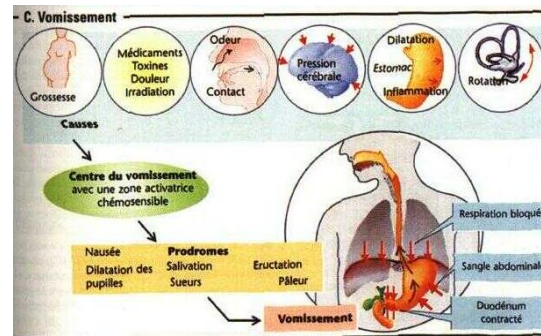


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# Vomissements

(Nouveau-né, Nourrisson, Enfant)



Dr Rahmoune H

MA en Pédiatrie

CHU Sétif - Université Sétif 1

- Les vomissements se définissent comme des **rejets actifs** de tout ou une partie du contenu gastrique ou intestinal par la bouche.
- Ils associent une contraction du diaphragme et des muscles de la paroi abdominale.

Symptôme très fréquent en pédiatrie.

Causes digestives et extradigestives → examen complet.

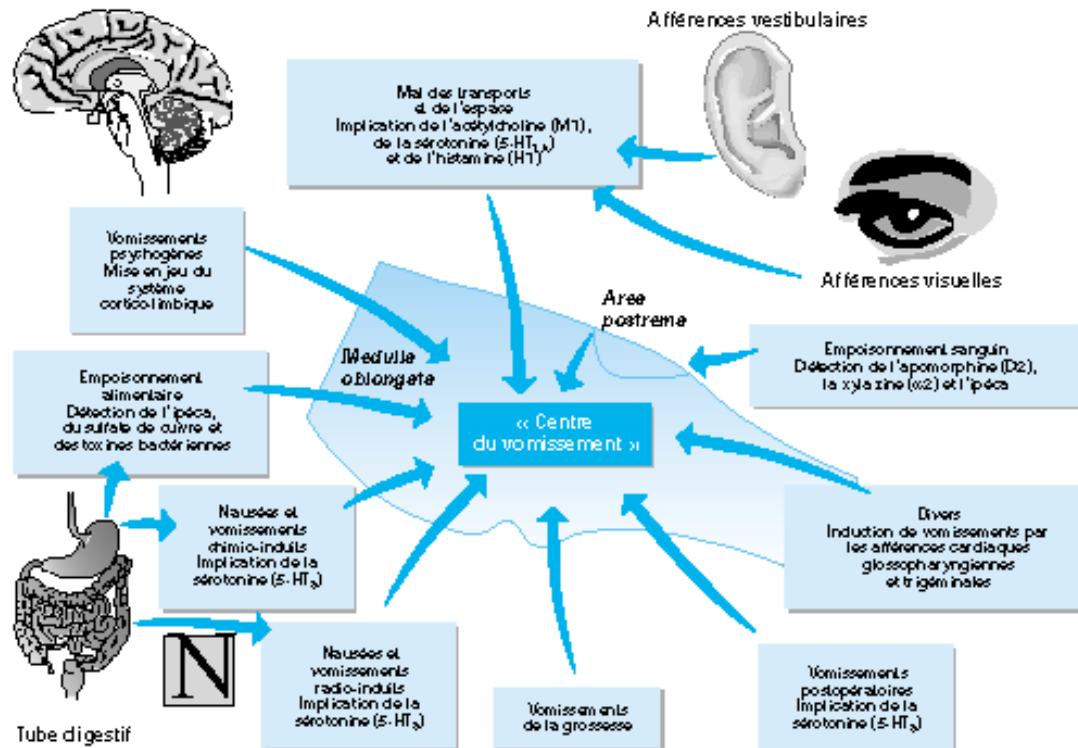
Rechercher en priorité une **urgence**  
chirurgicale, neurologique ou infectieuse.

