

Disorders of Swallowing

- Damage to Afferents :- V, IX, & X CN damage.
- ~~Damage~~ Damage to Brain stem :- ~~poly~~ poliomyelitis
encephalitis
- Damage to Efferents/muscle :- muscle dystrophy
Myasthenia Gravis

- Consequences
- Complete abrogation of swallowing act
 - Food in trachea (failure of glottis to close)
 - Food in nose (failure of soft palate/uvula)

deep anaesthetic patients vomits

↓
No swallowing back

↓
Vomit enters trachea

↓
Choke to death

↓
Damage to neural network of Myenteric Plexus (lower 2/3 oesophagus)

↓
loss the ability to send signals to cause "Receptive Relaxation" of lower oesophageal sphincter.

↓
Accumulation food for long time $\Rightarrow$ Mega-oesophagus

↓
Usually causes oesophageal ulcers.

Treatment :- balloon inflated at lower oesophagus
Antispasmodic drugs for its relaxation.

Stomach $\rightarrow$ Slow Absorption $\xrightarrow{\text{due to}}$ Gastric Barrier.

$\left\{ \begin{array}{l} \rightarrow \text{Mucosal lining} \\ \rightarrow \text{Tight epithelial junctions} \end{array} \right.$

In Gastritis $\rightarrow$ permeability of Gastric Barrier inc

$\Downarrow$
HCl enters through this barrier & damage to stomach mucosa

$\Downarrow$
Mucosa susceptible for peptic digestion

$\Downarrow$
 $\therefore$ Causes Gastric Ulcers

Stomach cell secretes less HCl.
Stomach pH ≈ 6.5

$\Rightarrow \therefore$ Parietal cell secretes both HCl & Intrinsic factor

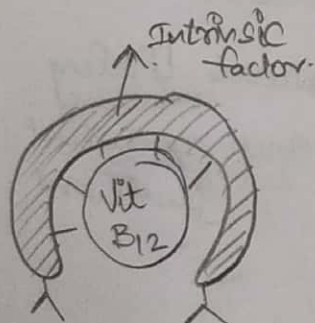
Achlorhydria is associated with pernicious Anaemia

Acid content $\xrightarrow{+}$ ENS $\rightarrow$ Ach $\xrightarrow{+}$ Peptic cells $\rightarrow$ Pepsinogen in Stomach

$\therefore$ Achlorhydria also affects pepsinogen secretion along with effecting pepsin activity (optimum pH = 2-3)

$\Rightarrow$ Without Intrinsic factor only 50% of Vit-B₁₂ is absorbed

Stomach



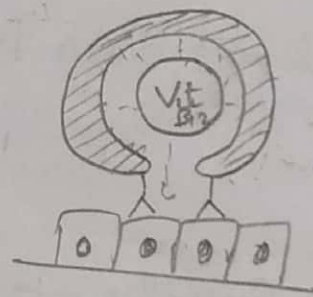
Intrinsic factor binds with Vit-B₁₂.

Intestine



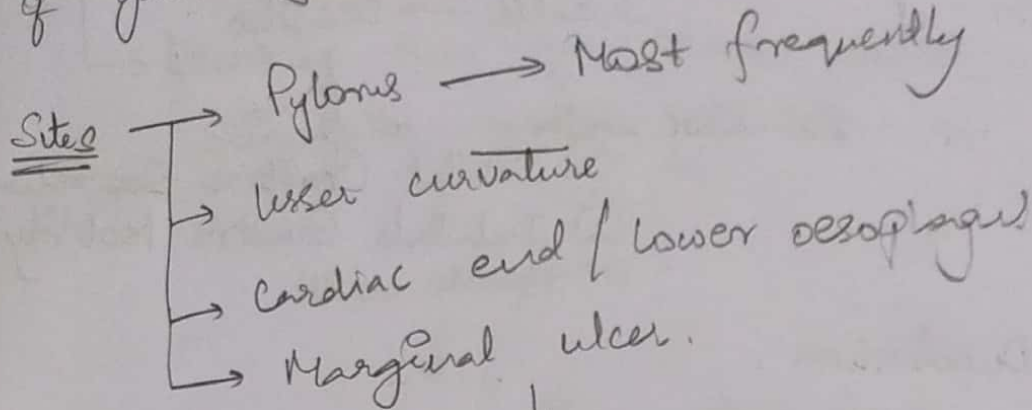
Binding of intrinsic factor, prevents digestion of Vit-B₁₂ in intestine

