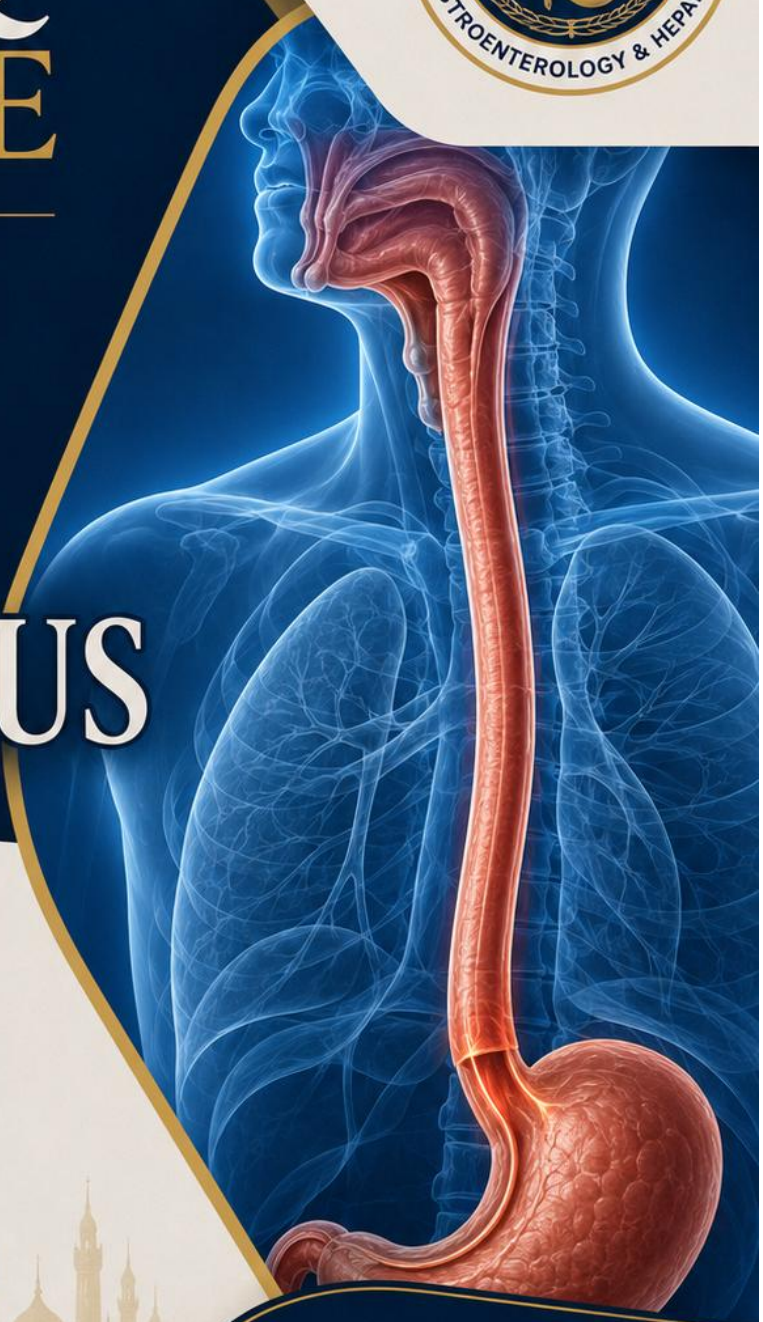
MCQ SOURCE

FOR THE

EGYPTIAN BOARD OF GASTROENTEROLOGY AND HEPATOLOGY

CHAPTER 1

ESOPHAGUS



- Anatomy & Physiology
- GERD • Barrett's • Motility
- Strictures • Varices • Cancer

Prepared by Dr. Omar Reda
GE and Hepatology Consultant

KNOWLEDGE TODAY
EXCELLENCE TOMORROW

Dedication

In loving memory of my mother,

who recently returned to the mercy of Allah.

Her love, prayers, patience, and sacrifices were among the greatest blessings of my life. Whatever good I achieve carries something of her guidance and support.

May Allah forgive her, have mercy upon her, illuminate her grave, and grant her the highest place in **Jannat al-Firdaws**.

This work is dedicated to her memory.

أسأل الله أن يرحم أمي رحمة واسعه وأن يدخلها الفردوس الأعلى من الجنة، ورجاءً أسألكم لها خالص الدعاء..

Chapter 2: Stomach
Mechanism-Based Gastroenterology MCQs

50 original consultant-level questions | Correct answers randomized | Key mechanisms highlighted

Source basis: uploaded stomach/GI references covering **gastroparesis**, **functional dyspepsia**, **H. pylori**, **Zollinger-Ellison syndrome**, **gastric polyps**, **gastric intestinal metaplasia**, **gastric adenocarcinoma**, **MALT lymphoma**, **gastric NETs**, and **GIST**. Questions are original and mechanism-based.