# Diagnostic différentiel

Les vomissements sont à différencier:

- **des régurgitations**, qui sont de simples rejets post-prandiaux qui surviennent sans effort ;
- **du mérycisme**, qui se définit par une remontée volontaire ou automatique des aliments dans la bouche, suivie de leur re-déglutition  
( → terrain neuro-psychiatrique particulier\*\*\* )

# Physiopathologie



# Complications (V.Aigus)

## Troubles hydro-électrolytiques

(déshydratation extracellulaire, hémococoncentration, insuffisance rénale fonctionnelle, alcalose métabolique avec hypokaliémie et hypo-chlorémie)

## Complications respiratoires (pneumopathie d'inhalation)

## Complications mécaniques

- Syndrome de Mallory Weiss (déchirure de la muqueuse du cardia)
- Rupture spontanée de l'oesophage (syndrome de Boerhaave)

# Etiologies

Urgences chirurgicales	Causes digestives	Causes extradigestives	Causes fonctionnelles
Obstruction duodénale Volvulus Invagination Péritonite Étranglement herniaire SHP	RGO Infection (GEA) IPLV	Infectieuses Neurologiques (HSD, tumeurs) Endocriniennes (hyperplasie surrénale cg.) Métaboliques (hyper-Ca <sup>2+</sup> ), intoxication Rénales	Erreur de régime Vomissement acétonique Vomissement psychogène

SHP : sténose hypertrophique du pylore ; GEA : gastroentérite aiguë ; IPLV : intolérance aux protéines du lait de vache ; HSD : hématome sous-dural.

Signes évoquant une cause chirurgicale :

Vomissements bilieux  
Défense  
Altération de l'état général

**Une urgence chirurgicale doit toujours être éliminée dans un premier temps**

Surtout lorsqu'il existe :

- **des vomissements bilieux** ;
- une altération de l'état général ;
- des signes abdominaux



# Diagnostic étiologique

- Selon l'âge:
  - NN
  - NRS
  - Enfant
- Selon l'évolution: A/C

# Nouveau-né

- Selon le type de vomissements
  - Verts
  - Rouges
  - Blancs

– Verts : chirurgie\*\*\*

occlusion intestinale (haute sus-vatérienne\*\*\*)

- un obstacle anatomique du tube digestif : atrésie duodénale ou intestinale, volvulus du grêle sur anomalie de rotation méésentérique,
- une entérocolite ulcéro-nécrosante (prématurés\*\*);
- un iléus méconial (mucoviscidose\*\*\*);
- une maladie de Hirschsprung
- une imperforation anale
- un syndrome du petit côlon gauche ( NN de mère diabétique\*\*)
- ...

– Rouges = sang du tractus digestif

- Sang dégluti
- Hypovitaminose K (M.Hémorragique)
- Oesophagite peptique

– Blancs = alimentaires

- Atrésie de l'œsophage \*\*\*
- Causes ⇔ NRS

# Nourrisson

- Causes
  - Aigues
    - Chirurgicales
    - Médicales
  - Chroniques
    - Chirurgicales
    - Médicales

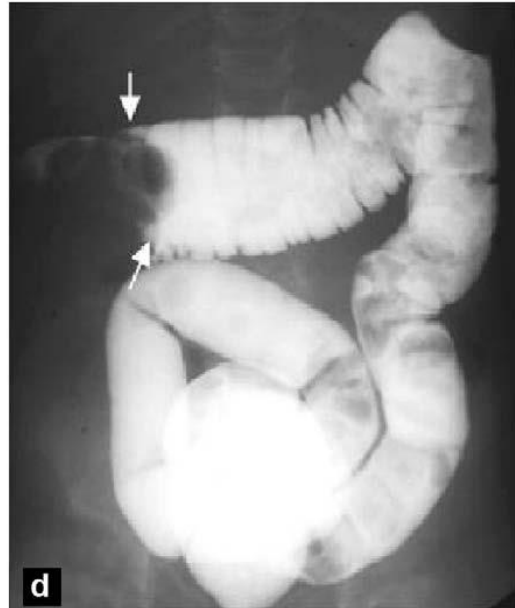
# Nourrisson:

## *Vomissements Aigus*

- Causes médicales
  - Erreur diététique: « forcing » alimentaire, suralimentation, excès de farine...
  - Infections (virales, bactériennes): toutes !!!
  - Intoxications médicamenteuses
  - ...

