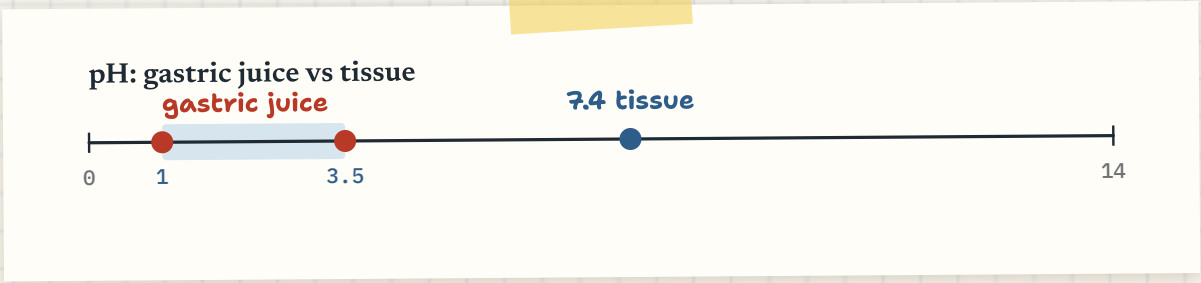
Gastric acid secretion

Parietal cell, three signals, one brake, two drugs



Step by step

1. Parietal cell in the body: HCl + intrinsic factor
2. Three drivers, one pump (H^+/K^+ ATPase)
3. Falling pH: D cells release somatostatin
4. Vagus suppresses somatostatin
5. PPI blocks the pump; H_2 blocker only H_2

INSIDE THE PARIETAL CELL

$$CO_2 + H_2O \rightarrow H_2CO_3 \rightarrow H^+ + HCO_3^-$$

H^+ out via H^+/K^+ ATPase (swaps for K^+); HCO_3^- to blood for Cl^-: alkaline tide

Target	Role
M_3 (acetylcholine)	Vagal drive; raises calcium
H_2 (histamine)	Raises cAMP; the hub
CCK_2 (gastrin)	Mainly via ECL histamine
Somatostatin (D cell)	Cuts gastrin and histamine
PPI	Irreversible block of the pump
H_2 blocker	Competes at H_2 receptor

Signals and drugs

Rule of thumb

Three drivers, one pump

Histamine is the hub

Block the pump, block all three signals

Exam traps

- Gastrin acts mainly through ECL histamine, not directly.
- An H_2 blocker blocks only the histamine receptor.
- The vagus drives acid and suppresses somatostatin.

Gastric acid secretion: the parietal cell, step by step

Video, written lesson, practice question and sources: medservatory.com/usmle-step-1/gi-physiology-pathology/gastric-acid-secretion-parietal-cell

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