Ileum

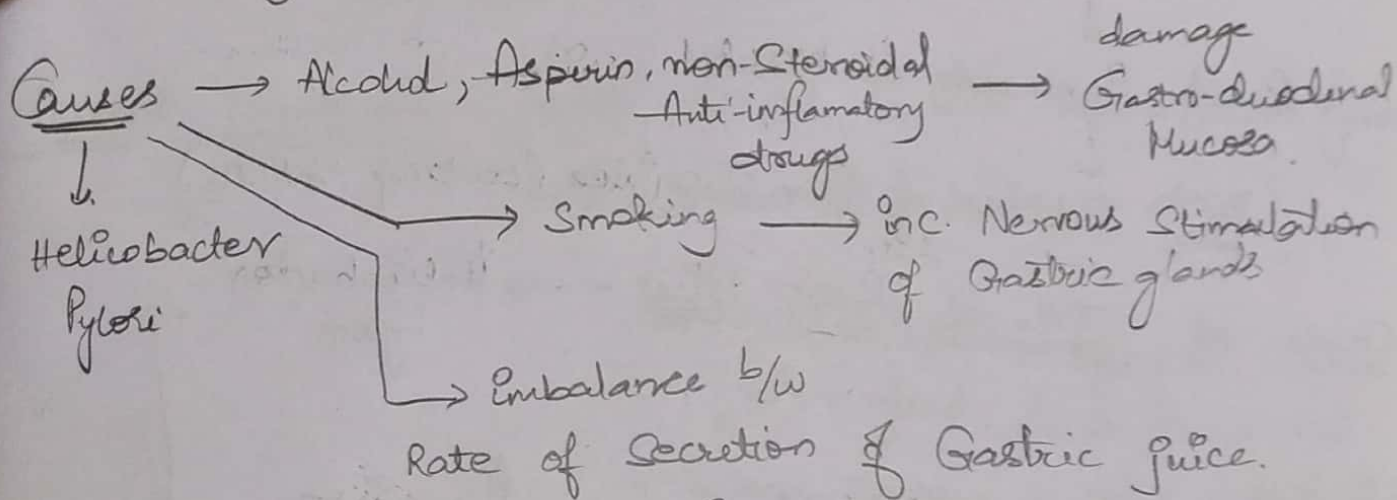


Intrinsic factor binds to intestinal epithelial cells at Ileum & helps in absorption of Vit-B₁₂

associated area of stomach caused principally by digestive action of gastric juice.

