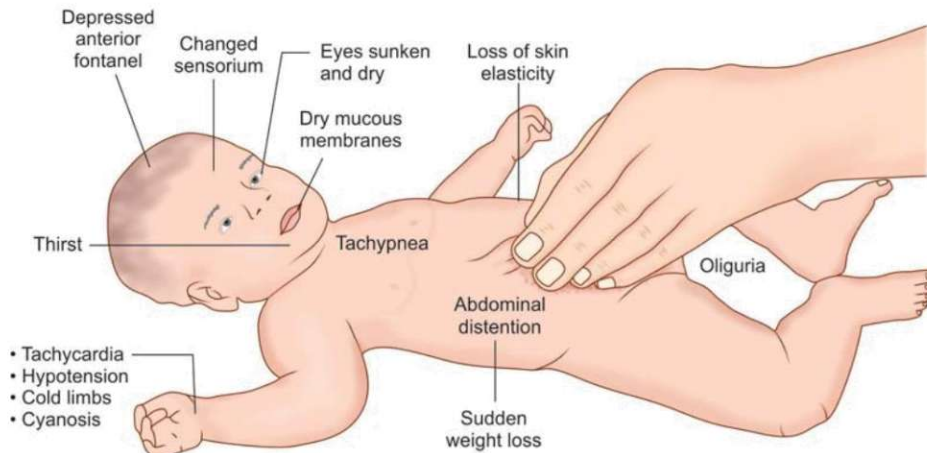


Fig. XX.1: Signs of severe diarrheal dehydration

### WHO GUIDELINES FOR CDD

| Assessment                                                                                                                                                           | Red Code<br>SEVERE DEHYDRATION                                                                                                                                                                                                                                                                                                                  | Yellow Code<br>SOME DEHYDRATION                                                                                                                                                                                                                          | Green Code<br>NO DEHYDRATION                                                                                                                                                                                                                                                                                                                                                                                                                                     | Prevention                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                      | <ul style="list-style-type: none"> <li>• Lethargic/unconscious</li> <li>• Eyes: Sunken</li> <li>• Thirst: Unable or drinks poorly</li> <li>• Skin pinch: Goes back very slowly</li> </ul>                                                                                                                                                       | <ul style="list-style-type: none"> <li>• Restless/irritable</li> <li>• Eyes: Sunken</li> <li>• Thirst: Drinks eagerly/thirsty</li> <li>• Skin pinch: Goes back slowly</li> </ul>                                                                         | <ul style="list-style-type: none"> <li>• Well, alert</li> <li>• Eyes: Normal</li> <li>• Thirst: Drinks normally</li> <li>• Skin pinch: Goes back quickly</li> </ul>                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                           |
| <b>Assessment signs of dehydration</b> <ul style="list-style-type: none"> <li>• General condition</li> <li>• Eyes</li> <li>• Thirst</li> <li>• Skin pinch</li> </ul> | <p><b>PLAN C</b></p> <ul style="list-style-type: none"> <li>• <b>Urgent IV fluid (100 ml/kg)*</b> <ul style="list-style-type: none"> <li>– Ringer lactate preferred</li> <li>– Normal saline if RL unavailable</li> </ul> </li> <li>• ORS as soon as child can drink</li> <li>• Reassess frequently</li> <li>• Admit/refer if needed</li> </ul> | <p><b>PLAN B</b></p> <ul style="list-style-type: none"> <li>• <b>ORS 75 mL/kg over 4 hours</b></li> <li>• Reassess after 4 hours</li> <li>• Continue breastfeeding</li> <li>• If vomiting occurs: wait briefly, then give small frequent sips</li> </ul> | <p><b>PLAN A</b></p> <ul style="list-style-type: none"> <li>• <b>Home care</b></li> <li>• Give extra fluids</li> <li>• Continue feeding***</li> <li>• Give ORS after each loose stool</li> <li>• Give zinc for 10–14 days**</li> <li>• Counsel danger signs</li> <li>• <b>ORS after each loose stool</b> <ul style="list-style-type: none"> <li>– &lt;2 Y: 50–100 mL</li> <li>– 2–10 Y: 100–200 mL</li> <li>– &gt;10 Y: As much as wanted</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• ORS + zinc availability</li> <li>• Safe water</li> <li>• Sanitation</li> <li>• Hand washing</li> <li>• Breastfeeding</li> <li>• Nutrition</li> <li>• Rotavirus vaccine</li> <li>• Food hygiene</li> <li>• Health education</li> <li>• Antibiotics****</li> </ul> |

\*IV fluid calculations: 100 ml/kg [Infants: First 30 ml/kg in 1 h & Rest 70 ml/kg in 5 h] [Children 1–5 years: First 30 ml/kg in 30 min & Rest 70 ml/kg in 2.5 h]

\*\*Zinc supplementation: WHO/UNICEF recommend zinc supplementation during diarrheal illness because it reduces severity and duration and helps reduce subsequent episodes.

• <6 months: 10 mg daily for 10–14 days      • ≥6 months: 20 mg daily for 10–14 days

\*\*\*Feeding during diarrhea

- Continue breastfeeding
- Avoid starvation
- Continue age-appropriate diet
- Avoid sugary drinks & carbonated drinks
- Give small frequent meals
- Give extra food after recovery for catch-up growth

\*\*\*\*Antibiotics in diarrhea: Not in routine (Most childhood diarrhea does **not** need antibiotics). **Give antibiotics in**

- Dysentery
- Suspected cholera with severe dehydration
- Proven specific bacterial infection
- Severe systemic illness





# Pathogenesis

## ETIOLOGY OF ACUTE DIARRHEA

### INFECTIOUS CAUSES

#### Bacteria

- E. coli (25%) (invasive, enterotoxigenic, enteropathogenic or hemorrhagic O157:H7)
- Salmonella (10%)
- Shigella (5%)
- Vibrio cholerae (5-10%)
- Staphylococcus aureus (food poisoning)
- Campylobacter jejuni
- Yersinia enterocolitica

#### Viruses

- Rota virus (40%)
- Enteric adenovirus

#### Parasites

- Entamoeba histolytica
- Giardia lamblia
- Cryptosporidium

#### Fungi

- Candida albicans

### NON-INFECTIOUS CAUSES

- Otitis media, Pneumonia, UTI
- Dietary factors: Over-feeding, Starvation, Food poisoning, Food allergy
- Antibiotics

## VARIOUS TYPES OF ORS

| Content   | RESOMAL     | Standard (ORS) | Hypo-Osmolar (ORS) |
|-----------|-------------|----------------|--------------------|
| Sodium    | 45 mEq/L    | 90 mEq/L       | 75 mEq/L           |
| Potassium | 40 mEq/L    | 20 mEq/L       | 20 mEq/L           |
| Chloride  | 70 mEq/L    | 80 mEq/L       | 65 mEq/L           |
| Citrate   | 7 mEq/L     | 10 mEq/L       | 10 mEq/L           |
| Magnesium | 3 mEq/L     | -              | -                  |
| Zinc      | 0.3 mEq/L   | -              | -                  |
| Copper    | 0.045 mEq/L | -              | -                  |

## UHS 5-OPTIONED MULTIPLE CHOICE QUESTIONS

**UHS-A12:** A 5-year-old boy referred for recurrent diarrhea. For prevention of diarrhea, you will suggest:

- a) Rota virus vaccine
- b) Lactose free formula
- c) Zinc supplementation
- d) High protein diet
- e) ORS

**EFY KEY 2026:** c) Zinc supplementation is recommended for the prevention of diarrhea in children, as it has been shown to reduce duration and severity. Rota virus vaccine & ORS are also recommended for the prevention and treatment of diarrhea, respectively.

**UHS-A13:** A one year child who has diarrhea is lethargic has sunken eyes and his skin pinch goes back in >2 sec. He has:

- a) Severe dehydration
- b) Mild dehydration
- c) No dehydration
- d) Moderate dehydration
- e) Some dehydration

**EFY KEY 2026:** a) Severe dehydration. The signs of a one-year-old child with diarrhea being lethargic, having sunken eyes, and skin pinch going back in > 2 seconds indicate severe dehydration.

**UHS-A13:** Sodium concentration in low-osmolar ORS is:

- a) 20 mmol/L
- b) 65 mmol/L
- c) 85 mmol/L
- d) 75 mmol/L
- e) 90 mmol/L

**EFY KEY 2026:** d) 75 mmol/L. Low-osmolar oral rehydration solution is a solution used to treat dehydration caused by diarrhea. It contains a specific concentration of sodium, potassium, and other electrolytes.

**UHS-S13:** The chloride content of oral rehydration fluid is (mEq/L):

- a) 20
- b) 30
- c) 80
- d) 90
- e) 110

**EFY KEY 2026:** c) 80. Oral rehydration fluid (ORF) is used to replace fluids and electrolytes lost due to diarrhea, vomiting, or sweating.

**UHS-S13:** A one and a half-year-old severely dehydrated child weighing 10 kg require Ringer's lactate:

- a) 300 ml in 1 hour and then 700 ml in 5 hours
- b) 300 ml in ½ hour and then 700 ml in 2½ hours
- c) 300 ml in 1 hour and then 700 ml in 3 hours
- d) 300 ml in 1 hour and then 700 ml in 2 hours
- e) 300 ml in ½ hour and then 700 ml in 5 hours

**EFY KEY 2026:** b) 300 ml in ½ hour and then 700 ml in 2½ hours. The treatment of severe dehydration in children involves rapid rehydration with intravenous fluids. The recommended fluid for initial rehydration is Ringer lactate, which should be given rapidly over 30 minutes to 1 hour, followed by maintenance fluids.