- Causes chirurgicales
  - IIA \*\*\*
  - Torsions
  - Appendicite
  - ...





# Nourrisson:

## *Vomissements Chroniques*

- Causes médicales
  - RGO\*\*\*
  - Infections ...
  - HIC
  - APLV, M.Coeliaque
  - Métabolique
    - Atteinte rénale
    - HCSurrénales: Sd de perte de sel /déficit en 21 hydroxylase = déshydratation, dénutrition, ambiguïté sexuelle  
Biologie:hypoglycémie, hypoNa, hyper K, 17 OH Progestérone: ↗↗↗  
TRT: **symptomatique + CTC** (+/- Minérallo.)
    - M.Métaboliques: [ ] libre, ATCD famille...(Galactosémie, fructosémie...)

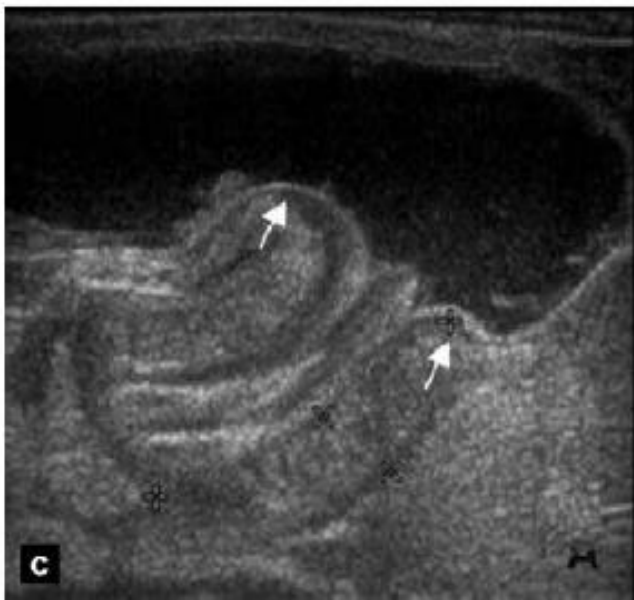
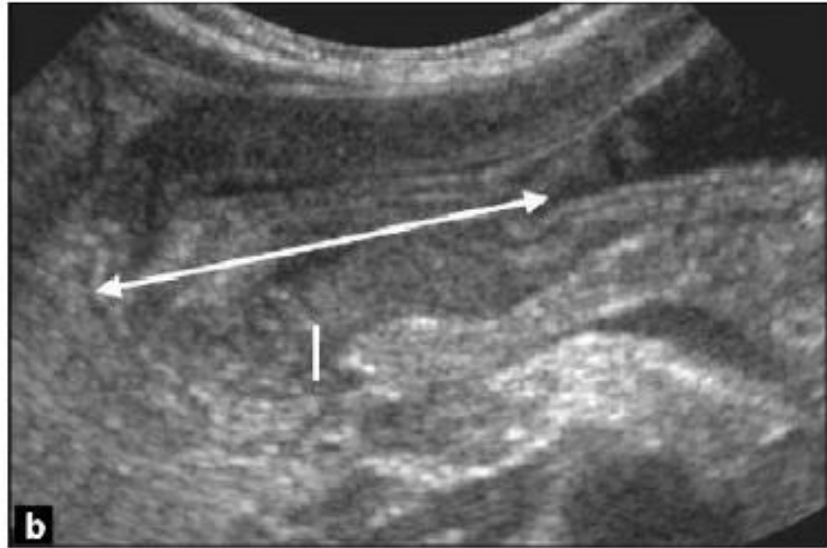
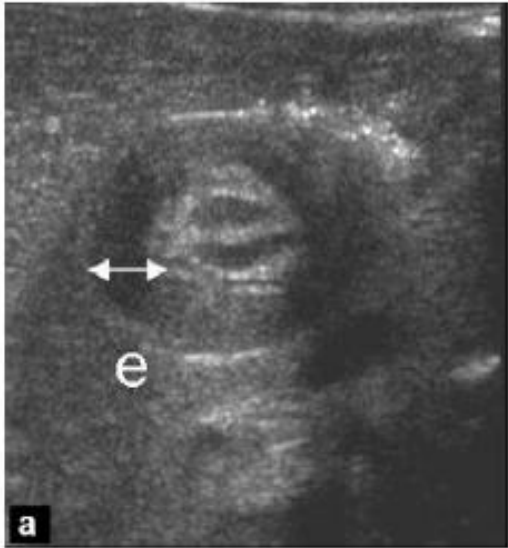
- Causes chirurgicales

