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# **Vomiting**

## **Approach to diagnosis**

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# Definitions:

## *Nausea:*

Feeling "sick to the stomach", a sensation that is associated with the urge to vomit.

# Vomiting

Forceful expulsion of gastric contents through a relaxed upper oesophageal sphincter and open mouth.

it is brought on by coordinated gastric abd. and thoracic contractions and is often preceded by nausea and retching. *(Feldman et al., 2002)*

# Persistent vomiting

Can lead to dehydration, severe alkalosis, bleeding and rarely esophageal perforation.

# Retching

It involves the same physiological mechanisms as vomiting, but occurs against a closed glottis; there is no expulsion of gastric contents.

## **Regurgitation:**

Is the return of small amounts of food or secretions to the hypopharynx in the context of mechanical obstruction of the esophagus, gastroesophageal reflux disease or esophageal motility disorders.

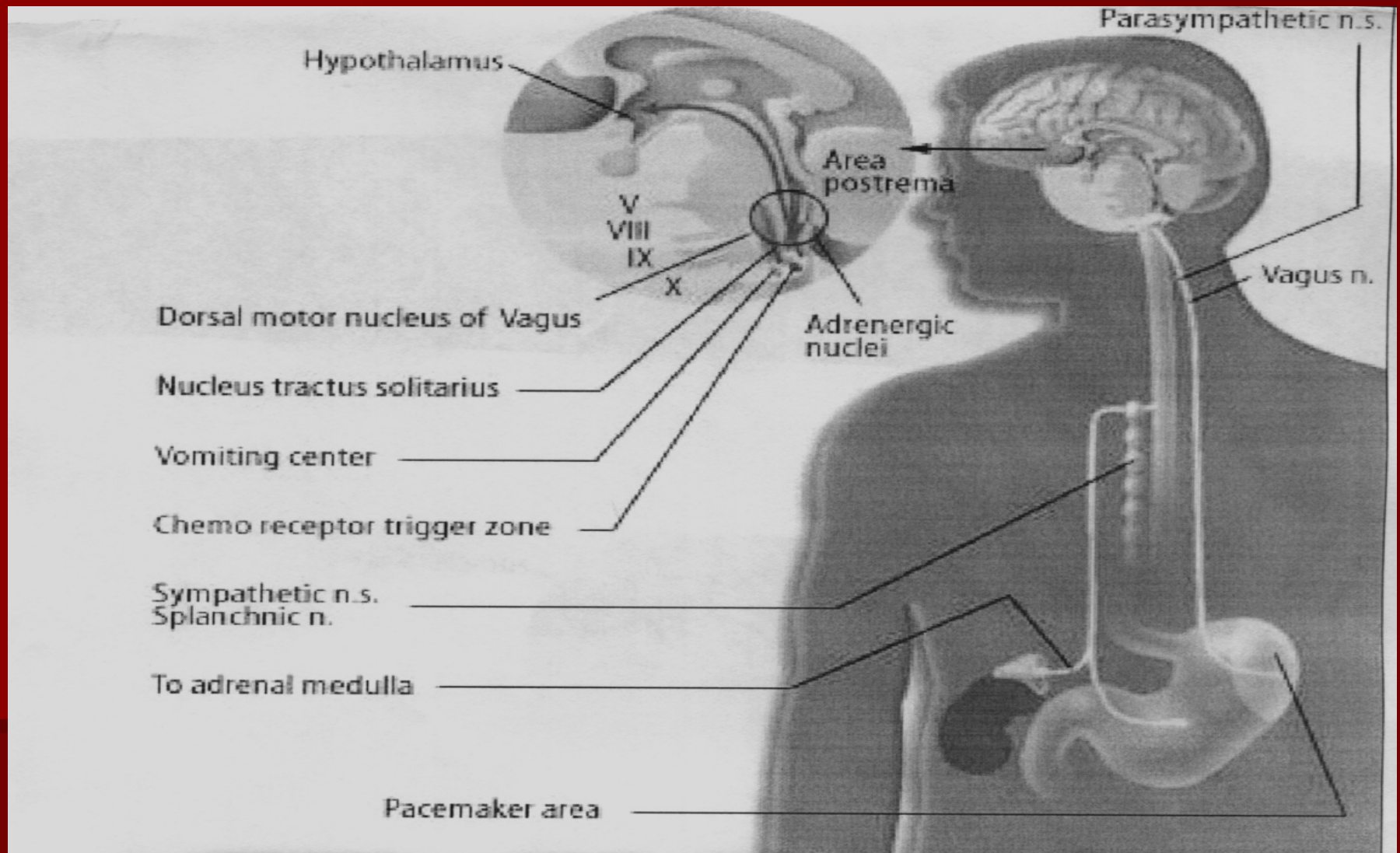
## **Rumination:**

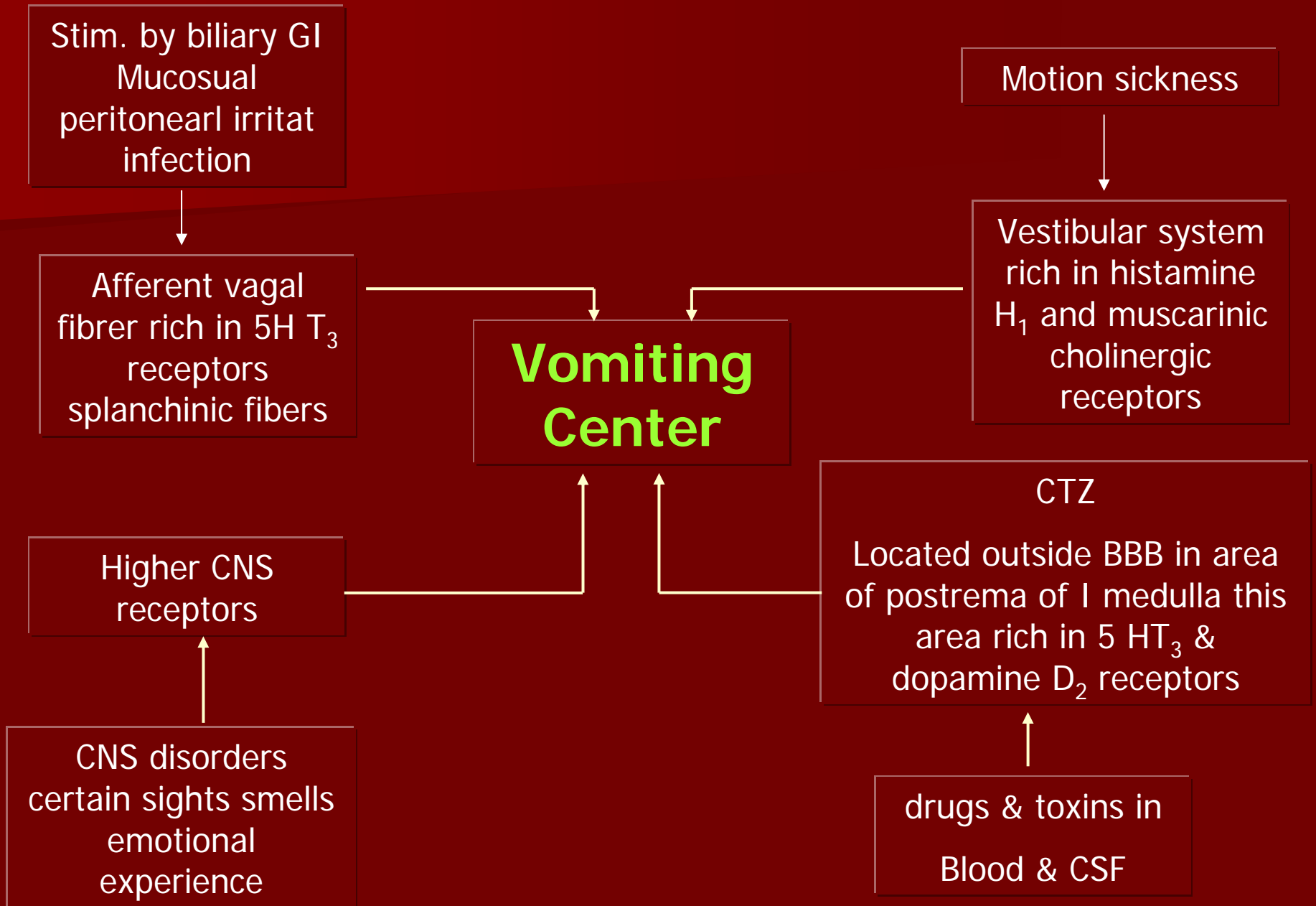
Is similar to regurgitation, except small amounts of completely swallowed food are returned to the hypopharynx from the stomach and is often re-swallowed.

## **NB:**

Rumination is not associated with nausea.