## UHS OPTIONLESS MULTIPLE CHOICE QUESTIONS

**UHS-A15:** Signs of dehydration: Hypotension

**UHS-A17:** Thirsty and can take water: Some/moderate dehydration

**UHS-A18:** Fluid for severe dehydration in 8-month-old: Ringer lactate 30 ml/kg in 1 h and 70 ml/kg in 5 h

**UHS-S20:** Skin pinch goes back very slowly: Severe dehydration

**UHS-A21:** Potassium in WHO ORS: 20 mmol/L

**UHS-A23:** Diagnosis of child who is unable to drink water and very slow skin pinch response: Severe dehydration

## EFY CLINICAL CLINCHERS

|                                            |                                                 |
|--------------------------------------------|-------------------------------------------------|
| Child with frequent loose watery stools    | Control of Diarrheal Disease                    |
| Sunken eyes, thirst, reduced skin turgor   | Some dehydration                                |
| Lethargy, weak pulse, very slow skin pinch | Severe dehydration                              |
| Bloody diarrhea with fever/tenesmus        | Dysentery                                       |
| Main treatment of diarrhea                 | Oral Rehydration Solution                       |
| Zinc supplementation for 10-14 days        | Reduces duration/severity of diarrhea           |
| Prevention strategies                      | Breastfeeding, vaccination, hygiene, safe water |



**WHO child survival approach:** in diarrhea, classify dehydration and treat early with ORS, zinc, feeding and fluids.





ARTI &amp; CDD | A PROJECT BY DR. ALI RAZA CHAUDARY



# Decoding MCQs' through EFY Lens

THE PRIME SHOTS | UHS MOST REPEATED MCQs 2026-27

1. Danger sign + cough/difficulty breathing, stridor in calm child or severe chest indrawing: **SEVERE PNEUMONIA / VERY SEVERE DISEASE**
2. First-line antibiotic for childhood pneumonia as per WHO/IMNCI: **ORAL AMOXICILLIN**
3. Prevention of ARTI: **BREASTFEEDING + VACCINATION + AVOID SMOKE + HAND HYGIENE + GOOD NUTRITION**
4. Diarrhea + restless/irritable + sunken eyes + drinks eagerly + slow skin pinch: **SOME DEHYDRATION** (Mx: **PLAN B: ORS 75 mL/kg** over 4 hours)
5. Diarrhea + lethargic/unconscious + unable to drink + very slow skin pinch: **SEVERE DEHYDRATION** (Mx: **PLAN C: IV Ringer Lactate** / Normal Saline + ORS as soon as child can drink)

## Let's Practice the HYFs

A PROJECT BY DR. ALI RAZA CHAUDARY

### CONCEPT CHECK QUESTION 1

A 10-month-old infant is brought with cough and difficulty breathing for 2 days. He is able to drink breast milk and has no convulsions. On examination, respiratory rate is 58/min, there is no chest indrawing, no stridor, and the child is alert. According to ARTI/IMNCI principles, which of the following is the most appropriate classification and management?

- |                                         |                                                       |
|-----------------------------------------|-------------------------------------------------------|
| (A) Severe pneumonia; urgent referral   | (B) Pneumonia; oral antibiotic and follow-up          |
| (C) No pneumonia; cough and cold only   | (D) Bronchial asthma; start long-term inhaled steroid |
| (E) Tuberculosis; start anti-TB therapy |                                                       |

**The correct answer is B.** This infant has cough with fast breathing for age, but no chest indrawing or danger signs. This fits pneumonia, which is managed with an appropriate oral antibiotic, caregiver counseling, and follow-up.

**Why other options are incorrect:** Option A needs severe signs such as chest indrawing, stridor at rest, inability to drink, convulsions, or lethargy. Option C is incorrect because fast breathing is present. Option D cannot be diagnosed from this acute presentation alone. Option E needs chronic symptoms or TB contact, not an acute 2-day illness.

### CONCEPT CHECK QUESTION 2

A 2-year-old child presents with cough, fever, and difficulty breathing. On examination, the child is lethargic, unable to drink, and has lower chest wall indrawing. Respiratory rate is 52/min. According to ARTI case management, what is the best immediate action?

- |                                                                         |                                                   |
|-------------------------------------------------------------------------|---------------------------------------------------|
| (A) Give cough syrup and send home                                      | (B) Start oral antibiotic and review after 5 days |
| (C) Classify as severe pneumonia/very severe disease and refer urgently | (D) Give only antipyretic and advise fluids       |
| (E) Wait for chest X-ray before any treatment                           |                                                   |

**The correct answer is C.** Lethargy, inability to drink, and lower chest indrawing are danger signs. This child should be classified as severe pneumonia or very severe disease and needs urgent referral after pre-referral treatment.

**Why other options are incorrect:** Option A is unsafe and symptomatic only. Option B is inadequate because the child has danger signs. Option D ignores respiratory distress and severe illness. Option E delays emergency management.

### CONCEPT CHECK QUESTION 3

A 14-month-old child is brought with watery diarrhea for 2 days. The child is restless, drinks eagerly, has sunken eyes, and the skin pinch goes back slowly. There is no blood in stool. According to CDD principles, which of the following is the most appropriate management plan?

- |                                         |                                           |
|-----------------------------------------|-------------------------------------------|
| (A) Plan A: home fluids only            | (B) Plan B: ORS therapy with reassessment |
| (C) Plan C: immediate IV fluids only    | (D) Antibiotics for dysentery             |
| (E) Stop feeding until diarrhea settles |                                           |

**The correct answer is B.** Restlessness, eager drinking, sunken eyes, and slow skin pinch indicate some dehydration. The correct treatment is ORS according to Plan B, continued feeding, zinc supplementation, and reassessment.

**Why other options are incorrect:** Option A is for no dehydration. Option C is for severe dehydration. Option D is used when blood is present in stool. Option E is harmful; feeding and breastfeeding should continue.



#### CONCEPT CHECK QUESTION 4

**A 3-year-old child presents with acute diarrhea and lethargy. The mother says the child is unable to drink. On examination, the eyes are very sunken and the skin pinch goes back very slowly. Which of the following is the most appropriate immediate management?**

- (A) Start oral zinc only
- (B) Give ORS at home and review next day
- (C) Start Plan C with urgent IV fluids
- (D) Give antidiarrheal drug
- (E) Start oral metronidazole only

**The correct answer is C.** Lethargy, inability to drink, very sunken eyes, and very slow skin pinch indicate severe dehydration. Immediate Plan C IV fluid management is required, with close monitoring and continued ORS when able.

**Why other options are incorrect:** Option A is supportive but not enough. Option B is unsafe in severe dehydration. Option D is not recommended in young children. Option E may be indicated for selected infections but does not correct life-threatening dehydration.

#### CONCEPT CHECK QUESTION 5

**A 4-year-old child has diarrhea for 3 days with visible blood in stool, fever, and abdominal cramps. The child is drinking adequately and has no signs of severe dehydration. According to CDD case management, which of the following is the most appropriate classification and treatment priority?**

- (A) Acute watery diarrhea; ORS only
- (B) Dysentery; give appropriate antibiotic plus ORS and zinc
- (C) Persistent diarrhea; give lactose-free diet only
- (D) Cholera; start IV fluids regardless of hydration
- (E) Giardiasis; give albendazole only

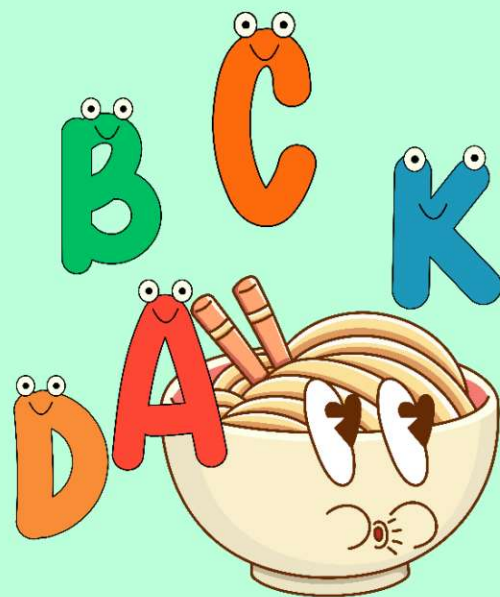
**The correct answer is B.** Visible blood in stool indicates dysentery, commonly due to invasive bacterial infection such as *Shigella*. Management includes appropriate antibiotic therapy, ORS according to hydration status, zinc, continued feeding, and follow-up.

**Why other options are incorrect:** Option A ignores blood in stool. Option C requires diarrhea lasting 14 days or more. Option D is suspected in profuse watery diarrhea with severe dehydration. Option E does not fit bloody diarrhea and albendazole is not treatment for dysentery.





# NUTRITION, FLUID, ELECTROLYTE & ACID-BASE BALANCE



**EPISODE TEXTBOOKS © 2026-27 | SURGERY-I**

Dr. Ali Raza Chaudary, Dr. M. K. Chaudary

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| <b>S1-011</b> | Malnutrition in Surgical Patients | <b>22</b> |
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## TO THE READER,

This book represents the consolidation of 10 years in the medical field helping medical students. You can be fully confident that you have, in one volume, **EVERYTHING** you need to do well in your **professional exams**.

A PROJECT BY

DR. ALI RAZA CHAUDARY



# Nutritional Support

## SPECIFIC LEARNING OUTCOMES 2026

- Compare enteral vs. parenteral nutrition.
- Describe complications.

**Artificial nutritional support** is considered when a surgical patient cannot meet nutritional requirements through normal dietary intake. It should be considered after **5 days or more of inadequate intake**. **Enteral nutrition is preferred whenever the gastrointestinal tract is functional**, while parenteral nutrition is used when adequate intestinal feeding or absorption is not possible.

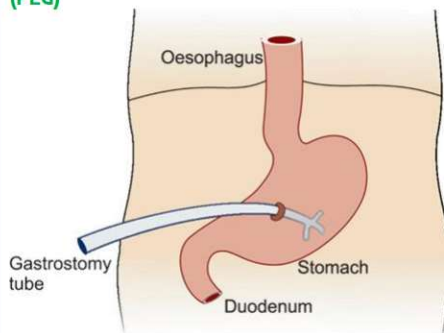


### STEPWISE APPROACH TO NUTRITION THERAPY



## KEY FACTS

### PERCUTANEOUS ENDOSCOPIC GASTROSTOMY (PEG)



In case of nutritional therapy for **4-6 weeks**, PEG is indicated.