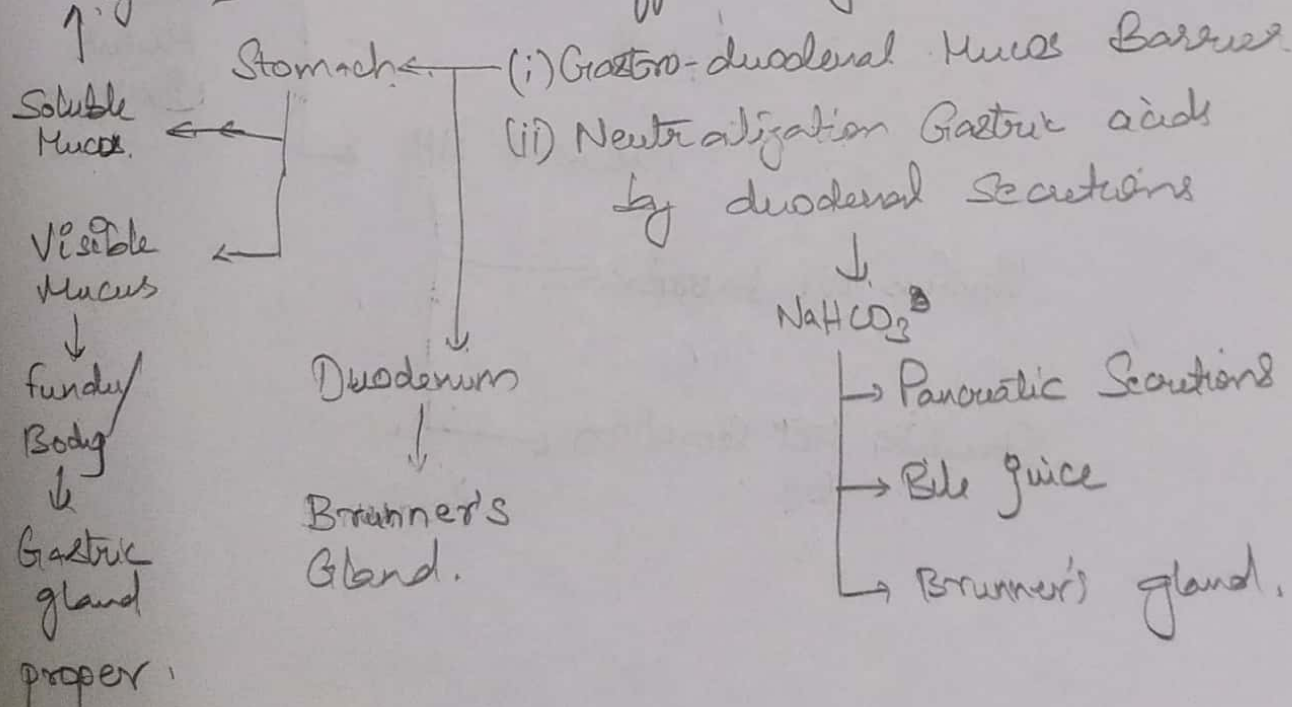


↓
During Gastro-jejunostomy.



Cardiac & Pyloric glands
↑

Protection afforded by.



Neutralization of acid:-

① Acid in duodenum
↓
's' cells → secretin

- ① Inhibit Gastric Secretion
- ② Inhibits Gastric Motility

② Acid in Duodenum

↓
Release of Secretin

↓
Reach Pancreas via Blood

↓
Inc Release of Pancreatic juice (containing NaHCO_3)

Cause of 75% of Peptic Ulcer → Helicobacter Pylori

Physical "Capability" to burrow through barrier

↓
Break Gastro Duodenal Mucus Barrier

Released NH_3

←
Liquifies the barrier

←
Stimulate HCl Secretion

Treatment in Past

- Removal of $\frac{4}{5}$ th of stomach → acid-peptide secretion dec
- Blocking two vagal trunk which stimulates gastric glands.