# Pathophysiology







# ***Classification***

***1- classification according  
to onset***

# A- Acute

## 1- Infections

- Viral gastroenteritis
- Toxin- mediated (food poisoning)
- Acute systemic infections

## 2- Gastrointestinal mechanical obstruction

- Acute gastric outlet obstruction.
- intrinsic small bowel obstruction
- ileus

## 3- Visceral pain

- Appendicitis
- Acute pancreatitis
- Mesenteric ischemia
- Peritonitis of any system

# Cont.

## 4- Central Nervous system

- Motion sickness
- Labyrinthitis (Meniere's)
- Migraine headaches

## 5- Systemic Condition

- Pregnancy
- Myocardial infarction.
- Renal failure.
- Diabetic ketoacidosis
- Radiation therapy

## 6- Medications/topical irradiation

- Chemotherapeutic agents.
- Nonsteroidal.
- Antibiotics.
- Digoxin.

# B- Chronic

## 1- Gastrointestinal mechanical obstruction

- Chronic gastric outlet obstruction.
- Small intestine obstruction.

## 2- Motility disorders

- Gastro-paresis
- Small intestine motility disorders.
  - chronic intestinal pseudo obstruction.
  - Familial visceral myo-neuropathy.

## 3- Psychogenic

- Bulimia
- Anorexia nervosa
- Psychogenic vomiting

## 4- others

- increased intracranial pressure.
- Metabolic: hyperthyroidism, renal failure, Addison's disease.
- Medication.

## ***2- Classification according to etiology***

**1- Intraperitoneal**

**2- Extra-peritoneal**

**3- Medications/Metabolic Disorders**

# Intraperitoneal

## - Obstructing disorders

- Pyloric obstruction
- Small bowel obstruction
- Colonic obstruction
- Superior mesenteric artery syndrome

## - Enteric infections

- Viral
- Bacterial

## - Inflammatory disease

- Cholecystitis
- Pancreatitis
- Appendicitis
- Hepatitis

# Cont.

## - Impaired motor function

- Gastro-paresis
- Intestinal pseudoobstruction
- Functional dyspepsia
- Gastroesophageal reflux

## - Biliary colic

## - irradiation

# Extra-peritoneal

## ■ **Cardiopulmonary disease**

- Cardiomyopathy
- Myocardial infarction

## ■ **Labyrinthine disease**

- Motion sickness
- Labyrinthitis
- Malignancy

## ■ **Intracerebral disorders**

- Malignancy
- Hemorrhage
- Abscess
- Hydrocephalus



# Cont.

- **Psychiatric illness**

- Anorexia and bulimia nervosa
- Depression

- **Postoperative vomiting**

- **Cyclic vomiting**

# Medications/Metabolic Disorders

## ■ Drugs

- Cancer chemotherapy
- Antibiotics
- Cardiac anti-arrhythmic
- Digoxin
- Oral contraceptives

## ■ Endocrine/metabolic disease

- Pregnancy
- Uremia
- Ketoacidosis
- Thyroid and parathyroid disease
- Adrenal insufficiency

## ■ Toxins

- Liver failure
- Ethanol

***Diagnosis of  
Vomiting***

# Clinical Picture

## ■ Symptoms

- Age.
- Sex.
- Onset.
- Onset after meal.
- Character of vomitus.
- Odour.
- Abd. pain whether it is relieved after vomiting.
- Symptoms of ↑↑ ICT.
- Chest pain.
- Fever.
- Weight loss.
- Therapeutic history.

## ■ Signs

- Manifestation of volume depletion.
- Jaundice
- Pulmonary abnormalities.
- Abdominal auscultation .
- Abdominal tenderness or involuntary guarding
- Palpable masses or adenopathy.
- Fecal blood.
- Papilloedema or visual field defect
- Manifestation of systemic, endocrinal and metabolic disease.
- Psychiatric evaluation.

# Investigation

## ■ Laboratory

- Electrolyte
- CBC → iron ↓ anemia
- Pancreatic enzymes & liver function tests.
- Hormonal assay.
- Pregnancy test.
- Serum level of incriminated drugs.

## ■ Naso-gastric tube

## ■ Radiological investigation

- Supine and upright abdominal radiograph.
- Barium swallow, meal and follow through
- Contrast small intestinal radiography
- Contrast barium enema.
- Abdominal ultrasound or CT.
- Head CT or MRI.