#### COMPLICATIONS OF PEG

- Necrotizing fasciitis
- Abscess
- Sepsis
- Persistent gastric fistula



### MANAGEMENT OF COMPLICATIONS OF ENTERAL NUTRITION

- To prevent **diarrhea**, use half-feed strengths and decrease the rate of feed as per patient tolerance
- To prevent **aspiration**, patient should be kept in semi-recumbent position i.e. 45°
- To prevent **handling contamination**, keep the apparatus in sealed containers at 4°C and discard once open
- To prevent tube **blockage**, flush tube twice a day or use chymotrypsin
- **Position** of NG tube is confirmed by x-ray after insertion. Moreover, A gastric aspirate **pH <5** supports gastric placement.

### PARENTERAL NUTRITION



### ENTERAL NUTRITION

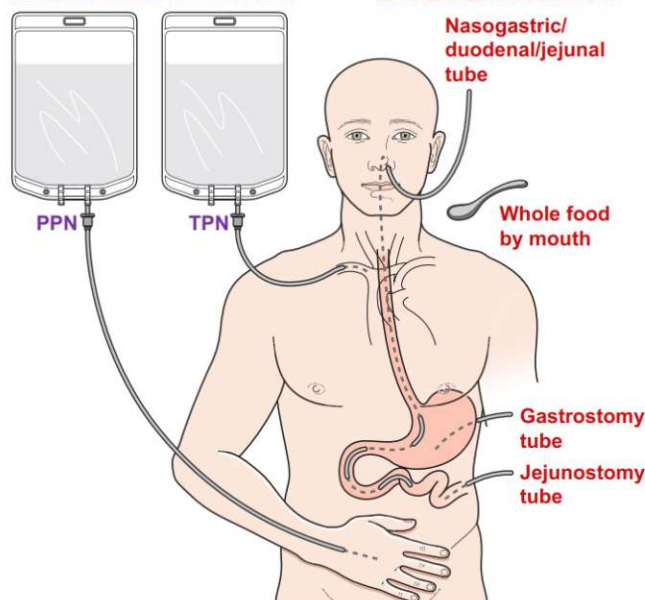


Fig. 13.1: Types of nutritional supports

### ENTERAL NUTRITION

**Enteral nutrition** is the delivery of nutrients into the gastrointestinal tract.

#### METHODS

- **Sip feeding**
- **Tube feeding:** Nasogastric tube (NGT), Nasoduodenal tube, Nasojejunal tube
- **Tube gastrostomy:** Percutaneous endoscopic gastrostomy (PEG), Surgical gastrostomy, Fluoroscopic gastrostomy
- **Tube jejunostomy:** Percutaneous endoscopic jejunostomy (PEJ), Surgical jejunostomy, Fluoroscopic jejunostomy

#### INDICATIONS

- Inadequate intake from 5-7 days
- Dysphagia for solids
- Malnutrition
- Unconscious patient and post-op feeding
- Low output fistula (**<200 ml**)

#### CONTRAINDICATIONS

- Intestinal obstruction
- Severe diarrhea
- High output fistula (**>500 ml**)
- Gastrointestinal bleed
- Paralytic ileus
- Low cardiac output, hemodynamically unstable patient

#### COMPLICATIONS

| Tube-related                                                                                                                                                                                         | GIT                                                                                                                                                                        | Metabolic (biochemical)                                                                                                                                        | Infective                                                                                                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Malposition</li> <li>• Displacement</li> <li>• Blockage</li> <li>• Breakage/leakage</li> <li>• Local complications (e.g. erosion of skin/mucosa)</li> </ul> | <ul style="list-style-type: none"> <li>• <b>Diarrhea</b></li> <li>• Bloating, N&amp;V</li> <li>• Abdominal cramps</li> <li>• Aspiration</li> <li>• Constipation</li> </ul> | <ul style="list-style-type: none"> <li>• Electrolyte disorders</li> <li>• Vitamin, mineral, trace element deficiencies</li> <li>• Drug interactions</li> </ul> | <ul style="list-style-type: none"> <li>• Exogenous (handling contamination)</li> <li>• Endogenous (patient)</li> </ul> |



## PARENTERAL NUTRITION

**Parenteral nutrition** is the intravenous administration of nutrients when adequate nutrition cannot be provided or absorbed through the gastrointestinal tract. It may be given as:

- **Supplemental parenteral nutrition:** Given with enteral nutrition
- **Total parenteral nutrition (TPN):** Sole source of nutrition

### ■ ROUTES

- Central venous catheter i.e. subclavian or jugular vein
- Peripherally inserted central catheter
- Hickman catheter or implanted port (**for long-term support**)
- Peripheral venous catheter (**for short-term, low-osmolarity feeding**)

### ■ COMPOSITION

- **Macronutrients:** Proteins, Glucose, Lipid emulsions
- **Micronutrients:**
  - a. Electrolytes: Na, K, Ca, PO<sub>4</sub>, Mg
  - b. Trace Elements: Zn, Cu, Se, Fe
  - c. Vitamins: B12, folic acid, & multivitamins

### ■ INDICATIONS

- Failure or contraindication for any enteral nutrition for 7-10 days
- High output fistulas: Abdominal, Duodenal, Biliary, Pancreatic
- Major abdominal surgeries
- Septicemia
- Short bowel syndrome
- Severe pancreatitis, bowel ischemia, peritonitis, ileus
- Massive GI bleeding, unstable hemodynamically
- Multiorgan failure, head injury, severe burns

### ■ WEANING STRATEGY

- Gradual transition to oral or enteral feeding when possible

### ■ COMPLICATIONS

| Nutrient Deficiency                                                                                                                                                                                                                | Overfeeding                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Sepsis                                                                                                          | Line-related                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Refeeding syndrome</li> <li>• Chronic deficiency               <ul style="list-style-type: none"> <li>– Essential FAs</li> <li>– Zn</li> <li>– Mineral &amp; trace</li> </ul> </li> </ul> | <b>EXCESS GLUCOSE</b> <ul style="list-style-type: none"> <li>• Hyperglycemia</li> <li>• Hyperosmolar dehydration</li> <li>• Hepatic steatosis</li> <li>• Hypercapnia</li> <li>• Electrolyte imbalance</li> </ul> <b>EXCESS FAT</b> <ul style="list-style-type: none"> <li>• Hypercholesterolemia</li> <li>• Lipoprotein X formation</li> <li>• Hypertriglyceridemia</li> <li>• Hypersensitivity</li> </ul> <b>EXCESS AMINO ACIDS</b> <ul style="list-style-type: none"> <li>• Hyperchloraemic acidosis</li> <li>• Hypercalcemia</li> <li>• Aminoacidemia</li> <li>• Uremia</li> </ul> | <ul style="list-style-type: none"> <li>• Catheter-related sepsis</li> <li>• ↑Risk of systemic sepsis</li> </ul> | <b>ON INSERTION</b> <ul style="list-style-type: none"> <li>• Pneumothorax</li> <li>• Adjacent artery damage</li> <li>• Air embolism</li> <li>• Thoracic duct damage</li> <li>• Cardiac tamponade</li> <li>• Pleural effusion</li> <li>• Hydromediastinum</li> </ul> <b>LONG-TERM USE</b> <ul style="list-style-type: none"> <li>• Occlusion</li> <li>• Venous thrombosis</li> </ul> |

## MONITORING IN NUTRITIONAL SUPPORT

### ■ DAILY

They could be converted to weekly once the patient is established on a stable feeding regimen.

- Pulse, Blood pressure and Temperature
- Body weight
- Fluid balance (volume of urine ± urine and intestinal losses)
- Quantity and type of food consumed (**if allowed to eat**)
- Plasma levels:
  - a. Sodium, potassium, urea and creatinine
  - b. Magnesium and phosphate (**if at risk of refeeding syndrome**)
  - c. **Glucose**
  - d. LFTs
  - e. CRP

### ■ WEEKLY TO FORTNIGHTLY

- CBC
- Calcium, zinc, copper
- Albumin
- Thiamine, B12, folic acid
- Triglycerides

## QUICK TIP

### TYPES OF NUTRITIONAL FLUIDS FOR TPN

- **Solutions with lipids (3 in 1)**
  - Dextrose: 55-60%
  - Amino acids: 20-25%
  - Lipids: 20%
- **Solutions without lipids (2 in 1)**
  - Dextrose: 75-80%,
  - Amino acids: 20-25%

### CALORIC YIELDS/DENSITIES IN THESE FLUIDS

- Dextrose: 3.4 kcal/g
- Protein: 3.3 kcal/g
- Fat: 10 kcal/g

Normally, carbohydrates, proteins and lipids provide 3.4, 4 and 9 kcal of energy per gram respectively but **due to hydration status of free amino acids**, they provide 3.4, 3.3 and 10 kcal or energy per gram respectively.



### MANAGEMENT OF COMPLICATIONS OF TPN

- Glutamine can be used to treat **overfeeding**.
- For **refeeding syndrome**, match intake and requirements, avoid overfeeding, increase calories slowly, supplement vitamins, and treat hypophosphatemia & hypomagnesemia.
- In **hepatic steatosis**, decrease fat content or infusion of fat-free TPN. If liver enzymes still deteriorate, then discontinue TPN temporarily.
- Major complication in peripheral venous access is **thrombophlebitis** (prevented by using short cannula on cyclical basis over 12 hours i.e. contralateral arm)
- Major complication in central venous access is **sepsis**. It can be prevented by:
  - Infraclavicular subclavian approach
  - Preferring Hickman lines
  - Post insertion CXR to rule out pneumothorax and to confirm tip of catheter in distal SCV
  - PICC line (cephalic to brachiocephalic vein or SVC)



■ 3-6 MONTHLY

- Ferritin
- Selenium, manganese
- 25-hydroxyvitamin D

**UHS 5-OPTIONED MULTIPLE CHOICE QUESTIONS**

**UHS-M07: A 50-year-old woman undergoes laparotomy for adhesolysis. A feeding jejunostomy is also done. When can feeding begin, using elemental formulae?**

- a) 4-6 hours
- b) 48 hours
- c) 3 days
- d) 5 days
- e) 7 days

**EFY KEY 2026:** a) 4-6 hours. Early enteral feeding is recommended in patients who undergo laparotomy as it has been shown to reduce postoperative complications and improve outcomes.