↓
Ulcer disappear

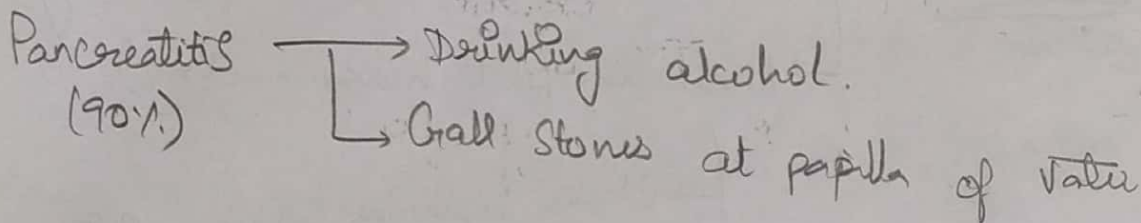
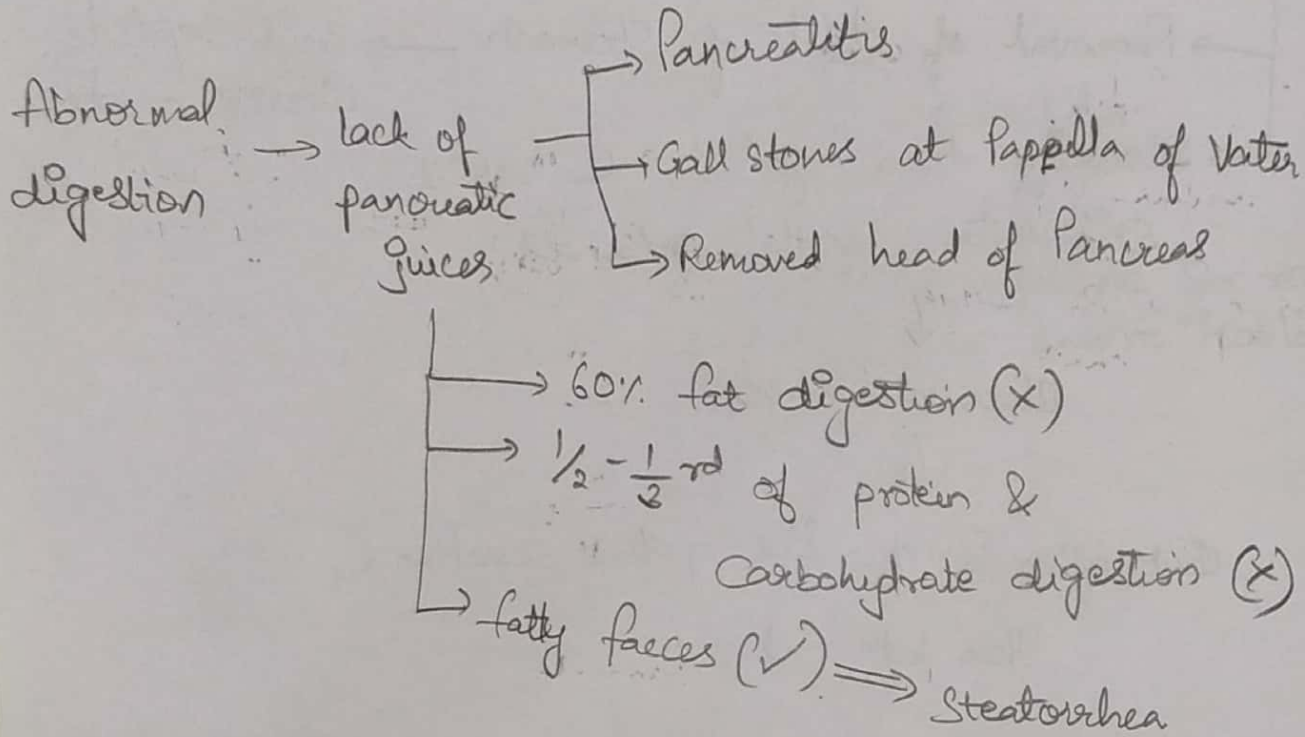
↓
But after few months gastric secretion $\uparrow$

Ulcer both returns.

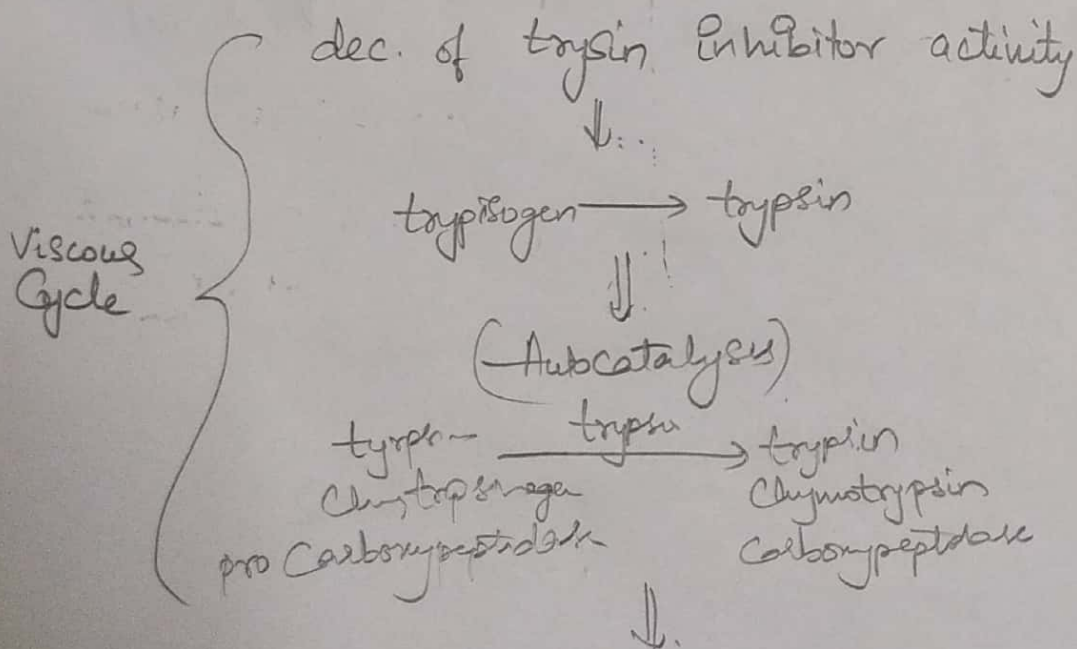
Present Treatment

- Anti-biotics to kill helicobacter pylori
- Ranitidine (Anti-histamine drug)