- S.H.Pylore = vomissements:

- Post-prandiaux tardifs, lait caillé
    - en jet
    - intervalle libre après la naissance
    - Age: 2 semaines → 2mois
    - Garçon
    - Déhydraté, dénutri
    - DGC:Echo
    - TRT: Rééquilibration – Chirurgie- Renutrition

OCCLUSION

RGO COMPLIQUE



# Enfant

- Causes
  - Aigues
    - Chirurgicales
    - Médicales
  - Chroniques
    - Chirurgicales
    - Médicales

# Enfant

## *Vomissements Aigus*

Idem

- Causes Médicales
- Causes Chirurgicales

# Enfant

## *Vomissements Chroniques*

- Causes Médicales: idem, avec:
  - HIC
  - V.Acétonémiques:
  - V.Cycliques:
  - V.Psychogènes : généralement isolés, ils expriment souvent un trouble de la relation mère-enfant.

- Causes chirurgicales....



## Red Flags

Following are the red flag signs that mandate immediate in-patient evaluation of the underlying cause and appropriate therapy:

- Syst. { i. Unstable vital signs – tachycardia, hypotension or hypertension, respiratory distress, high grade fever
- ii. Acidotic breathing
- Dig. { iii. Presence of bile or blood in the vomitus
- iv. Features of GI obstruction
- Neuro { v. Encephalopathy
- vi. Papilledema



# Examens paracliniques

## 1. Biologie

- Ionogramme
- pH sanguin
- Bilan inflammatoire (NFS, CRP) si cause infectieuse.
- Chimie urinaire (acido-cétose diabétique, infection urinaire..)

## 2. **ASP** syndrome occlusif radiologique\*\*\*

## 3. **Échographie abdominale**, si suspicion chirurgicales.

## 4. **Scanner abdominal**, parfois.

# Traitement

- Hygiéno-diététique\*\*\*
- Médicamenteux: après avoir éliminé une urgence chir.; et après avoir reconnu la cause des vomissements

# Conclusion

- Vomissements: causes diverses, selon stimuli  
CNIT + Gastro, Métabolique ou Psychogène  
(CNIT : Chirurgie, Neurologie, Infection, Toxique)
- Enquête étiologique guidée par:
  - L'âge
  - La sémiologie des vomissements
  - Leur évolution
- TRT: étiologique +/- symptomatique

# Sévérité selon le mécanisme

<b>Force</b>	<b>Cause</b>	<b>Example</b>
None	Esophageal emptying	Achalasia; some reflux
Minimal	Regurgitation	Regurgitant reflux; rumination
Moderate	Vomiting	Most vomiting diseases
Severe	Projectile vomiting with retching	Obstructions; metabolic; poisons

**TABLE 12.2 Differential Diagnosis of Vomiting by Anatomic Locus of Stimulus**

**I. Stimulation of Supramedullary Receptors**

- A. Psychogenic vomiting
- B. Increased intracranial pressure (subdural effusion or hematoma, cerebral edema or tumor, hydrocephalus, meningoencephalitis, Reye syndrome)
- C. Vascular (migraine, severe hypertension)
- D. Seizures
- E. Vestibular disease, "motion sickness"