Blue bold = key mechanism/drug/biomarker	Green answer = correct option	Orange mechanism = explanation focus

1. Diabetic gastroparesis and dopamine pharmacology

A 57-year-old woman with long-standing diabetes, early satiety, postprandial vomiting, and delayed 4-hour gastric emptying is started on metoclopramide. Three weeks later her nausea and meal tolerance improve.

Which mechanism best explains the prokinetic benefit?

A. Motilin receptor agonism causing strong migrating motor complex activation
B. **D2 receptor antagonism** enhancing cholinergic gastric motor activity and providing antiemetic effect
C. 5-HT3 receptor blockade at the area postrema with no effect on gastric emptying
D. Muscarinic M3 blockade reducing pyloric tone

Answer: B

Mechanism: **Metoclopramide** is a dopamine **D2 antagonist** with prokinetic and antiemetic activity. Dopamine normally inhibits upper-GI cholinergic motor pathways; blocking this signal can improve gastric emptying.

2. Erythromycin tachyphylaxis in gastroparesis

A hospitalized man with severe diabetic gastroparesis improves dramatically after IV erythromycin, but the response fades after repeated dosing over the next 10 days.

Which mechanism best explains this loss of effect?

A. Irreversible destruction of antral smooth muscle by macrolide exposure
B. Development of neutralizing anti-erythromycin antibodies against gastric mucosa
C. Progressive inhibition of dopamine receptors in the chemoreceptor trigger zone
D. **Motilin receptor** saturation and downregulation after repeated stimulation

Answer: D

Mechanism: Erythromycin acts as a **motilin receptor agonist** and stimulates antral contractions. Its clinical benefit is often short-lived because receptor tolerance/tachyphylaxis develops.

3. Domperidone versus metoclopramide

A patient with gastroparesis developed dystonia on metoclopramide. Domperidone is considered through a regulated access pathway, and ECG monitoring is arranged.

Which pharmacologic explanation is most accurate?

A. Domperidone is a central D2 agonist with high extrapyramidal toxicity
B. Domperidone is a motilin receptor agonist with no cardiac effect
C. **Peripheral D2 antagonism** improves motility with fewer CNS effects, but **QT prolongation** remains a concern
D. Domperidone irreversibly inhibits the H+/K+-ATPase pump

Answer: C

Mechanism: **Domperidone** is a peripheral dopamine antagonist and crosses the blood-brain barrier poorly, so neurologic effects are less than with metoclopramide. It can still prolong the **QT interval**.

4. Hyperglycemia and gastric emptying

A diabetic patient undergoes gastric emptying scintigraphy during marked hyperglycemia. The result shows delayed emptying, but symptoms improve after better glycemic control.

Which mechanism best explains why glycemia matters during assessment?

A. **Acute hyperglycemia delays gastric emptying** and can exaggerate gastroparesis physiology
B. Hyperglycemia accelerates pyloric relaxation and falsely normalizes emptying
C. Hyperglycemia selectively increases gastric acid secretion but not motility
D. Hyperglycemia directly suppresses serum gastrin and causes achlorhydria

Answer: A

Mechanism: In diabetic gastroparesis, motor testing should be interpreted with glycemia in mind because **hyperglycemia itself slows gastric emptying**.

5. Dietary therapy in gastroparesis

A woman with moderate gastroparesis asks why she is advised to take small-particle, low-fat, low-fiber meals rather than large high-fat meals.

Which mechanism best supports this advice?

A. Dietary fat directly inhibits dopamine D2 receptors
B. Fiber accelerates emptying by dissolving bezoars
C. **Fat and indigestible fiber delay gastric emptying** and worsen retention in impaired gastric motor function
D. High-fat meals increase motilin receptor sensitivity and prevent tachyphylaxis

Answer: C

Mechanism: Dietary management targets the motor defect: **small frequent meals**, low fat, low fiber, and liquid/small-particle foods reduce gastric retention.

6. Functional dyspepsia and impaired accommodation

A 33-year-old woman has early satiety and postprandial fullness. Endoscopy and labs are normal. A trial of buspirone is considered.

Which mechanism provides the best rationale?

A. Direct irreversible inhibition of gastric proton pumps
B. Motilin receptor downregulation to reduce antral contractions
C. D2 blockade in the chemoreceptor trigger zone only
D. Improvement of **fundic accommodation** through serotonergic/vagal pathways

Answer: D

Mechanism: A subgroup of **functional dyspepsia** has impaired meal-induced gastric accommodation. Buspirone may improve symptoms by enhancing fundic relaxation/accommodation.

7. Functional dyspepsia and visceral hypersensitivity

A 29-year-old woman has severe epigastric discomfort after normal-volume meals. Gastric emptying and endoscopy are normal. Balloon distension reproduces pain at low volumes.

Which mechanism best explains her symptoms?

A. Unopposed gastrin secretion from antral D-cell loss
B. **Visceral hypersensitivity** to mechanical/nutrient stimulation with altered central processing
C. Transmural granulomatous inflammation of the stomach
D. Complete parietal-cell destruction causing pernicious anemia

Answer: B

Mechanism: Functional dyspepsia can arise from **visceral hypersensitivity**, impaired accommodation, modest delay in emptying, diet-related triggers, and brain-gut interaction rather than structural disease.