# Cont.

## ■ Endoscopic investigation

- Upper endoscopy.
- Colonoscopy.

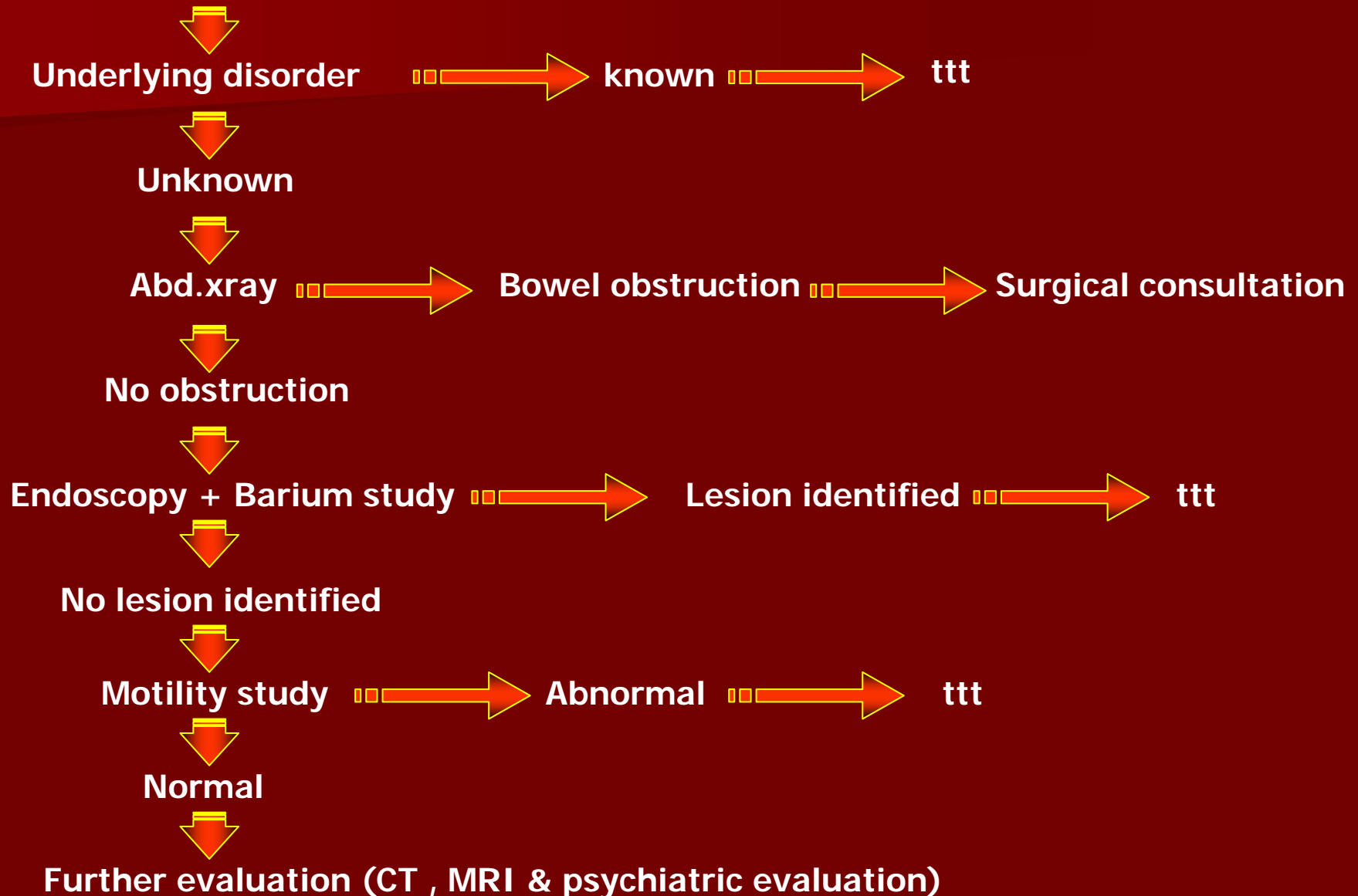
## ■ Gastro-intestinal motility study

- Gastric scintigraphy.
- Electrogastrography (EGG).
- Small intestinal manometry.

## ■ Open small intestinal biopsy (*smooth muscle or neuronal degeneration*).



- Initial evaluation with history, physical exam. & lab. evaluation.
- Restoration of normal fluid and electrolyte balance
- Empiric antiemetic therapy.