**II. Stimulation of Chemoreceptive Trigger Zone**

- A. Drugs: opiates, ipecac, digoxin, anticonvulsants
- B. Toxins
- C. Metabolic products (acidemia, ketonemia, hyperammonemia, uremia, etc.):
  - Acidemia, ketonemia (diabetic ketoacidosis, lactic acidosis, phenylketonuria, renal tubular acidosis)
  - Aminoacidemia (tyrosinemia, hypervalinemia, hyperglycinemia, lysinuria, maple syrup urine disease)
  - Organic acidemia (methylmalonic acidemia, propionic acidemia, isovaleric acidemia)
  - Hyperammonemia (urea cycle defects, Reye syndrome)
  - Uremia (renal failure)
  - Other (hereditary fructose intolerance, galactosemia, fatty acid oxidation disorders, diabetes insipidus, adrenal insufficiency, hypercalcemia, hypervitaminosis A)

**III. Stimulation of Peripheral Receptors and/or Obstruction of the Gastrointestinal Tract**

- A. Pharyngeal: gag reflex (sinusitis secretions, post-tussive, self-induced, rumination)
- B. Esophageal:
  - Functional: reflux, achalasia, other esophageal dysmotility
  - Structural: stricture, ring, atresia, etc.
- C. Gastric:
  - Peptic ulcer disease (including Zollinger-Ellison syndrome), infection, dysmotility/gastroparesis
  - Obstruction (e.g., bezoar, pyloric stenosis, web, chronic granulomatous disease, eosinophilic gastroenteritis)
- D. Intestinal:
  - Infection, enteritis, enterotoxin, appendicitis
  - Dysmotility (e.g., metabolic or diabetic neuropathy; intestinal pseudoobstruction)
  - Nutrient intolerance (e.g., cow's milk, soy, gluten, eosinophilic enteropathy)
  - Obstruction (e.g., atresia, web, stenosis, adhesions, bands, volvulus, intussusception, superior mesenteric artery syndrome, duplication, meconium plug, meconium ileus, Hirschsprung disease, distal intestinal obstruction syndrome in cystic fibrosis)
- E. Hepatobiliary, pancreatic: hepatitis, cholecystitis, pancreatitis, cholelithiasis
- F. Cardiac: intestinal ischemia
- G. Renal: pyelonephritis, hydronephrosis, renal calculi, glomerulonephritis
- H. Respiratory: pneumonia, otitis, pharyngitis, sinusitis, common cold
- I. Miscellaneous: peritonitis, sepsis, pregnancy; improper feeding techniques