8. PPI benefit in functional dyspepsia subtype

Two patients have functional dyspepsia. One has epigastric burning/pain; the other has mainly nausea and bloating with postprandial fullness. A PPI trial is planned.

Which patient is more mechanistically likely to benefit from acid suppression?

A. The patient with **epigastric pain/burning or reflux-like symptoms**
B. The patient with pure postprandial nausea due to accommodation failure
C. The patient with delayed emptying caused by opioid therapy
D. The patient with rumination syndrome

Answer: A

Mechanism: PPI response in **functional dyspepsia** is modest and more likely in epigastric pain/reflux-like phenotypes than in dysmotility-predominant symptoms.

9. Rumination syndrome

A 21-year-old woman has effortless regurgitation of recently ingested food within minutes of meals. There is no nausea, retching, nocturnal vomiting, weight loss, or delayed gastric emptying.

Which mechanism best explains the disorder?

A. Motilin receptor deficiency causing severe gastric retention
B. Autoimmune parietal-cell destruction causing achlorhydria
C. A learned behavioral pattern with **postprandial abdominal wall contraction** and retrograde flow
D. IgE-mediated pyloric edema after meals

Answer: C

Mechanism: **Rumination syndrome** is effortless postprandial regurgitation, usually behavioral/learned, and differs from vomiting and gastroparesis.

10. Cyclic vomiting syndrome and brain-gut biology

A 27-year-old man has stereotyped episodes of severe vomiting lasting 24-48 hours, with complete wellness between attacks and personal history of migraine.

Which mechanism-based interpretation is most appropriate?

A. Continuous gastric outlet obstruction with persistent retention between attacks
B. H. pylori-driven hypergastrinemia causing episodic acid crisis
C. Gastric adenocarcinoma presenting with intermittent vagal discharge
D. A **brain-gut disorder** with migraine/autonomic associations producing stereotyped vomiting episodes

Answer: D

Mechanism: **Cyclic vomiting syndrome** is episodic and stereotyped, often linked to migraine biology and autonomic/brain-gut dysregulation rather than fixed obstruction.

11. H. pylori survival in acid

A patient with chronic active gastritis asks how H. pylori survives in a highly acidic stomach.

Which bacterial mechanism is most important?

A. **Urease** hydrolyzes urea to ammonia, buffering the local peribacterial environment
B. The organism permanently inhibits parietal-cell proton pumps
C. The organism produces intrinsic factor to neutralize acid
D. The organism converts bile acids into bicarbonate

Answer: A

Mechanism: **H. pylori urease** generates ammonia and permits survival close to the gastric epithelial surface.

12. Antral H. pylori and duodenal ulcer

A 36-year-old man has recurrent duodenal ulcers. Biopsies show antral-predominant H. pylori gastritis with preserved corpus mucosa.

Which mechanism best explains ulcer formation?

A. Pangastritis causing achlorhydria and bacterial overgrowth
B. Reduced antral **D-cell somatostatin**, unopposed **gastrin**, increased parietal-cell mass, and acid delivery to the duodenum
C. Autoimmune destruction of intrinsic factor-secreting cells
D. CDH1 mutation causing signet-ring carcinoma

Answer: B

Mechanism: Antral-predominant H. pylori lowers **somatostatin**, increases **gastrin**, and increases acid output, predisposing to duodenal ulceration.

13. Corpus-predominant H. pylori and cancer pathway

A 63-year-old man from a high-risk region has long-standing H. pylori infection, multifocal atrophic gastritis, hypochlorhydria, and intestinal metaplasia.

Which carcinogenic pathway is most relevant?

A. D-cell loss causing isolated duodenal acid injury without gastric atrophy
B. Gastrin receptor mutation causing immediate ECL carcinoma
C. A learned abdominal wall contraction causing mucosal prolapse
D. Chronic inflammation progressing through **atrophy - intestinal metaplasia - dysplasia - adenocarcinoma**

Answer: D

Mechanism: The **Correa cascade** links chronic H. pylori inflammation to atrophic gastritis, intestinal metaplasia, dysplasia, and intestinal-type gastric adenocarcinoma.

14. CagA-positive H. pylori

Two patients have H. pylori infection. One strain is cagA-positive and is associated with more severe gastroduodenal disease.

Which mechanism best explains the higher pathogenic potential?

A. Loss of all bacterial urease activity
B. Complete prevention of epithelial inflammation
C. Delivery of virulence factors that alter epithelial signaling and intensify inflammatory/neoplastic risk
D. Selective inhibition of B-cell antigen presentation

Answer: C

Mechanism: **cagA-positive H. pylori** strains are linked to more severe disease because they alter epithelial signaling and inflammatory responses.

15. Testing after H. pylori eradication

A patient completes therapy for H. pylori. Urea breath test is scheduled, but he has continued PPI therapy until the day before testing.

Why may this strategy be misleading?