# Complications of Vomiting:

- Volume depletion & electrolyte disturbance
- Dental erosion and caries.
- Esophagitis
- Rupture esophagus (Boerhaave's syndrome).
- Rarely intra-abd. bleeding from splenic or hepatic laceration.

# **SPECIAL SITUATION OF VOMITING**

- **Thyrotoxicosis.**
- **Epidemic infectious vomiting.**
- **Cyclical vomiting syndrome.**
- **Superior mesenteric artery syndrome.**
- **Psychogenic vomiting.**
- **Nausea and Vomiting of Pregnancy.**

# Nausea and Vomiting of Pregnancy.

- Morning sickness.
- Hyperemesis gravidarum.
- Acute fatty liver of pregnancy.

# Morning sickness

Morning sickness of pregnancy begins between the 4th and 7th week after the last menstrual period in 80% of pregnant women and resolves by the 20th week of gestation in all but 10% of these Women.

# Hyperemesis gravidarum

Hyper-emesis gravidarum is a severe form of nausea and vomiting, affects one in 200 pregnant women. Clinical features include persistent vomiting, dehydration, ketosis, electrolyte disturbances.

Multiple gestation, gestational tropho-blastic disease increase incidence of hyperemesis gravidarum.

# Acute fatty liver of pregnancy

- Incidence 1 in 13.000 deliveries.
- Occurs in 3<sup>rd</sup> trimester.
- Usually associated with toxemia of pregnancy.
- Pregnancy should be terminated.



# Etiology

- 1- Hormonal
- 2- Gastrointestinal tract motility dysfunction
- 3- psychogenic
- 4- Infection with helicobacter pylori (*Jeffrey et al ., 2003*).

# Maternal and Fetal outcomes

- It is favorable in morning sickness.
- Increased incidence of low birth weight, fetal and maternal complication in hyperemesis.

# Pregnant

Rule out nonpregnancy causes.

+ ve

- ve

Dietary changes and  
emotional support

No resolution

Resolution

Options: pyridoxine (vitamin  
B6), doxylamine acupressure,  
ginger

Routine prenatal  
care

No resolution

Resolution

Routine prenatal care

No resolution

Check ketone and electrolyte levels.

Abnormal

**Options:** intravenous fluids, hospitalization, antiemetics, antihistamines, anticholinergics, corticosteroids

No resolution

Consider total parenteral nutrition.

Resolution

Routine prenatal care nutrition

Normal

Options: antiemetics, antihistamines, anticholinergics, corticosteroids

No resolution

Resolution

Routine prenatal care nutrition

# Treatment

Treatment	Mecganism	Examples	Dose	Clinical Indications
<b>Antiemetic agents</b>	Antihistaminergic	Dimenhydrinate, meclizine	50 mg/4h po	Motion sickness, inner ear disease
	Anticholinergic	Scopolamine patch	1.5 mg/3days	Motion sickness, inner ear disease
	Antidopaminergic	Prochlorperazine, droperidol	5-10 mg/6h po	Medication-, toxin-, or metabolic-induced emesis
	5-HT <sub>3</sub> antagonist	Ondansetron, granisetron	32mg over 15m. –IV	Chemotherapy- and radiation-induced emesis, postoperative emesis
	Tricyclic antidepressant	Amitriptyline, nortriptyline		Functional nausea
<b>Prokinetic agents</b>	5-HT <sub>4</sub> agonist	Cisapride	5-10 mg/6h po	Gastroparesis, functional dyspepsia, gastroesophageal reflux disease, intestinal pseudoobstruction
	5-HT <sub>4</sub> agonist and antidopaminergic	Metoclopramide	10-20 mg/6h po	Gastroparesis, functional dyspepsia,

Treatment	Mecganism	Examples	Dose	Clinical Indications
	Motilin agonist	Erythromycin		Gastroparesis, ?Intestinal pseudoobstruction
	Peripheral antidopaminergic	Domperidone	10-20 mg/6h po	Gastroparesis, functional dyspepsia
	Somatostatin analogue	Octreotide		Intestinal pseudoobstruction
<b>Special settings</b>	Benzodiazepines	Lorazepam	1-2 mg/6h	Anticipatory nausea and vomiting with chemotherapy
	Glucocorticoids	Methylprednisolone, dexamethasone		Chemotherapy- induced emesis
	Cannabinoids	Tetrahydrocannabinol	5 mg/m <sup>2</sup> sa	?Chemotherapy- induced emesis



**Thank you**