- Blocks histamine effect on gastric gland ∴ No inc in HCl
- Reduces 70-80% of HCl production



Accumulation of pancreatic juices at ducts



Digestion of large part of pancreas occur (or complete)

① Non-Tropical Sprue (or)

Celiac Sprue
(or)
Idiopathic Sprue
(or)
Gluten Enteropathy

toxic effect
of Gluten
↓
In
wheat
&
rye

destruction
of ① microvilli
② Villi

Treatment :- wheat/rye free diet

② Tropical Sprue ⇒ occurs in people of tropics ⇒ treated by antibacterial drugs

Impaired absorption of

- Carbohydrates & proteins ⇒ Nutrient deficiency
- Calcium ⇒ Osteomalacia
- Vit-K ⇒ inadequate blood coagulation
- folic acid & Vit-B₁₂ ⇒ Pernicious Anaemia

Causes

→ Irregular bowel habits → Inhibition of natural defecation reflex.
→ Over use of laxatives

∴ Progressively colon becomes Atonic.

Accumulation of faeces in sigmoid colon

⇒

Mega Colon (or) Hirschsprung's disease

⇒

Colon diameter — 3 to 4 inch

↓

Lack/deficiency of ganglion cells in Myenteric plexus in sigmoid colon

∴ Sigmoid Colon itself becomes small & causes Mega colon in Asc, desc, trans. colon.

Psychogenic Diarrhea —

Nervous tension

↓ ⊕

Para Sym. N.S.

⊕ distal colon motility

⊕ distal colon secretion

Virus }
 Bacteria } → Infection at distal ileum & colon
 ↓

Ulcerative Colitis → Irritates Intestinal mucosa

(Mass Movements) Colon motility inc. ⊕

In cholera,

⊕ ↓ ← Colon secretion inc. ⊕

Crypts secretion = 10-12 L.



But max. colonic absorption = 5-8 L.

→ ∴ fluid loss is excessive.

→ ∴ With therapy. → No death
 ↓
 replacing lost fluid Extravenously

→ Without therapy → 50% death is seen.

Spinal cord injury b/w cone medullaris & brain



inc. Abdominal Pressure & relaxation of Voluntary Sphincter

← Voluntary aid of Defecation (X)
 Basic defecation Reflex (✓)



enema at morning after meal



Normal defecation possible.

Stimulation of
CTZ — Chemoreceptor
Trigger
Zone

↓
Floor of 4th
ventricle

→ overdistention
→ irritation
→ over excited

→ Apo-morphine, morphine act here
to stimulate vomiting
→ Motion sickness

Vomiting Centre

Afferents → Vagus, Sympathetic nerves

↓
Brain (Vomiting)
stem centre

↓
Efferents → Upper GIT → V, IX, X, XI CN
Lower GIT → vagus & Sympathetic nerves
Diaphragm, Abd muscle → Spinal nerves