**UHS-M09: A 50-year-old house lady who is in coma due to head injury, is on enteral feeding with formula diet for last one week and is having diarrhea ever since. The best management would be to:**

- a) Give half strength feed & reduce rate of feeding
- b) Boil the feed before administration.
- c) Switch over to parenteral nutrition.
- d) Give antibiotics cover.
- e) Give loperamide.

**EFY KEY 2026:** a) Give half strength feed and reduce rate of feeding. In this case, the best management would be to give a half-strength feed and reduce the rate of feeding to allow the patient's digestive system to adapt to the new diet.

**UHS-A12: For an extensive surgery next week, a 70-year-old woman is on parenteral nutritional support. Which is the essential step in monitoring to reduce the complication to the minimum?**

- a) Body weight recording.
- b) Daily intake tolerance/ threshold.
- c) Blood glucose estimation.
- d) Fluid intake output record.
- e) Full blood count and electrolyte estimation.

**EFY KEY 2026:** c) Blood glucose estimation. Hyperglycemia is a common complication of parenteral nutrition, and it can increase risk of infection, poor wound healing, and other complications. Therefore, monitoring blood glucose levels is essential.

**UHS-A12: A 30-year-old multiparous woman is being advised oral nutritional supplements. The duty doctor is recommending dilute solutions to be gradually concentrated to avoid which complication:**

- a) Abdominal cramps
- b) Aspiration of solutions
- c) Diarrhea (osmotic)
- d) Constipation
- e) Bloating, nausea, vomiting

**EFY KEY 2026:** c) Diarrhea (osmotic). This is the most common complication following enteral nutrition, as hyperosmolar foods cause transit time leading to diarrhea. Bloating, nausea, and vomiting are also mentioned in bailey as feed related complications but it is specifically related to osmolality.

**UHS-A13: A 25-year-old lady with high output enteric fistula has been undergoing total parenteral nutrition (TPN). She develops jaundice after three months. The liver enzymes are deranged. What is the next step?**

- a) Stop TPN
- b) Reduce the total calories
- c) Increase the carbohydrate intake
- d) Reduce fat content
- e) Add IV multivitamins

**EFY KEY 2026:** d) Reduce fat content. In a patient with a high output enteric fistula receiving TPN, developing jaundice after three months with deranged liver enzymes may be a sign of TPN-associated liver disease. The next step would be to reduce fat content in TPN.

**UHS-S13: A patient suffering from chronic esophageal obstruction needs hyperalimentation. Which out of the following would be most ideal way to build up nutritional level of this patient?**

- a) Total parenteral nutrition
- b) Percutaneous endoscopic gastrostomy (PEG)
- c) N/G tube feeding
- d) Feeding jejunostomy
- e) Fine needle catheter jejunostomy

**EFY KEY 2026:** d) Feeding jejunostomy. It would be the most ideal way to build up the nutritional level of a patient suffering from chronic esophageal obstruction who needs hyperalimentation. TPN is associated with higher risk of complications.

**UHS OPTIONLESS MULTIPLE CHOICE QUESTIONS**

**UHS-A15:** Side effect of total parenteral nutrition (TPN): Hypophosphatemia

**UHS-A15:** Complication of jejunostomy tube: Hyperglycemia

**UHS-A15:** Composition of total parenteral nutrition (TPN): Predominantly carbohydrates and fats

**UHS-A17:** Total parenteral nutrition (TPN): Increased protein content

**UHS-A17:** Every day measurement in TPN: Glucose

**UHS-A17:** 4-6 weeks' nutrition: PEG (percutaneous endoscopic gastrostomy) tube

**UHS-A17:** Composition of TPN: Fats + Glucose + Protein

**UHS-A19:** Management in case of sepsis by parenteral nutrition: Catheter tip culture & blood culture



**REFEEDING SYNDROME**

**RISK FACTORS**

A patient is at risk with  $\geq 1$  of the following:

- BMI  $< 16 \text{ kg/m}^2$
- Unintentional weight loss  $> 15\%$  in 3-6 months
- Little or no nutritional intake for  $> 10$  days
- Low K, phosphate, or Mg before feeding

Or  $\geq 2$  of the following:

- BMI  $< 18.5 \text{ kg/m}^2$
- Unintentional weight loss  $> 10\%$  in 3-6 months
- Little or no intake for more than 5 days
- Alcohol dependence
- Use of insulin, chemotherapy, antacids, or diuretics
- Death in severe cases

**CLINICAL FEATURES**

- Edema
- Muscle weakness
- Respiratory failure
- Seizures
- Lethargy
- Arrhythmias
- Cardiac failure
- Death in severe cases

**BIOCHEMICAL FINDINGS**

- Hypokalemia
- Hypocalcemia
- Lactic acidosis
- Hypophosphatemia
- Hypomagnesemia



- UHS-A19:** Reason for midnight feeding rest in patient of enteral nutrition: To avoid aspiration pneumonia
- UHS-A19:** Deficiency of which vitamin occurs in hemicolectomy: Vitamin K
- UHS-A20:** Nutritional therapy in case of total bowel obstruction: Total TPN
- UHS-S20:** Development of fatty acids deficiency in parenteral nutrition: After 4 weeks
- UHS-A21:** To avoid TPN related infection: Regularly exchange catheter
- UHS-A21:** High output enterocutaneous fistula: >500 ml **Low output: <200 ml**
- UHS-A21:** PEG tube: For 4-6 weeks' nutrition
- UHS-A22:** Complication of TPN with hyper-resonant note on right hemithorax: Pneumothorax
- UHS-A22:** Nutrition in case of duodenal fistula: TPN
- UHS-A23:** Route of nutrition in patient having history of corrosive intake who developed esophageal stricture: PEJ
- UHS-A23:** Complication of TPN: Hypocalcemia
- UHS-A24:** Preferred feeding method for maintaining gut integrity: Enteral nutrition
- UHS-A24:** Enteral feeding advantage: Maintains gut barrier function and prevents atrophy
- UHS-A25:** Cause of hypophosphatemia after initiation of total parenteral nutrition: Refeeding syndrome

### EFY CLINICAL CLINCHERS

|                                                                                        |                                                         |
|----------------------------------------------------------------------------------------|---------------------------------------------------------|
| Patient with a functional gastrointestinal tract but inadequate oral intake            | Enteral nutrition is preferred                          |
| Patient with massive small-bowel resection and severe malabsorption                    | Total parenteral nutrition                              |
| Feeding tube patient develops cough, hypoxia, and new chest infiltrates                | Aspiration pneumonia                                    |
| Enteral feeding patient develops abdominal distention and repeated vomiting with ileus | Enteral feeding intolerance                             |
| Central line patient on TPN develops fever and rigors during infusion                  | Catheter-related infection                              |
| Sudden breathlessness after subclavian central-line insertion                          | Pneumothorax                                            |
| Long-term TPN patient develops cholestatic liver-function abnormalities                | Intestinal failure-associated liver disease             |
| Severely malnourished patient develops weakness & arrhythmia after rapid feeding       | Refeeding syndrome                                      |
| Most characteristic electrolyte abnormality in refeeding syndrome                      | Hypophosphatemia                                        |
| Main advantage of enteral over parenteral feeding                                      | Preservation of gut mucosal integrity & ↓infection risk |



**Use the gut whenever it is functional:** enteral nutrition reduces infective complications and preserves intestinal integrity, whereas parenteral nutrition is reserved for patients who cannot adequately receive or absorb nutrients through the gastrointestinal tract.



NUTRITIONAL &amp; FLUID THERAPY | A PROJECT BY DR. ALI RAZA CHAUDARY



# Decoding MCQs' through EFY Lens

THE PRIME SHOTS | UHS MOST REPEATED MCQs 2026-27

1. Indicated for 4-6 weeks nutritional support: **PEG**
2. Composition of TPN: **CARBOHYDRATES > PROTEINS ± LIPIDS**
3. How to avoid catheter related infection: **BY REGULARLY CHANGING CATHETER** (Ix: **Culture of catheter tip and peripheral blood** to compare)
4. Best way to assess nutritional status in case of **acute** malnutrition: **SERUM ALBUMIN LEVELS** (Other best measures are **total lymphocyte count**, **serum transferrin**, **%weight loss** and **ideal body weight**)
5. Management in case of deranged LFTs following TPN: **REDUCE FAT CONTENT** (If still deranged, then **stop TPN temporarily**)
6. Management of complains of numbness around mouth and displays carpopedal spasm and a positive Chvostek sign: **INTRAVENOUS CALCIUM**
7. Management of hyperkalemia: **CALCIUM GLUCONATE**

## Let's Practice the HYFs

A PROJECT BY DR. ALI RAZA CHAUDARY

### CONCEPT CHECK QUESTION 1

A 68-year-old man with carcinoma of the esophagus is admitted for elective surgery. Over the last four months, he has experienced progressive dysphagia, significant weight loss, and generalized weakness. His BMI is 17 kg/m<sup>2</sup>, serum albumin is low, and physical examination reveals temporal muscle wasting and loss of subcutaneous fat. The surgical team is concerned about postoperative wound complications and infections. Which of the following is the most important consequence of preoperative malnutrition in surgical patients?