# Pediatrics in Review

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## **Vomiting in Children**

T. Matthew Shields and Jenifer R. Lightdale

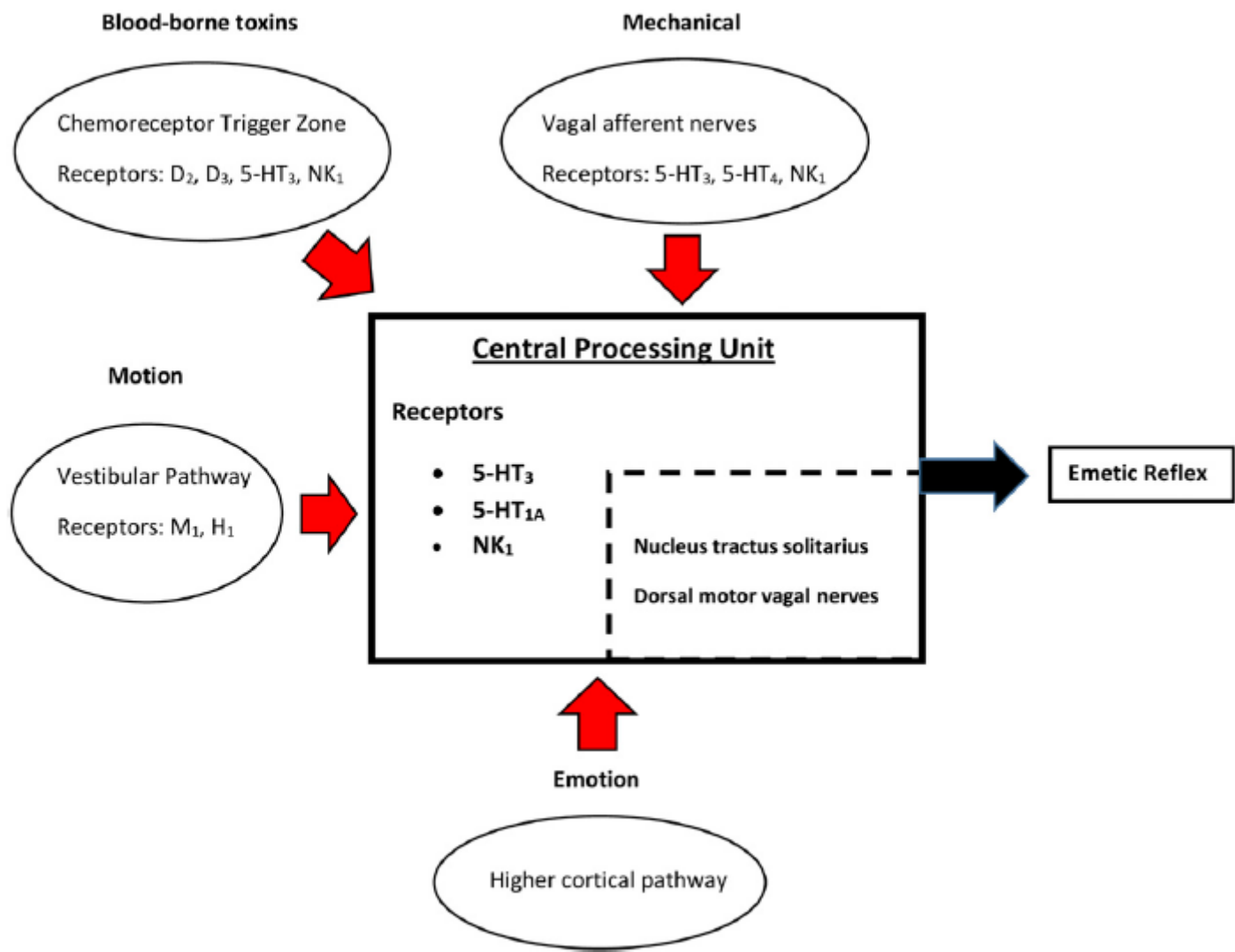
*Pediatrics in Review* 2018;39:342

DOI: 10.1542/pir.2017-0053

## Education Gaps

1. There are at least 4 known physiologic pathways that can trigger vomiting, 3 of which are extraintestinal.
2. Understanding which pathway is causing a patient's vomiting will help determine best treatment options, including which antiemetic is most likely to be helpful to mitigate symptoms.
3. Bilious emesis in a newborn should indicate bowel obstruction.
4. Cyclic episodes of vomiting may be indicative of a migraine variant.





## Objectives

After completing this article, readers should be able to:

1. Understand the main pathways that trigger vomiting via the emetic reflex.
2. Differentiate among acute, chronic, and cyclic causes of vomiting.
3. Create a broad differential diagnosis for vomiting based on a patient's history, physical examination findings, and age.
4. Recognize red flag signs and symptoms of vomiting that require emergent evaluation.
5. Recognize when to begin an antiemetic medication.
6. Select antiemetic medications according to the presumed underlying mechanism of vomiting.