Anti-peristalsis ⇒ Before vomiting from Ileum to duodenum

↓
velocity — 2-3 cm/sec

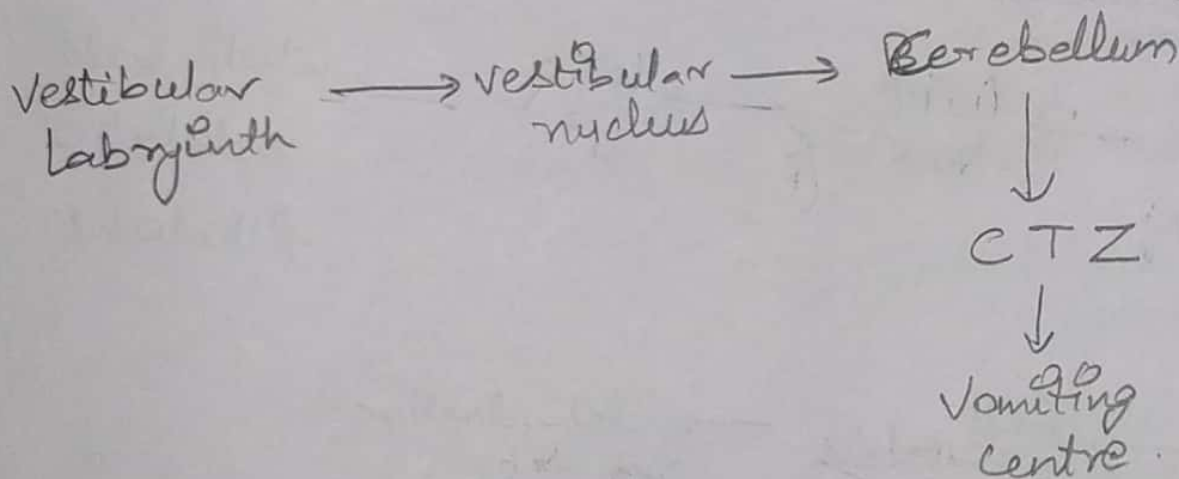
↓
finishes after 3-5 min

↓
Accumulation of food
at duodenum causes
distention

Vomiting Act

- ① Deep Breath
↓
- ② Raising hyoid bone & larynx → opens upper oesophageal sphincter
↓
- ③ Closing of Glottis by epiglottis
↓
- ④ Closing of Post. nares by soft palate & uvula
↓
- ⑤ Contraction of Diaphragm & Abd. muscle
↓
Inc. Intra Abd Pressure
↓
- ⑥ Opening of gastro-oesophageal sphincter

Motion Sickness



Causes

- Irritative impulses from GIT
- Impulses from brain (Motion sickness)
- Impulses from cerebral cortex

Gastro-intestinal Obstruction

causes

- Cancer
- fibrotic constriction resulting from
 - ulceration
 - peritoneal adhesion
- Spasm of gut wall
- Paralysis of gut wall.

Site of Obstruction

① At Pylorus (peptic ulcer) → Acidic vomiting → loss of H^+ → whole body metabolic Alkalosis

② Beyond Stomach → Anti peristalsis → dehydration & loss of stomach acid & loss of intestine base
∴ No change in acid-base balance

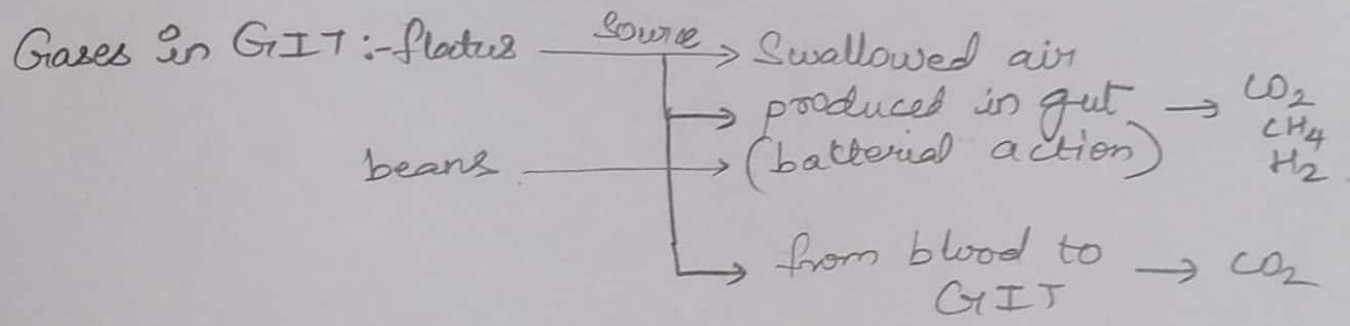
Large Intestine
↓
Accumulation of faeces

↓
Intense feeling of constipation but
not severe vomiting

↓
Large Intestine completely filled
∴ Food can't enter from
Small Intestine to Large Intestine

↓
Severe Vomiting (✓)

↓
Finally → Rupture of colon
→ Dehydration
→ Circulatory shock.



7-10L of gas enter ~~into~~ colon
↓
But 0.6L expelled remaining reabsorbed.

