# Diarrhoea

# Definition

- **Stool consistency** - increased fluidity of stool
- **Stool frequency** -Three or more bowel movements daily
- **Stool weight** - 200 g daily in Western countries,
  - 300 g when a high-fiber diet is consumed (developing countries)

# Organic/ Functional Diarrhea

- Faecal weight
- Weight loss
- Nocturnal
- Blood in stools
- Onset
- Incontinence
- Dehydration / Electrolyte imbalance

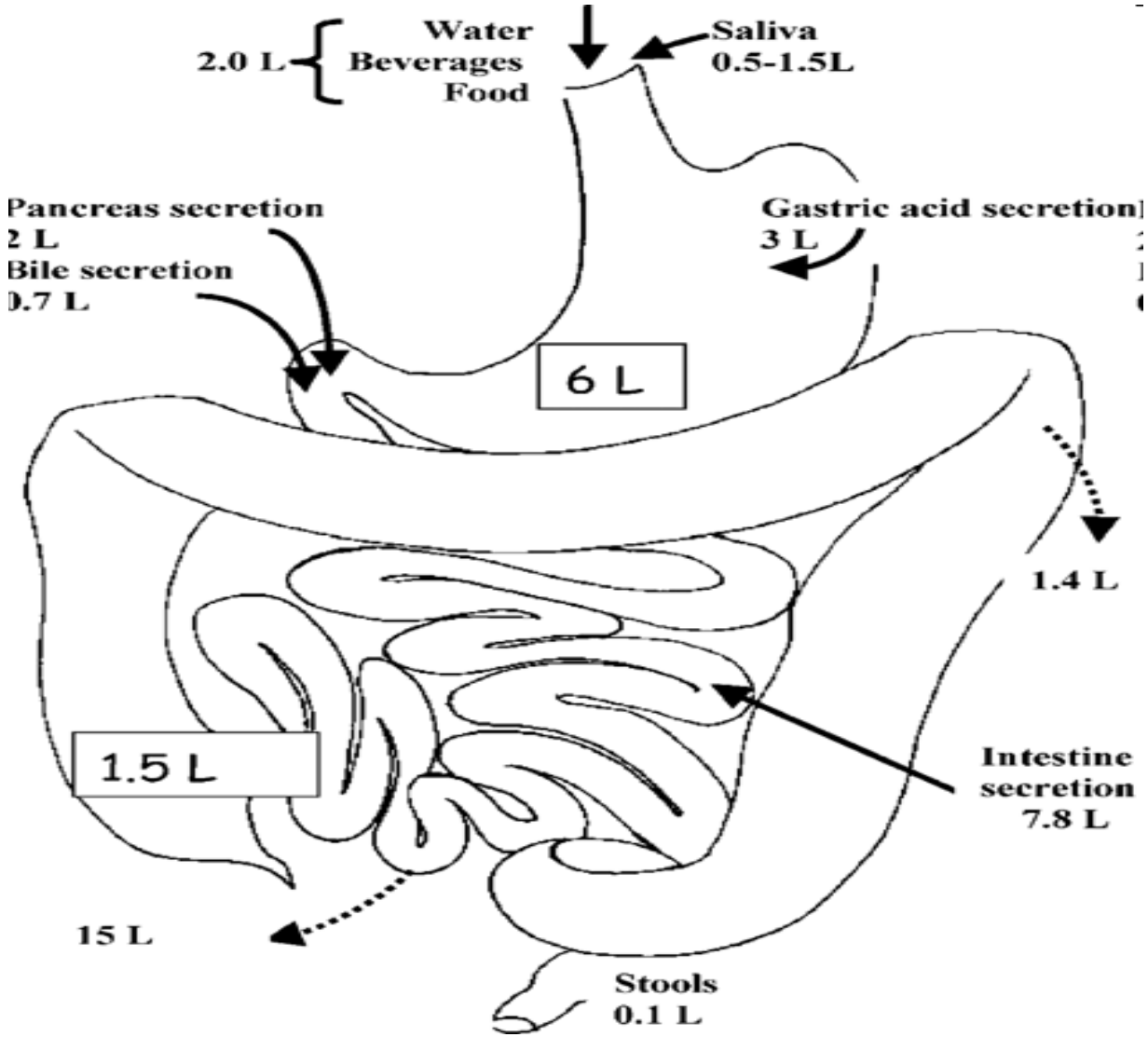
# CLINICAL CLASSIFICATION

- **ACUTE** / **PERSISTANT** / **CHRONIC** DIARRHEA
- **LARGE** BOWEL / **SMALL** BOWEL DIARRHEA
- **WATERY** (OSMOTIC / SECRETORY DIARRHEA )