A. PPIs increase urease activity and cause false-positive results
B. PPIs suppress bacterial load/urease activity and may cause **false-negative** noninvasive tests
C. PPIs permanently eliminate antibody production
D. PPIs convert H. pylori into Candida

Answer: B

Mechanism: Noninvasive tests that depend on active organism/urease activity can be falsely negative when bacterial density is suppressed by **PPI**, antibiotics, or bismuth.

16. Antibiotic resistance in refractory H. pylori

A patient remains H. pylori positive after clarithromycin-containing triple therapy. He previously received macrolides for respiratory infections.

Which mechanism best explains likely treatment failure?

A. Autoimmune destruction of D cells
B. Host CDH1 mutation causing antibiotic malabsorption
C. **Macrolide resistance** reducing clarithromycin efficacy
D. Somatostatin receptor downregulation

Answer: C

Mechanism: Prior macrolide exposure increases the likelihood of **clarithromycin-resistant H. pylori**, making empiric clarithromycin regimens less rational after failure.

17. Bismuth quadruple therapy logic

After failed clarithromycin triple therapy, a man receives bismuth, tetracycline, metronidazole, and a PPI.

Which principle best explains this rescue strategy?

A. It avoids reliance on clarithromycin and uses multi-agent luminal antibacterial pressure with acid suppression
B. It treats H. pylori by blocking the IL-4 receptor
C. It restores intrinsic factor secretion
D. It induces gastric ECL-cell apoptosis

Answer: A

Mechanism: **Bismuth quadruple therapy** is useful after macrolide exposure/failure because it avoids clarithromycin dependence and combines several antibacterial mechanisms with acid suppression.

18. Zollinger-Ellison syndrome and diarrhea

A 48-year-old man has refractory ulcers, fasting gastrin >1000 pg/mL, gastric pH 1.3, and chronic watery diarrhea.

Which mechanism best explains the diarrhea?

A. Autoimmune parietal-cell destruction causing achlorhydria
B. Fundic gland polyposis causing mechanical obstruction
C. Dopamine D2 receptor excess causing rapid colonic transit
D. Massive acid secretion inactivating pancreatic enzymes and injuring small-bowel mucosa

Answer: D

Mechanism: In **Zollinger-Ellison syndrome**, acid hypersecretion can overwhelm duodenal neutralization, impair pancreatic enzymes, precipitate bile salts, and cause diarrhea.

19. Hypergastrinemia differential diagnosis

A man on high-dose PPI has fasting gastrin 900 pg/mL. Another patient has gastrin 1400 pg/mL with gastric pH 1.5 and multiple jejunal ulcers.

Which interpretation is most mechanistically sound?

A. Gastrin level alone proves gastrinoma in both patients
B. **Gastric pH** distinguishes acid-suppressed/atrophic hypergastrinemia from gastrinoma-related acid hypersecretion
C. A high gastrin level excludes MEN1
D. Secretin always suppresses gastrinomas

Answer: B

Mechanism: Hypergastrinemia must be interpreted with **gastric acid status**. High gastrin plus **acidic pH** is much more suggestive of gastrinoma than high gastrin from PPI use or atrophic gastritis.

20. Secretin stimulation in gastrinoma

A patient with recurrent ulcers has moderately elevated fasting gastrin and gastric pH <2. Secretin stimulation produces a marked rise in gastrin.

Which mechanism best explains the paradoxical response?

A. Secretin always stimulates normal antral G cells
B. Secretin suppresses all gastrin-producing tumors
C. Gastrinoma cells can express secretin-responsive signaling that paradoxically increases gastrin release
D. Secretin neutralizes acid and falsely raises serum gastrin through assay interference

Answer: C

Mechanism: The **secretin test** exploits a paradoxical rise in gastrin from gastrinoma cells, unlike normal physiologic regulation.

21. MEN1 and gastrinoma management

A 43-year-old man with MEN1 has gastrinoma and primary hyperparathyroidism. His ulcer symptoms worsen during hypercalcemia.

Which mechanism best explains why parathyroid disease matters?

A. Hypercalcemia can stimulate gastrin/acid physiology and worsen ZES; parathyroid treatment may improve acid hypersecretion
B. Hyperparathyroidism directly causes H. pylori urease expression
C. Hypercalcemia irreversibly inhibits pancreatic bicarbonate secretion

D. MEN1 gastrinomas are always sporadic gastric NET type 3 tumors

Answer: A

Mechanism: In **MEN1/ZES**, hyperparathyroidism can aggravate acid hypersecretion physiology. Treating hyperparathyroidism may improve ulcer control.

22. Ménétrier disease and EGFR signaling

A 52-year-old man has giant gastric folds, hypochlorhydria, peripheral edema, and low serum albumin. Biopsy shows marked foveolar hyperplasia.

Which molecular pathway best explains the disease?