TABLE 2. Causes of Vomiting by Age and Temporal Pattern

PATTERN	AGE				
	0-1 MO	1-12 MO	1-4 Y	5-11 Y	12-18 Y
Acute	<ul style="list-style-type: none"> <li>- FPIES</li> <li>- Hirschsprung disease</li> <li>- Intestinal atresia</li> <li>- Meningitis</li> <li>- Pyloric stenosis</li> <li>- Sepsis</li> </ul>	<ul style="list-style-type: none"> <li>- Foreign body</li> <li>- FPIES</li> <li>- Gastroenteritis</li> <li>- Intussusception</li> <li>- UTI</li> </ul>	<ul style="list-style-type: none"> <li>- Foreign body</li> <li>- Gastroenteritis</li> <li>- Pharyngitis</li> <li>- Toxic ingestion</li> <li>- UTI</li> <li>- Constipation</li> </ul>	<ul style="list-style-type: none"> <li>- Appendicitis</li> <li>- Diabetic ketoacidosis</li> <li>- Pancreatitis</li> </ul>	<ul style="list-style-type: none"> <li>- Choledocholithiasis</li> <li>- Diabetic ketoacidosis</li> <li>- Drug overdose</li> </ul>
Chronic	<ul style="list-style-type: none"> <li>- Adrenal insufficiency</li> <li>- GERD</li> <li>- Hirschsprung disease</li> <li>- Intestinal atresia</li> </ul>	<ul style="list-style-type: none"> <li>- GERD</li> </ul>	<ul style="list-style-type: none"> <li>- Celiac disease</li> <li>- Eosinophilic esophagitis</li> </ul>	<ul style="list-style-type: none"> <li>- Celiac disease</li> <li>- Eosinophilic esophagitis</li> <li>- Gastritis +/- <i>Helicobacter pylori</i></li> <li>- Gastroparesis</li> <li>- PUD</li> </ul>	<ul style="list-style-type: none"> <li>- Bezoar</li> <li>- CHS/marijuana use</li> <li>- Pregnancy</li> </ul>
Cyclic	<ul style="list-style-type: none"> <li>- Adrenal insufficiency</li> <li>- IEMs</li> <li>- Malrotation with volvulus</li> </ul>	<ul style="list-style-type: none"> <li>- Adrenal insufficiency</li> <li>- IEMs</li> <li>- Intussusception</li> <li>- Malrotation with volvulus</li> </ul>	<ul style="list-style-type: none"> <li>- Adrenal insufficiency</li> <li>- Constipation</li> </ul>	<ul style="list-style-type: none"> <li>- Abdominal migraine</li> <li>- Cyclic vomiting syndrome</li> <li>- UPJ obstruction</li> </ul>	<ul style="list-style-type: none"> <li>- Abdominal migraine</li> <li>- CHS/marijuana use</li> <li>- Cyclic vomiting syndrome</li> <li>- Eating disorder</li> <li>- SMA syndrome</li> <li>- UPJ obstruction</li> </ul>

CHS=cannabinoid hyperemesis syndrome, FPIES=food protein-induced enterocolitis syndrome, GERD=gastroesophageal reflux disease, IEM=inborn error of metabolism, PUD=peptic ulcer disease, SMA=superior mesenteric artery, UPJ=ureteropelvic junction, UTI=urinary tract infection.

**TABLE 3. Laboratory and Radiologic Evaluation for Patients with Vomiting by Temporal Pattern**

<b>ACUTE</b>	<b>CHRONIC</b>	<b>CYCLIC</b>
Electrolytes (Na <sup>+</sup> , K <sup>+</sup> , Cl <sup>-</sup> )	Electrolytes (Na <sup>+</sup> , K <sup>+</sup> , Cl <sup>-</sup> )	Electrolytes (Na <sup>+</sup> , K <sup>+</sup> , Cl <sup>-</sup> )
BUN	BUN	BUN
Creatinine	Creatinine	Creatinine
Abdominal radiograph	Celiac screen	Glucose
	Amylase	Upper GI series
	Lipase	Serum amino acids
	Urine $\beta$ -HCG	Urine organic acids
	Hepatic function panel	Urine ketones
	Stool <i>Helicobacter pylori</i> antigen	Carnitine profile
	Upper endoscopy	Ammonia
	MRI brain/CT head	Lactate
		Pyruvate
		US abdomen

BUN=blood urea nitrogen, CT=computed tomographic, GI=gastrointestinal, HCG=human chorionic gonadotropin, MRI=magnetic resonance imaging, US=ultrasonography.