- |                                                                           |                                                      |
|---------------------------------------------------------------------------|------------------------------------------------------|
| (A) Reduced risk of postoperative infections                              | (B) Accelerated wound healing and collagen synthesis |
| (C) Increased postoperative morbidity, wound complications, and mortality | (D) Protection against postoperative catabolism      |
| (E) Reduced hospital stay and faster recovery                             |                                                      |

**The correct answer is C.** Malnutrition is a major predictor of poor surgical outcomes. Protein-energy malnutrition impairs immune function, collagen synthesis, angiogenesis, and wound healing, leading to increased rates of surgical site infection, wound dehiscence, prolonged hospitalization, and mortality. Identifying and correcting malnutrition before major surgery can significantly improve outcomes.

**Why other options are incorrect:** Option A is incorrect because infection risk increases. Option B is opposite to the actual effect of malnutrition. Option D is incorrect because malnourished patients are more susceptible to surgical stress and catabolism. Option E is incorrect because malnutrition generally prolongs recovery and hospital stay.

### CONCEPT CHECK QUESTION 2

A 72-year-old woman is being evaluated before major colorectal surgery. She reports an unintentional weight loss of 12% over the last six months. The surgeon wants an objective method to assess nutritional status and perioperative risk. Which of the following findings is considered a major indicator of significant nutritional risk?

- |                                                   |                                                                              |
|---------------------------------------------------|------------------------------------------------------------------------------|
| (A) Stable body weight with normal dietary intake | (B) Unintentional weight loss exceeding 10% of body weight within six months |
| (C) Normal BMI with no recent weight change       | (D) Normal muscle mass and grip strength                                     |
| (E) Normal serum electrolytes alone               |                                                                              |

**The correct answer is B.** One of the strongest indicators of clinically significant malnutrition is unintentional weight loss greater than 10% within six months. Nutritional assessment should include weight history, BMI, dietary intake, physical examination, muscle mass assessment, and validated screening tools. Weight loss is often more informative than a single laboratory value.

**Why other options are incorrect:** Option A suggests nutritional stability. Option C does not indicate malnutrition. Option D indicates preserved nutritional status. Option E is inadequate because normal electrolytes do not exclude severe malnutrition.

### CONCEPT CHECK QUESTION 3

A 60-year-old man undergoes major gastrointestinal surgery. Postoperatively, prolonged ileus develops and enteral feeding cannot be initiated for several days. The patient was severely malnourished preoperatively and has high metabolic demands. Which of the following is the most appropriate nutritional strategy?

- |                                                              |                                                                                   |
|--------------------------------------------------------------|-----------------------------------------------------------------------------------|
| (A) Continue starvation until bowel sounds return completely | (B) Provide total parenteral nutrition when enteral feeding is not feasible       |
| (C) Give only intravenous dextrose solution indefinitely     | (D) Avoid nutritional support because it increases infection risk in all patients |
| (E) Restrict protein intake to reduce metabolic demand       |                                                                                   |

**The correct answer is B.** Whenever possible, enteral nutrition is preferred because it maintains gut integrity and immune function. However, when the gastrointestinal tract cannot be used and prolonged nutritional deprivation is expected, total parenteral nutrition (TPN) is appropriate, especially in severely malnourished patients.

**Why other options are incorrect:** Option A worsens catabolism and nutritional deficiency. Option C does not provide adequate protein, fat, vitamins, or trace elements. Option D is incorrect because appropriate nutritional support improves outcomes. Option E worsens negative nitrogen balance and delays recovery.





## CONCEPT CHECK QUESTION 4

A 55-year-old man develops persistent vomiting due to pyloric obstruction from gastric carcinoma. Arterial blood gas analysis shows: pH 7.52,  $\text{HCO}_3^-$  36 mmol/L,  $\text{PaCO}_2$  48 mmHg. Serum potassium is low. Which of the following is the most likely acid-base disturbance?

- (A) Metabolic acidosis
- (B) Respiratory acidosis
- (C) Metabolic alkalosis with respiratory compensation
- (D) Respiratory alkalosis
- (E) Mixed metabolic acidosis and respiratory alkalosis

**The correct answer is C.** Persistent vomiting causes loss of hydrochloric acid from the stomach, leading to metabolic alkalosis. The elevated pH and bicarbonate confirm the metabolic process, while the elevated  $\text{PaCO}_2$  represents compensatory hypoventilation. Hypokalemia commonly accompanies this disorder.

**Why other options are incorrect:** Option A would show low bicarbonate and low pH. Option B would have elevated  $\text{PaCO}_2$  as the primary abnormality with low pH. Option D would have low  $\text{PaCO}_2$  and elevated pH. Option E is not supported by the ABG findings.

## CONCEPT CHECK QUESTION 5

A 70-year-old man undergoes major abdominal surgery. During the first postoperative day, he receives large volumes of isotonic crystalloid. On the second day, he develops peripheral edema, increasing body weight, and reduced oxygenation despite stable cardiac function. The surgical team suspects inappropriate perioperative fluid therapy. Which of the following best describes the goal of modern perioperative fluid management?

- (A) Administer maximum fluids to all surgical patients
- (B) Maintain euvolemia & adequate tissue perfusion while avoiding fluid overload
- (C) Restrict all fluids postoperatively regardless of clinical status
- (D) Use colloids exclusively in every patient
- (E) Replace all fluid losses with dextrose solutions only

**The correct answer is B.** Modern perioperative fluid management aims to maintain euvolemia, adequate organ perfusion, and oxygen delivery while avoiding both hypovolemia and fluid overload. Excessive fluid administration can lead to pulmonary edema, impaired wound healing, delayed gut recovery, and increased postoperative complications.

**Why other options are incorrect:** Option A increases complications from fluid overload. Option C risks hypoperfusion and acute kidney injury. Option D is not supported for routine use in all patients. Option E does not appropriately replace extracellular fluid losses and may worsen electrolyte disturbances.

# F

## PROBLEMS IN EARLY PREGNANCY

**EPISODE TEXTBOOKS © 2026-27 | GYNECOLOGY**

Dr. Ali Raza Chaudary, Dr. M. K. Chaudary



|                |                                            |            |
|----------------|--------------------------------------------|------------|
| <b>GYN-039</b> | Ectopic Pregnancy (EP)                     | <b>104</b> |
| <b>GYN-040</b> | Gestational Trophoblastic Disorders (GTDs) | <b>108</b> |
| <b>GYN-041</b> | Miscarriage                                | <b>112</b> |

### TO THE READER,

This book represents the consolidation of 10 years in the medical field helping medical students. You can be fully confident that you have, in one volume, **EVERYTHING** you need to do well in your **professional exams**.

A PROJECT BY

DR. ALI RAZA CHAUDARY



## PROBLEMS IN EARLY PREGNANCY | GYN-039

# Ectopic Pregnancy (EP)

## SPECIFIC LEARNING OUTCOMES 2026

- Describe the risk factors, common sites, and pathophysiology of ectopic pregnancy.
- Identify key clinical features.
- Differentiate ectopic pregnancy from other causes of early pregnancy bleeding and acute abdomino-pelvic pain.
- Interpret essential investigations: urine/serum  $\beta$ -hCG, transvaginal ultrasound findings, and discriminatory zone concepts.
- Outline management options: expectant, medical, and surgical approaches.
- Describe the complications of ectopic pregnancy.
- Explain counseling points regarding fertility impact, recurrence risk, and follow-up with serial  $\beta$ -hCG.



### RISK FACTORS FOR ECTOPIC PREGNANCY

- Previous ectopic pregnancy
- PID
- Chlamydia / gonorrhea
- Previous tubal surgery
- Tubal sterilization failure
- IUCD failure
- Endometriosis
- Infertility/subfertility
- IVF/ART
- Smoking
- Increased maternal age
- Previous abdominal surgery

**Ectopic pregnancy (EP)** is implantation of a fertilized ovum **outside the uterine cavity**. More than **95–98%** occur in the **fallopian tube**. A **heterotopic pregnancy** means simultaneous intrauterine and ectopic pregnancy.

### COMMON SITES

- Fallopian tube** – most common site (**Ampullary** > Isthmic, Fimbrial, Interstitial i.e. cornual)
- Ovary
- Cervix
- Abdominal cavity (only ectopic site where fetus may rarely continue to grow)
- Caesarean scar

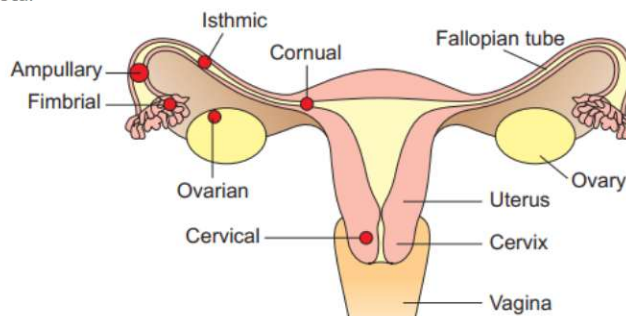


Fig. 39.1: Common sites of EP

### DIAGNOSTIC CLUE (BY EFY)

#### ■ ECTOPIC PREGNANCY

- Classical triad:** Only about 1/2 of patients present with all three, so maintain high suspicion  
**Amenorrhea** 6–8 weeks + **Abdominal or pelvic pain** + **Vaginal bleeding** (brown spotting)
- Unilateral iliac fossa pain (if tubal site)
- GI or urinary Sx

#### ■ RUPTURED ECTOPIC PREGNANCY

- Hypovolemic shock** (hypotension & tachycardia)
- Dizziness & syncope (if intra-abdominal bleeding)
- Shoulder tip pain (if diaphragmatic irritation by blood)
- Urge to defecate or rectal pressure (if blood in pouch of Douglas)
- Tenderness, guarding & rebound tenderness on abdomen palpation

### INVESTIGATIONS

- Urine pregnancy test**
- Serum  $\beta$ -hCG** (for diagnosis & follow-up)
- TVUSS** (to locate pregnancy)
- CBC (Hb): Low**
- Blood group & Rh status** (for anti-D decision)
- Group, save & crossmatch** (if unstable or surgery likely)
- LFTs, RFTs, CBC** (before starting methotrexate)
- STI screen**