A. KIT exon 11 activation in interstitial cells of Cajal
B. CDH1 loss causing signet-ring cell infiltration
C. Antral D-cell loss causing hyperchlorhydria
D. **TGF-alpha/EGFR** activation causing foveolar hyperplasia and protein loss

Answer: D

Mechanism: **Ménétrier disease** is associated with increased TGF-alpha/EGFR signaling, foveolar hyperplasia, hypochlorhydria, and protein-losing gastropathy.

23. Autoimmune metaplastic atrophic gastritis

A 67-year-old woman has B12 deficiency, anti-parietal cell antibodies, achlorhydria, and markedly elevated gastrin. Endoscopy shows corpus-predominant atrophy.

Which mechanism best explains the hypergastrinemia?

A. Increased acid output stimulating antral G cells
B. Loss of parietal-cell acid removes negative feedback, producing **compensatory G-cell hypergastrinemia**
C. CagA-mediated direct gastrin gene insertion
D. D2 receptor antagonism from metoclopramide

Answer: B

Mechanism: Parietal-cell loss causes **achlorhydria**, removing acid-mediated inhibition of gastrin release. The resulting hypergastrinemia can drive ECL-cell changes.

24. Type 1 gastric NET pathogenesis

A woman with autoimmune gastritis has multiple small gastric body polyps. Biopsy shows well-differentiated ECL-cell neuroendocrine tumors. Gastrin is high and gastric acid is low.

Which mechanism best explains these tumors?

A. Sporadic aggressive NET biology with normal gastrin
B. Gastrinoma-related hypergastrinemia with high acid output
C. PDGFRA mutation in interstitial cells of Cajal
D. Chronic **hypergastrinemia** causing ECL-cell hyperplasia/neoplasia in atrophic gastritis

Answer: D

Mechanism: **Type 1 gastric NETs** arise in chronic atrophic gastritis: low acid leads to high gastrin, which trophically stimulates **ECL cells**.

25. Type 2 gastric NET in MEN1/ZES

A man with MEN1, severe acid hypersecretion, and duodenal gastrinoma has multiple small gastric body NETs.

Which profile best fits type 2 gastric NET biology?

A. High gastrin with **high gastric acid secretion** due to gastrinoma
B. Normal gastrin with solitary aggressive large tumor
C. Low gastrin with achlorhydria
D. CDH1 mutation with diffuse signet-ring carcinoma

Answer: A

Mechanism: **Type 2 gastric NETs** are gastrin-driven ECL tumors associated with **ZES/MEN1**; unlike type 1, acid secretion is high.

26. Type 3 gastric NET biology

A 61-year-old man has a solitary 3-cm gastric neuroendocrine tumor with normal gastrin and normal acid secretion. Imaging shows nodal disease.

Which mechanism-based classification is most appropriate?

A. Type 1 NET from autoimmune gastritis
B. **Type 3 sporadic gastric NET**, usually larger, solitary, and more aggressive
C. Type 2 NET due to MEN1/ZES
D. Hyperplastic polyp with foveolar hyperplasia

Answer: B

Mechanism: **Type 3 gastric NETs** are sporadic, often solitary, larger, normal-gastrin tumors with higher metastatic risk than type 1 or 2.

27. Chromogranin A biomarker trap

A patient on chronic high-dose PPI has an elevated chromogranin A during evaluation for suspected gastric neuroendocrine tumor.
Which mechanism best explains why this biomarker may mislead?
A. PPI therapy eliminates all ECL-cell activity and falsely lowers chromogranin A
B. PPI-induced hypochlorhydria increases gastrin and ECL-cell stimulation, which can raise **chromogranin A**
C. Chromogranin A is specific for GIST
D. Chromogranin A directly measures gastric acid output
Answer: B
Mechanism: Chromogranin A can rise with hypergastrinemic ECL stimulation, especially during PPI therapy; it is not a perfectly specific tumor marker.

28. Fundic gland polyps and PPI exposure

A 55-year-old woman on long-term PPI has multiple small, translucent fundic/body polyps. Biopsies confirm fundic gland polyps without dysplasia.
Which mechanism best explains the association?
A. H. pylori-driven foveolar regeneration in the antrum
B. CDH1 loss causing diffuse infiltrative carcinoma
C. Chronic acid suppression with hypergastrinemic changes and cystic dilation of fundic glands
D. IgG4-mediated fibroinflammatory disease
Answer: C
Mechanism: Sporadic/PPI-associated **fundic gland polyps** are usually small body/fundus polyps with very low malignant potential, unlike FAP-associated polyposis.

29. Fundic gland polyposis and FAP/GAPPS clue

A 34-year-old man has innumerable fundic gland polyps. His antrum is spared. Colonoscopy is normal, but family history shows proximal gastric cancer.
Which mechanism/syndrome is most important to consider?
A. Gastric adenocarcinoma and proximal polyposis of the stomach related to APC promoter 1B abnormality
B. H. pylori antral hyperplastic polyposis
C. Ménétrier disease from TGF-alpha overexpression
D. Sporadic PPI-related fundic gland polyps with no inherited implication
Answer: A
Mechanism: GAPPS produces proximal fundic gland polyposis with antral sparing and increased gastric adenocarcinoma risk, distinct from ordinary PPI-associated fundic gland polyps.