**TABLE 4. Antiemetic Medications and Their Dosages and Target Receptors**

MEDICATION	DOSE	RECEPTOR	NOTES
Ondansetron	0.3–0.4 mg/kg per dose q 4–6 h	5-HT <sub>3</sub>	Diarhea is an adverse effect
Granisetron	40 µg/kg/dose q 12 h	5-HT <sub>3</sub>	
Ginger	250 mg TID	5-HT <sub>3</sub> (?)	The mechanism of action of ginger is not completely understood
Cyproheptadine	0.25–0.5 mg/kg per day	5-HT <sub>2A</sub> , 5-HT <sub>2B</sub> , H <sub>1</sub>	Stimulates appetite
Amitriptyline	0.25 mg/kg per day (max 1 mg/kg per day)	Serotonin	Increased risk of cardiac arrhythmia
Erythromycin	5 mg/kg per dose q 6 h	Motilin	Can increase risk of pyloric stenosis in infants
Diphenhydramine	5 mg/kg per day divided TID or QID	H <sub>1</sub> , D <sub>2</sub>	
Promethazine	0.25–1 mg/kg per dose q 4–6 h	H <sub>1</sub>	Contraindicated in children <2 y old due to respiratory depression
Meclizine	25–50 mg 1 h before travel	H <sub>1</sub>	For patients 12 y and older
Prochlorperazine	5–10 mg q 6–8 h (≥40 kg)	D <sub>1</sub> , D <sub>2</sub>	
Metoclopramide	0.1–0.2 mg/kg per dose q 6–8 h	D <sub>2</sub>	Black box warning: increased risk of tardive dyskinesia
Scopolamine	1 mg transdermal disc applied behind ear q 3 d	M <sub>1</sub>	
Aprepitant	Children 6–30 kg: 3 mg/kg on day 1, then 2 mg/kg on days 2 and 3 Children >30 kg: 125 mg on day 1, then 80 mg on days 2 and 3	NK <sub>1</sub>	Indicated for chemotherapy-induced nausea Causes fatigue, dizziness Not for long-term use

5-HT=5-hydroxytryptamine, q=every, QID=4 times per day, TID=3 times per day.

From Li BUK. Nausea, vomiting, and pyloric stenosis In: Kleinman RE, Goulet O, Meili-Virgani G, et al, eds. Walker's Pediatric Gastrointestinal Disease; adapted from both the 5th (2008) and 6th (2018) editions; used with permission from PMPH USA Ltd, Raleigh, NC.

## Summary

- Vomiting is a common symptom of a myriad of conditions that can cause tremendous stress for the child and caregivers. Finding an etiology can be challenging because vomiting can involve a variety of different organ systems in the body.
- There are 4 main physiologic pathways that can trigger the emetic reflex: mechanical, blood-borne toxins, motion, and emotional triggers. (1) Each pathway is triggered by different organ systems and involves different neurotransmitters.
- Establishing a differential diagnosis for vomiting should take into account both a child's age and temporal characteristics of their vomiting.
- Based on strong research evidence, (1) the first step in management should be correction of dehydration or any electrolyte abnormalities, as well as decompression if there is concern for a bowel obstruction.
- It is critically important to recognize red flag signs and symptoms that may suggest more life-threatening causes of vomiting, including nocturnal vomiting that awakens the patient from sleep, weight loss, hematemesis, severe abdominal distention, mental status changes, and bilious emesis, particularly in a neonate.