#### ■ BETA-HCG INTERPRETATION

| $\beta$ -hCG Pattern               | Interpretation                                       |
|------------------------------------|------------------------------------------------------|
| $\geq 35$ to 63% in first 48 hours | <b>Normal intrauterine pregnancy (IUP)</b>           |
| Suboptimal rise                    | EP or Failing IUP                                    |
| Plateau                            | Abnormal pregnancy; EP must be excluded              |
| Falling $\beta$ -hCG               | Resolving EP or Miscarriage                          |
| Persistent low rise or fall        | Pregnancy of unknown location (PUL) follow-up needed |

#### ■ TRANSVAGINAL ULTRASOUND FINDINGS

| $\beta$ -hCG Pattern                    | Interpretation                           |
|-----------------------------------------|------------------------------------------|
| Intrauterine gestational sac + yolk sac | Excludes EP except heterotopic pregnancy |
| Empty uterus + Adnexal mass             | Highly suggestive of EP                  |
| Tubal ring                              | Tubal EP                                 |
| Adnexal gestational sac with yolk sac   | Diagnostic of EP                         |
| Cardiac activity in adnexal mass        | 100% specific for EP                     |
| Echogenic free fluid                    | Suggests bleeding or rupture EP          |

## Pathogenesis

### PATHOPHYSIOLOGY OF ECTOPIC PREGNANCY

Tubal damage or impaired tubal transport  $\rightarrow$  Delayed movement of blastocyst  $\rightarrow$  Implantation in tube/extrauterine site  $\rightarrow$  Trophoblastic invasion  $\rightarrow$  Erosion of vessels  $\rightarrow$  Bleeding into tube/peritoneum  $\rightarrow$  Tubal miscarriage or rupture

#### Tubal Changes

- Minimal decidual reaction in tube
- Increased vascularity
- Chorionic villi invade tubal wall
- Tube distends and thins
- Rupture (Hemoperitoneum & shock)

#### Uterine changes

- Uterus may enlarge slightly
- Endometrium becomes decidualized
- No chorionic villi are present in uterine cavity
- Pseudosac may appear
- Decidual cast may be passed and mistaken for miscarriage

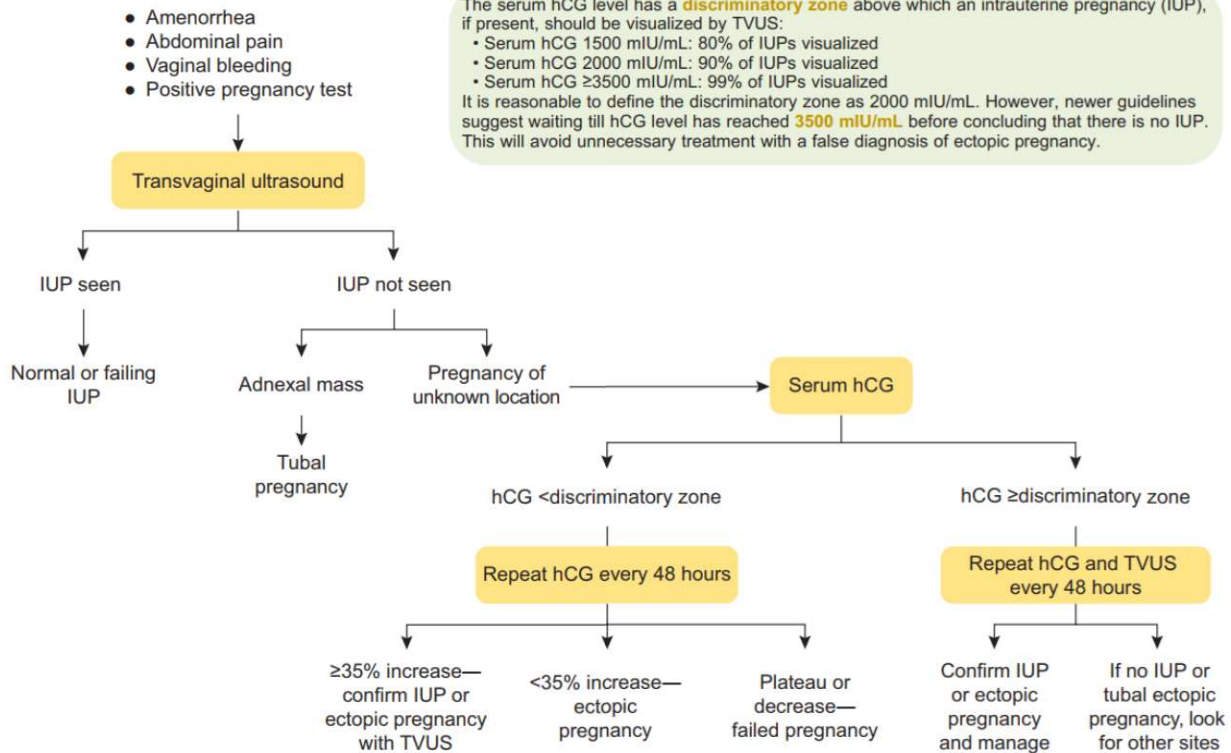


Fig. 39.2: Diagnostic pathway for EP

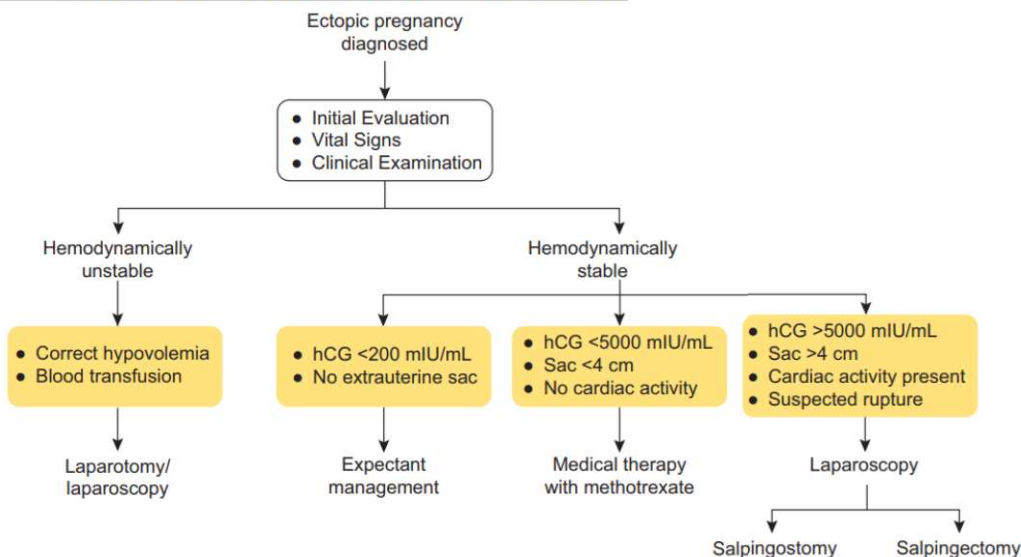
**MANAGEMENT****■ CRITERIA FOR SELECTION OF SPECIFIC MANAGEMENT**

Fig. 39.3: Management pathway for EP

| Parameter                                 | Expectant Management   | Methotrexate Management | Surgical Management |
|-------------------------------------------|------------------------|-------------------------|---------------------|
| Hemodynamic condition                     | Stable                 | Stable                  | Unstable            |
| Serum hCG level (mIU/mL)                  | <200 (or <1000)        | ≤5000                   | >5000               |
| Fetal cardiac activity                    | Absent                 | Absent                  | Present             |
| Size of ectopic mass (cm)                 | <3.5 or not visualized | <3.5-4                  | >3.5-4              |
| Signs & symptoms of impending rupture     | Absent                 | Absent                  | Present             |
| Hematological, renal, or hepatic disorder | None                   | None                    | Present             |
| Compliance and follow-up                  | Good                   | Good                    | Poor                |
| Heterotopic pregnancy                     | Not present            | Not present             | Present             |

**DIFFERENTIALS OF ECTOPIC PREGNANCY & PELVIC PAIN**

- Threatened miscarriage
- Incomplete miscarriage
- Ruptured corpus luteum cyst
- Ovarian torsion
- PID
- Appendicitis
- UTI or renal colic
- Endometriosis
- Degenerating fibroid

**PREGNANCY OF UNKNOWN LOCATION (PUL)**

It means:

- Positive pregnancy test +
- No intrauterine pregnancy +
- No definite EP on TVUSS

It is a **working diagnosis**, not a final diagnosis. EP is not excluded.**Management of PUL**

- Serial β-hCG every 48 hours
- Repeat TVUSS
- Continue follow-up until:
  - IUP identified, or
  - EP identified, or
  - β-hCG becomes negative







## Applied

## DRUG MANUAL

### METHOTREXATE (MTX)

#### CONTRAINDICATION

- Hemodynamic instability
- Suspected rupture
- Breastfeeding
- Liver disease
- Renal disease
- Hematological disorder
- Active infection
- Immunodeficiency
- Inability to attend follow-up

#### ADVICE AFTER METHOTREXATE

- Avoid pregnancy **for 3 months**
- Avoid alcohol
- Avoid folic acid supplements
- Avoid NSAIDs
- Avoid sexual intercourse during treatment
- Avoid excessive sunlight
- Return urgently if severe pain, fainting or shoulder tip pain occurs

### EMERGENCY MANAGEMENT OF UNSTABLE EP

- ABC assessment
- Two large-bore IV lines
- IV fluids and blood products as needed
- CBC, blood group, crossmatch
- Urgent gynecology or surgical call
- Laparoscopy or laparotomy
- Anti-D (if Rh-negative and indicated)

### EXPECTANT MANAGEMENT

- **Serial  $\beta$ -hCG** until undetectable
- Return urgently if pain, dizziness, syncope, shoulder pain or heavy bleeding occurs