30. Hyperplastic gastric polyp

A 68-year-old man with chronic H. pylori gastritis has a 15-mm antral polyp. Histology shows elongated tortuous foveolar epithelium with inflamed edematous stroma.
Which mechanism best explains this lesion?
A. Constitutive KIT activation in interstitial cells of Cajal
B. Loss of E-cadherin causing signet-ring infiltration
C. Chronic mucosal injury/inflammation producing **foveolar hyperplasia**
D. Secretin-responsive gastrinoma
Answer: C
Mechanism: Hyperplastic polyps develop in response to chronic inflammation such as H. pylori or autoimmune gastritis and can regress after treating the underlying injury.

31. Gastric adenoma malignant potential

A 72-year-old man has a 12-mm gastric polyp. Biopsy shows adenomatous dysplasia. A trainee suggests sampling only because the lesion is small.
Which mechanism-based management principle is best?
A. Observe because gastric adenomas lack malignant potential
B. Resect because **adenomatous epithelium** represents a true premalignant neoplastic pathway
C. Treat with PPI because adenomas are caused by acid excess
D. Treat with metoclopramide because adenomas are motility lesions
Answer: B
Mechanism: Gastric adenomas have definite malignant potential and are generally resected rather than observed as benign inflammatory polyps.

32. Gastric intestinal metaplasia risk biology

A patient with H. pylori gastritis has extensive gastric intestinal metaplasia involving antrum and corpus, with incomplete colonic-type features.
Which interpretation is most appropriate?

A. Intestinal metaplasia is unrelated to gastric cancer risk
B. Complete IM always carries higher risk than incomplete IM
C. Extensive/incomplete **intestinal metaplasia** reflects advanced field injury in the Correa cascade
D. IM is diagnostic of MALT lymphoma

Answer: C

Mechanism: **Gastric intestinal metaplasia** is part of the chronic injury-cancer pathway. Extent, subtype, family history, and persistent inflammation influence risk.

33. Diffuse gastric cancer and E-cadherin

A 38-year-old woman from a family with early diffuse gastric cancer has a germline CDH1 mutation. Endoscopic biopsies are repeatedly negative despite concern.

Which mechanism explains the surveillance difficulty and cancer risk?

A. CagA-induced antral D-cell loss causing visible duodenal ulcers
B. KIT activation causing a submucosal spindle-cell tumor
C. TGF-alpha/EGFR activation causing giant foveolar folds
D. Loss of **E-cadherin** disrupts cell adhesion, allowing diffuse signet-ring infiltration beneath subtle mucosa

Answer: D

Mechanism: **CDH1/E-cadherin** loss is central to hereditary diffuse gastric cancer and linitis plastica biology; early lesions can be hard to detect by routine endoscopy.

34. Intestinal versus diffuse gastric adenocarcinoma

A 70-year-old man has a distal polypoid gastric cancer arising in a background of atrophic gastritis and intestinal metaplasia.

Which pathobiologic subtype is most likely?

A. **Intestinal-type adenocarcinoma** related to chronic gastritis-metaplasia-dysplasia sequence
B. Diffuse-type carcinoma due primarily to CDH1 loss
C. Type 1 gastric NET due to hypergastrinemia
D. GIST due to KIT activation

Answer: A

Mechanism: **Intestinal-type gastric cancer** usually follows chronic inflammation, atrophy, intestinal metaplasia, and dysplasia, often in older men and distal stomach.

35. Linitis plastica

A 44-year-old woman has early satiety, weight loss, and a rigid nondistensible stomach with thickened folds. Biopsies show poorly cohesive signet-ring cells.

Which mechanism best explains the gross appearance?

A. Acid hypersecretion causing giant folds with protein loss
B. Bacterial urease causing superficial erosions only
C. Diffuse infiltrative growth from **loss of cell adhesion**, producing a stiff leather-bottle stomach
D. ECL-cell hyperplasia due to achlorhydria

Answer: C

Mechanism: **Linitis plastica** is diffuse infiltrative gastric carcinoma, often signet-ring/diffuse type, related to impaired cell adhesion and submucosal spread.

36. H. pylori and gastric MALT lymphoma

A 59-year-old woman has localized low-grade gastric MALT lymphoma and active H. pylori gastritis.

Why can eradication therapy induce remission?

A. Antibiotics directly inhibit BCL-ABL tyrosine kinase
B. The lymphoma may remain dependent on chronic **H. pylori antigen-driven B-cell stimulation**
C. PPIs destroy malignant B cells by acidification
D. Bismuth chelates monoclonal light chains

Answer: B

Mechanism: Low-grade gastric **MALT lymphoma** may be antigen-dependent. Removing H. pylori can remove the proliferative drive and induce regression.

37. MALT lymphoma and loss of antibiotic responsiveness

A man with gastric MALT lymphoma fails to regress despite confirmed H. pylori eradication. Molecular testing shows an abnormality that activates downstream NF-kappaB signaling independent of antigen stimulation.

Which mechanism best explains failure of eradication alone?

A. The tumor has become **antigen-independent** through constitutive survival signaling
B. Antibiotics increase D-cell somatostatin tone
C. PPI-induced hypochlorhydria always prevents lymphoma regression
D. ECL-cell hyperplasia transforms into signet-ring carcinoma

Answer: A

Mechanism: Some MALT lymphomas acquire oncogenic signaling that no longer depends on H. pylori antigen drive, so eradication alone may fail.

38. GIST receptor tyrosine kinase biology

A 64-year-old man has a gastric subepithelial mass. Biopsy shows spindle cells positive for CD117 and DOG1. Mutation testing shows KIT exon 11 activation.

Which mechanism best explains tumor biology and targeted therapy?

A. Loss of E-cadherin causing signet-ring infiltration
B. Antigen-driven marginal-zone B-cell proliferation
C. TGF-alpha/EGFR-driven foveolar hyperplasia
D. Constitutive **KIT receptor tyrosine kinase** signaling that can be inhibited by imatinib

Answer: D

Mechanism: **GISTs** arise from interstitial cells of Cajal and commonly harbor activating **KIT** or **PDGFRA** mutations. Imatinib targets this kinase signaling.

39. GIST risk stratification

Two gastric GISTs are resected. One is 1.5 cm with very low mitotic rate; the other is 8 cm with high mitotic rate. Both have bland cytology.

Which principle best predicts behavior?

A. Benign microscopic appearance alone excludes aggressive behavior
B. All gastric GISTs behave identically regardless of size
C. Risk is driven by **size, mitotic rate, and site**, not by bland cytology alone
D. Nodal staging is the dominant determinant in all GISTs

Answer: C

Mechanism: GIST behavior is predicted by **tumor size**, **mitotic activity**, and **location**. Gastric GISTs generally have better prognosis than small-bowel GISTs at similar size/mitotic rate.

40. SDH-deficient gastric GIST

A 19-year-old woman has multifocal gastric GISTs. Tumor is KIT/PDGFRA wild-type and lacks SDHB staining.

Which mechanism best explains this tumor group?

A. H. pylori antigen stimulation of B cells
B. Loss of **succinate dehydrogenase** function causing SDH-deficient GIST biology
C. Antral D-cell loss and hyperchlorhydria
D. CDH1 mutation causing diffuse adenocarcinoma

Answer: B

Mechanism: Some wild-type gastric GISTs are **SDH-deficient**, often in younger patients, frequently gastric and multifocal, and may show loss of SDHB staining.

41. Gastric outlet obstruction from peptic disease

A 58-year-old man with long-standing duodenal ulcer disease develops early satiety, non-bilious vomiting, and hypochloremic metabolic alkalosis. Endoscopy shows a scarred pyloroduodenal channel.

Which mechanism best explains the biochemical pattern?

A. Colonic chloride secretion due to bile acids
B. Pancreatic bicarbonate loss from a fistula
C. Renal tubular acidosis from autoimmune gastritis
D. Loss of gastric HCl through vomiting with volume contraction maintaining alkalosis

Answer: D

Mechanism: **Gastric outlet obstruction** causes persistent vomiting of gastric acid, producing hypochloremic, hypokalemic metabolic alkalosis and volume depletion.

42. Dumping syndrome after gastric surgery

A patient after partial gastrectomy develops palpitations, flushing, cramping, and diarrhea 20 minutes after meals. Another episode of hypoglycemia occurs 2 hours after sweets.

Which mechanism best explains the combined syndrome?

A. Rapid nutrient delivery causing early osmotic/autonomic symptoms and later incretin-mediated insulin excess
B. Delayed gastric emptying due to pylorospasm
C. H. pylori urease causing ammonia toxicity
D. Gastrinoma causing late hypoglycemia

Answer: A

Mechanism: **Dumping syndrome** reflects rapid gastric emptying. Early dumping is osmotic/vasomotor; late dumping is related to rapid carbohydrate absorption and exaggerated insulin response.

43. Gastric stump cancer

A 71-year-old man had Billroth II surgery for benign ulcer disease 25 years ago. He now has anemia and a friable lesion at the gastrojejunal anastomosis.

Which carcinogenic mechanism is most plausible?

A. Direct metoclopramide toxicity to the anastomosis
B. Loss of KIT autoinhibition in ECL cells
C. Chronic bile/pancreatic reflux, bacterial overgrowth, nitrosamine exposure, and mucosal atrophy at the anastomosis
D. Secretin-induced gastrin release from antral remnant only

Answer: C

Mechanism: Post-gastrectomy cancer risk relates to chronic anastomotic injury, **enterogastric bile reflux**, hypochlorhydria, bacterial overgrowth, and nitrosating compounds over many years.

44. Gastric volvulus

An elderly woman with a large paraesophageal hernia develops severe epigastric pain, repeated retching without vomiting, and inability to pass a nasogastric tube.

Which mechanism best explains the emergency?