### MEDICAL MANAGEMENT

- **Methotrexate 50 mg/m<sup>2</sup> IM**
- **Check  $\beta$ -hCG (day 4 & day 7):**
  - Adequate fall:**  $\beta$ -hCG fall >15% between day 4 & day 7 → Follow-up with weekly  $\beta$ -hCG until undetectable
  - Inadequate fall** → Repeat dose or surgery

### SURGICAL MANAGEMENT

- **Laparoscopy:** Preferred if stable and expertise available
- **Laparotomy:** **Unstable** patient, massive bleeding, difficult laparoscopy
- **Salpingectomy:** Removal of affected tube; **preferred if other tube normal**
- **Salpingostomy or salpingotomy:** Tube-conserving; **considered if opposite tube damaged/absent**

### COMPLICATIONS

| Acute Complications                                                                                                                                                                                                      | Long-Term Complications                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Tubal rupture</li> <li>• Hemoperitoneum</li> <li>• Hypovolemic shock</li> <li>• Maternal death</li> <li>• Need for blood transfusion</li> <li>• Emergency laparotomy</li> </ul> | <ul style="list-style-type: none"> <li>• Reduced fertility</li> <li>• Recurrent ectopic pregnancy</li> <li>• Tubal damage/adhesions</li> <li>• Psychological distress</li> <li>• Anxiety/depression</li> <li>• Future pregnancy fear</li> </ul> |

### UHS 5-OPTIONED MULTIPLE CHOICE QUESTIONS

**UHS-M07:** A 23-year-old primigravida presents with abdominal pain, syncope, vaginal spotting. Assessment reveals that she has an ectopic pregnancy. The most common site of ectopic pregnancy is:

- Ampulla
- Isthmus
- Fimbriae
- Abdomen
- Cervix

**EFY KEY 2026:** a) Ampulla. Ectopic pregnancy occurs when the fertilized egg implants outside the uterus, and the most common site of ectopic pregnancy is the ampulla of the fallopian tube, which is the widest and longest part of the tube.

**UHS-A13:** A 35-year-old G2P1 comes to OPD with amenorrhea of 7 weeks and bleeding per vaginam. On USG, she is diagnosed to have left sided un-ruptured ectopic pregnancy. You decide medical treatment with methotrexate as

- It is a folic acid agonist and interferes with DNA synthesis
- Commonly given as multiple injections
- Recurrence of ectopic pregnancy is minimum with its use
- Success rate is 80%
- Indicated in cornual pregnancy

**EFY KEY 2026:** e) Indicated in cornual pregnancy. It is a rare form of ectopic pregnancy that occurs in the proximal part of the fallopian tube, near the uterine cornua. Methotrexate folic acid antagonist, not an agonist. However, recurrence of ectopic pregnancy is not necessarily minimum with its use. Methotrexate is given as single or multiple injections to achieve a successful outcome. The success rate of may be lower in cases of advanced gestational age or high beta-hCG levels.

**UHS-S13:** A 28-year-old P2+0 brought to emergency with history of 8-week amenorrhea, however abdominal plain USG revealed empty uterus with serum HCG value 1600 m/U. What is most probable diagnosis?

- Ectopic pregnancy
- Twisted ovarian cyst
- Ruptured corpus luteum cyst
- Inevitable miscarriage
- PID

**EFY KEY 2026:** a) Ectopic pregnancy. In an ectopic pregnancy, the fertilized egg implants outside the uterus, usually in the fallopian tube. The serum beta-hCG level may be low, and ultrasound may reveal an empty uterus with no gestational sac. Ectopic pregnancy is a medical emergency that requires prompt diagnosis and management.



### COUNSELING FOR ECTOPIC PREGNANCY

- Explain that ectopic pregnancy is **not viable** and can be **life-threatening**.
- **Future fertility is often preserved**, especially if the opposite tube is healthy.
- Recurrence risk after one EP is about **8-18%**; some texts cite around **10%**.
- **Early scan is needed** in the next pregnancy.
- After methotrexate, **avoid conception for 3 months**.
- **Serial  $\beta$ -hCG** follow-up is essential until negative.
- **Return immediately** for worsening pain, fainting, shoulder tip pain or heavy bleeding.
- **Provide emotional support** and bereavement counseling.
- **Give contraception advice** if pregnancy is not desired immediately.
- Rh-negative patients may need **anti-D** depending on management protocol.



**UHS OPTIONLESS MULTIPLE CHOICE QUESTIONS****UHS-A15:** Treatment of ruptured ectopic pregnancy: Salpingectomy of affected tube**UHS-A17:** Treatment of ruptured ectopic pregnancy with  $\beta$ -hCG 10500 IU/l: Laparotomy + Salpingectomy**UHS-A19:** Drug of choice for ectopic pregnancy: Methotrexate**UHS-A20:** Best treatment for right-sided ruptured ectopic pregnancy: Laparotomy with salpingectomy**UHS-A21:** Main sign of ruptured EP with intra peritoneal hemorrhage: Shoulder tip pain on inspiration**UHS-A22:** 6-week amenorrhea and empty uterus: Ectopic pregnancy**UHS-A23:** Management of ruptured ectopic pregnancy: Laparotomy**UHS-A24:** Main investigation in pregnancy of unknown location: Serial  $\beta$ -hCG**EFY CLINICAL CLINCHERS**

|                                                            |                                             |
|------------------------------------------------------------|---------------------------------------------|
| 7-week amenorrhea with unilateral pelvic pain and spotting | Ectopic pregnancy                           |
| Early pregnancy with abdominal pain and fainting           | Ruptured ectopic until proven otherwise     |
| Shoulder tip pain in early pregnancy                       | Hemoperitoneum from ruptured ectopic        |
| Urge to defecate with pelvic pain in pregnancy             | Blood in pouch of Douglas                   |
| Positive pregnancy test with empty uterus on TVUS          | Pregnancy of unknown location / possible EP |
| Empty uterus with adnexal mass                             | Tubal ectopic pregnancy                     |
| Adnexal sac with yolk sac                                  | Definite ectopic pregnancy                  |
| Fetal cardiac activity in adnexal mass                     | Diagnostic ectopic pregnancy                |
| Echogenic free fluid in pouch of Douglas                   | Bleeding ectopic pregnancy                  |
| Ring of fire around adnexal mass                           | Suggestive but not specific for EP          |
| $\beta$ -hCG >3500 with no IUP                             | Ectopic highly suspected                    |
| $\beta$ -hCG rises slowly over 48 hours                    | Ectopic or failing pregnancy                |
| Stable patient, hCG low and falling                        | Expectant management                        |
| Stable EP, mass <35 mm, hCG <5000, no heartbeat            | Methotrexate candidate                      |
| EP with hCG >5000 or fetal cardiac activity                | Surgical management preferred               |
| EP with shock and guarding                                 | Resuscitation + urgent surgery              |
| Methotrexate day 4 to day 7 hCG fall <15%                  | Repeat dose or further treatment            |
| Previous ectopic pregnancy                                 | High recurrence risk in future pregnancy    |
| IVF pregnancy with IUP but persistent pain                 | Consider heterotopic pregnancy              |



Any reproductive-age woman with abdominal pain or bleeding needs **pregnancy testing**; ectopic pregnancy is diagnosed by TVUS plus serial  $\beta$ -hCG, and management depends on stability,  $\beta$ -hCG level, mass size and fetal cardiac activity.







# Decoding MCQs' through EFY Lens

THE PRIME SHOTS | UHS MOST REPEATED MCQs 2026-27

1. Retained products of conception + Vaginal bleeding + Abdominal pain: **INCOMPLETE MISCARRIAGE**
2. DOC for ectopic pregnancy: **METHOTREXATE** (MC site of EP is **ampulla of fallopian tube**)
3. TOC for ruptured ectopic pregnancy (hypovolemic shock, intraperitoneal fluid, **shoulder tip pain on inspiration**): **LAPAROTOMY + SALPINGECTOMY**  
**If contralateral fallopian tube is absent, go for salpingostomy**
4. MCC of recurrent miscarriages: **ANTIPHOSPHOLIPID SYNDROME** also known as lupus anticoagulant syndrome
5. DOC for miscarriage in case of <9 weeks: **MISOPROSTOL**

## Let's Practice the HYFs

A PROJECT BY DR. ALI RAZA CHAUDARY

### CONCEPT CHECK QUESTION 1

A 28-year-old woman presents to the emergency department with 7 weeks of amenorrhea, lower abdominal pain, and light vaginal bleeding. She feels dizzy on standing. Her urine pregnancy test is positive. On examination, pulse is 116/min, blood pressure is 90/60 mmHg, and there is marked right iliac fossa tenderness with cervical motion tenderness. Transvaginal ultrasound shows an empty uterus with free fluid in the pouch of Douglas. Which of the following is the most appropriate immediate management?

- |                                                                  |                                                                  |
|------------------------------------------------------------------|------------------------------------------------------------------|
| (A) Oral misoprostol and discharge                               | (B) Expectant management with repeat $\beta$ -hCG after 48 hours |
| (C) Emergency surgical management for ruptured ectopic pregnancy | (D) Methotrexate therapy as outpatient                           |
| (E) Reassurance and routine antenatal follow-up                  |                                                                  |

**The correct answer is C.** This woman has a ruptured ectopic pregnancy suggested by amenorrhea, positive pregnancy test, abdominal pain, vaginal bleeding, hemodynamic instability, empty uterus, and free intraperitoneal fluid. This is a gynecological emergency requiring resuscitation and urgent surgical management, usually laparoscopy or laparotomy depending on stability and resources.

**Why other options are incorrect:** Option A is used in selected miscarriage management, not ruptured ectopic pregnancy. Option B is only suitable for carefully selected stable patients with low and falling  $\beta$ -hCG. Option D can be used for selected unruptured ectopic pregnancies in stable patients, but it is contraindicated in hemodynamic instability. Option E is unsafe because the patient has signs of intra-abdominal bleeding.

### CONCEPT CHECK QUESTION 2

A 25-year-old woman presents with 6 weeks of amenorrhea and mild lower abdominal pain. Urine pregnancy test is positive. She is hemodynamically stable. Transvaginal ultrasound shows no intrauterine gestational sac and no adnexal mass. Serum  $\beta$ -hCG is 1200 IU/L. Forty-eight hours later,  $\beta$ -hCG rises only slightly to 1450 IU/L. Which of the following is the most appropriate interpretation?

- |                                                              |                                                             |
|--------------------------------------------------------------|-------------------------------------------------------------|
| (A) Normal viable intrauterine pregnancy                     | (B) Pregnancy of unknown location requiring close follow-up |
| (C) Complete miscarriage confirmed with no further follow-up | (D) Hydatidiform mole                                       |
| (E) Menstrual irregularity without pregnancy                 |                                                             |

**The correct answer is B.** This is best classified as pregnancy of unknown location because the pregnancy test is positive but ultrasound has not localized the pregnancy. The  $\beta$ -hCG rise is suboptimal for a normal early intrauterine pregnancy, so ectopic pregnancy remains a significant concern. Close follow-up with serial  $\beta$ -hCG and repeat ultrasound is essential until the location and outcome are confirmed.

**Why other options are incorrect:** Option A is unlikely because a viable intrauterine pregnancy usually shows an appropriate rise in  $\beta$ -hCG early in gestation. Option C cannot be confirmed without evidence of complete resolution and falling  $\beta$ -hCG. Option D usually presents with markedly raised  $\beta$ -hCG, enlarged uterus, and characteristic ultrasound findings. Option E is impossible because the pregnancy test is positive.

### CONCEPT CHECK QUESTION 3

A 19-year-old woman presents with excessive vomiting, vaginal bleeding, and amenorrhea for 12 weeks. On examination, her uterus is larger than expected for gestational age, and no fetal heart sounds are detected. Serum  $\beta$ -hCG is markedly elevated. Ultrasound shows a diffuse echogenic intrauterine mass with multiple cystic spaces and no fetus. Which of the following is the most likely diagnosis?

- |                            |                                |
|----------------------------|--------------------------------|
| (A) Threatened miscarriage | (B) Complete hydatidiform mole |
| (C) Ectopic pregnancy      | (D) Missed miscarriage         |
| (E) Placenta previa        |                                |

**The correct answer is B.** This presentation is classical for complete hydatidiform mole, a type of gestational trophoblastic disease. Key clues include excessive vomiting, vaginal bleeding, uterus larger than dates, very high  $\beta$ -hCG, absent fetal parts, and the typical "snowstorm" or multicystic ultrasound appearance. Complete moles have a higher risk of persistent gestational trophoblastic neoplasia compared with partial moles.

**Why other options are incorrect:** Option A presents with bleeding but a closed cervix and viable intrauterine pregnancy. Option C usually shows an empty uterus with adnexal findings rather than a multicystic intrauterine mass. Option D involves fetal demise retained in uterus but does not usually cause markedly elevated  $\beta$ -hCG or snowstorm appearance. Option E causes painless bleeding in later pregnancy and is not diagnosed by these early molar features.





## CONCEPT CHECK QUESTION 4

A woman undergoes suction evacuation for a molar pregnancy. She is clinically stable and asks what follow-up is needed. The clinician explains that careful surveillance is essential because persistent trophoblastic disease can develop even after uterine evacuation. Which of the following is the most important follow-up test?

- (A) Serial serum  $\beta$ -hCG monitoring
- (B) Monthly serum calcium
- (C) Repeated Pap smear every week
- (D) Daily urine routine examination
- (E) Serial fasting blood glucose only

**The correct answer is A.** After evacuation of a molar pregnancy, serial  $\beta$ -hCG monitoring is essential to confirm complete resolution and detect persistent gestational trophoblastic neoplasia early. A plateauing or rising  $\beta$ -hCG after evacuation suggests persistent disease and requires further evaluation and treatment. Effective contraception is advised during surveillance so that pregnancy does not confuse  $\beta$ -hCG interpretation.

**Why other options are incorrect:** Option B has no role in GTD follow-up. Option C is for cervical screening and does not monitor trophoblastic tissue. Option D is nonspecific and cannot detect persistent GTD. Option E is unrelated to molar disease surveillance.

## CONCEPT CHECK QUESTION 5

A 10-week pregnant woman presents with vaginal bleeding and crampy lower abdominal pain. On examination, the cervical os is open and products of conception are seen protruding through the cervix. Ultrasound shows retained products within the uterus. She is hemodynamically stable. Which of the following is the most likely type of miscarriage?

- (A) Threatened miscarriage
- (B) Inevitable miscarriage
- (C) Incomplete miscarriage
- (D) Complete miscarriage
- (E) Missed miscarriage

**The correct answer is C.** This is incomplete miscarriage because the cervical os is open and some products of conception have been expelled or are protruding, while ultrasound still shows retained products in the uterus. Crampy abdominal pain and bleeding are typical. Management depends on stability, gestational age, bleeding severity, infection risk, and patient preference, and may include expectant, medical, or surgical management.

**Why other options are incorrect:** Option A has vaginal bleeding with a closed cervical os and viable pregnancy. Option B has bleeding and an open os but products have not yet been expelled. Option D means all products have been expelled and the uterus is empty. Option E is fetal demise retained in the uterus, usually with closed os and absent symptoms or minimal bleeding.





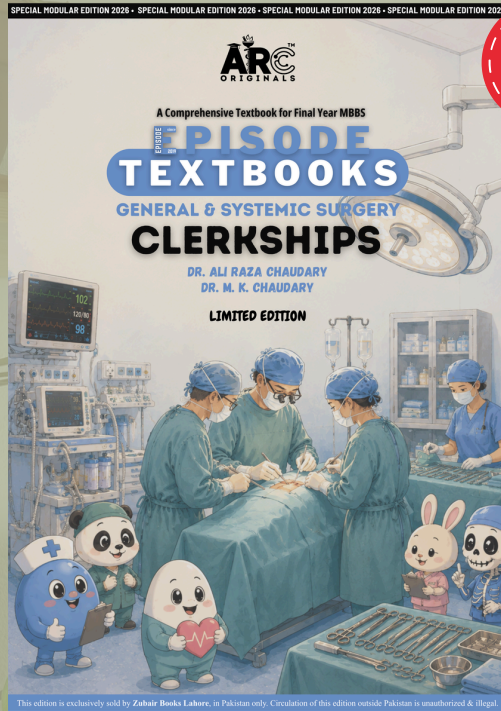
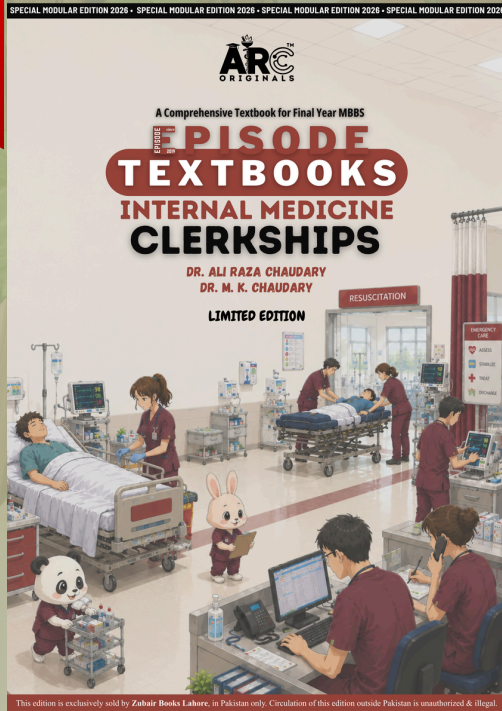
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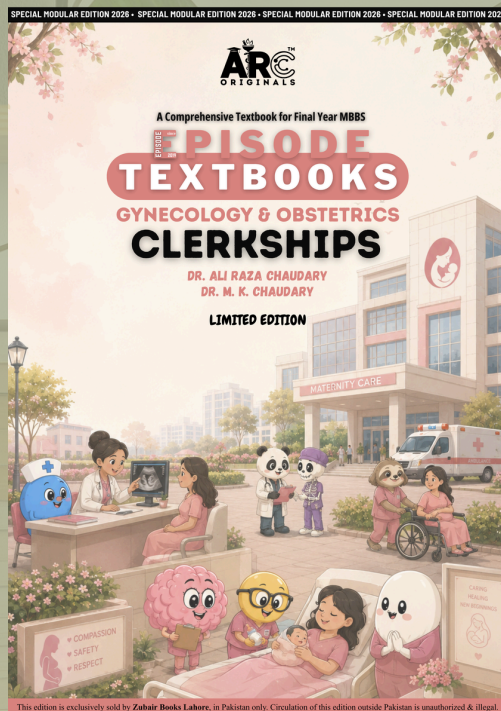
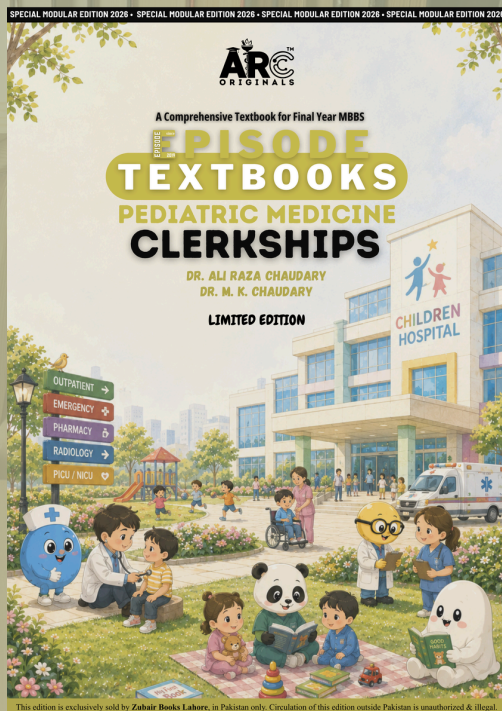
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