A. Antigen-driven B-cell proliferation in the gastric wall
B. Rotation of the stomach causing closed-loop obstruction and risk of ischemia
C. Motilin receptor overstimulation
D. Antral D-cell loss causing acid hypersecretion

Answer: B

Mechanism: **Gastric volvulus** is mechanical twisting of the stomach, often around a hernia, causing obstruction, retching, NG-tube failure, and ischemic risk.

45. Bezoar in gastroparesis

A diabetic patient with gastroparesis develops early satiety and vomiting. Endoscopy shows a large phytobezoar.

Which mechanism best explains bezoar formation?

A. Excess gastric acid digests cellulose into solid concretions
B. H. pylori urease polymerizes dietary fiber
C. D2 receptor blockade causes pyloric stenosis
D. Delayed emptying permits accumulation and concretion of indigestible plant fibers

Answer: D

Mechanism: **Gastroparesis** predisposes to bezoar formation because retained indigestible material accumulates in a poorly emptying stomach.

46. G-POEM in refractory gastroparesis

A patient with refractory gastroparesis has evidence of pyloric dysfunction and poor response to prokinetics. Endoscopic pyloromyotomy is considered.

Which mechanism best supports this approach?

A. Reducing **pyloric outflow resistance** may improve gastric emptying in selected patients
B. Ablating the fundus restores intrinsic factor secretion
C. Myotomy suppresses H. pylori urease activity
D. Myotomy blocks all vagal afferent nausea signaling permanently

Answer: A

Mechanism: **G-POEM** targets pyloric resistance/pylorospasm in selected refractory gastroparesis, a different strategy from antral prokinetic therapy.

47. Gastric electrical stimulation

A patient with refractory diabetic gastroparesis has dominant nausea and vomiting but little abdominal pain. Gastric electrical stimulation is discussed.

Which explanation is most accurate?

A. It reliably cures abdominal pain by increasing acid secretion
B. It works only by accelerating emptying to normal in all patients
C. It may improve **nausea/vomiting** through neuromodulatory effects despite uncertain or variable emptying changes
D. It is contraindicated only when nausea is the dominant symptom

Answer: C

Mechanism: **Gastric electrical stimulation** appears to improve nausea/vomiting more than pain, possibly through neuromodulation of afferent/vagal/CNS pathways rather than simple normalization of emptying.

48. Aspirin/NSAID gastric injury

A 76-year-old woman on naproxen develops gastric erosions. She has no H. pylori infection.

Which mechanism best explains NSAID gastropathy?

A. Selective stimulation of prostaglandin synthesis

B. COX inhibition reducing protective **prostaglandins**, mucus, bicarbonate, and mucosal blood flow
C. D-cell hyperplasia causing achlorhydria
D. KIT activation in interstitial cells of Cajal

Answer: B

Mechanism: NSAIDs damage gastric mucosa by topical injury and **COX inhibition**, which reduces prostaglandin-mediated mucosal defense.

49. Misoprostol for NSAID ulcer prevention

A high-risk patient must continue NSAIDs. Misoprostol is considered but limited by diarrhea and cramping.

Which receptor-level mechanism explains its gastric protection?

A. D2 receptor blockade enhancing gastric emptying
B. H2 receptor antagonism suppressing histamine signaling
C. Somatostatin receptor activation suppressing gastrinomas
D. **Prostaglandin E receptor** activation reducing acid secretion and enhancing mucus/bicarbonate defense

Answer: D

Mechanism: **Misoprostol** is a prostaglandin E analog that replaces prostaglandin-mediated mucosal protection lost during NSAID therapy.

50. HER2-positive gastric adenocarcinoma

A patient with metastatic intestinal-type gastric adenocarcinoma has HER2 overexpression on tumor testing. Trastuzumab is added to systemic therapy.

Which molecular rationale best supports this treatment?

A. HER2/ERBB2 is a receptor tyrosine kinase; antibody therapy inhibits oncogenic growth-factor signaling
B. HER2 blockade restores E-cadherin adhesion in hereditary diffuse gastric cancer
C. HER2 antibody therapy eradicates H. pylori antigenic stimulation
D. HER2 overexpression is a marker of ECL-cell hyperplasia only

Answer: A

Mechanism: **HER2** is a receptor tyrosine kinase. In HER2-positive gastric adenocarcinoma, trastuzumab targets an oncogenic signaling pathway rather than nonspecific cytotoxicity alone.

Answer Key

1-B; 2-D; 3-C; 4-A; 5-C; 6-D; 7-B; 8-A; 9-C; 10-D; 11-A; 12-B; 13-D; 14-C; 15-B; 16-C; 17-A; 18-D; 19-B; 20-C; 21-A; 22-D; 23-B; 24-D; 25-A; 26-B; 27-B; 28-C; 29-A; 30-C; 31-B; 32-C; 33-D; 34-A; 35-C; 36-B; 37-A; 38-D; 39-C; 40-B; 41-D; 42-A; 43-C; 44-B; 45-D; 46-A; 47-C; 48-B; 49-D; 50-A