  **FATTY**

  **INFLAMMATORY DIARRHEA**
- **EPIDEMIOLOGIC** SITUATIONS

# Water flux in GIT



# Small / Large bowel diarrhea

- Volume
- Number
- Site of pain
- Malabsorption
- Blood in stools
- Undigested food particles
- Tenesmus

# Acute Diarrheoa

| | |
|---|---|
| Viral infection | Norovirus, rotavirus |
| Bacterial infection | Salmonella, Campylobacter, Shigella, Escherichia coli, Clostridium difficile |
| Parasitic infection | Giardia, Entamoeba histolytica, Cryptosporidia |
| Food poisoning | Staphylococci, Bacillus cereus, Clostridium perfringens |
| Drugs | Laxatives, Mg-containing antacids, caffeine, antineoplastic drugs, many antibiotics, colchicine, quinine/quinidine, prostaglandin analogs, excipients (eg, lactose) in elixirs |

# Chronic Diarrhea

- *Fatty Diarrhea*

**Malabsorption syndromes**

Mesenteric ischemia
Mucosal diseases (e.g., celiac disease, Whipple's disease)
Short bowel syndrome
Small intestinal bacterial overgrowth

**Maldigestion**

Inadequate luminal bile acid concentration
Pancreatic exocrine insufficiency

- *Inflammatory Diarrhea*

**Diverticulitis**

**Infectious diseases**

Invasive bacterial infections (e.g., tuberculosis, yersiniosis)
Invasive parasitic infections (e.g., amebiasis, strongyloidiasis)
Pseudomembranous colitis (*Clostridium difficile* infection)
Ulcerating viral infections (e.g., cytomegalovirus, herpes simplex virus)

**Inflammatory bowel diseases**

Crohn's disease
Ulcerative colitis
Ulcerative jejunoileitis

**Ischemic colitis**

**Neoplasia**

Colon cancer
Lymphoma

**Radiation colitis**

# *Watery Diarrhea*

- **Osmotic diarrhea**
  Carbohydrate malabsorption
  Osmotic laxatives (e.g., Mg+2, PO4−3, SO4−2)

  **Secretory diarrhea**
  Bacterial toxins
  Congenital syndromes (e.g., congenital chloridorrhea)
  Disordered motility, regulation Diabetic autonomic neuropathy
  Irritable bowel syndrome
  Postsympathectomy diarrhea
  Postvagotomy diarrhea

  **Diverticulitis**
  **Endocrinopathies**
  Addison's disease
  Carcinoid syndrome
  Gastrinoma
  Hyperthyroidism
  Mastocytosis
  Medullary carcinoma of the thyroid
  Pheochromocytoma
  Somatostatinoma
  VIPoma

- **Idiopathic secretory diarrhea**
  Epidemic secretory (Brainerd) diarrhea
  Sporadic idiopathic secretory diarrhea

  **Ileal bile acid malabsorption**

  **Inflammatory bowel disease**
  Crohn's disease
  Microscopic colitis Collagenous colitis
  Lymphocytic colitis
  Ulcerative colitis

  **Laxative abuse** (stimulant laxatives)

  **Medications and toxins**

  **Neoplasia** Colon carcinoma
  Lymphoma
  Villous adenoma in rectum

- **Vasculitis**

# Secretory versus Osmotic Diarrhea

| TYPE OF DIARRHEA | CAUSES | EXAMPLES |
|---|---|---|
| Secretory diarrhea | Exogenous secretagogues | Enterotoxins (e.g., cholera) |
| | Endogenous secretagogues | Neuroendocrine tumors (e.g., carcinoid syndrome) |
| | Absence of ion transporter | Congenital chloridorrhea |
| | Loss of intestinal surface area | Intestinal resection, diffuse intestinal mucosal disease<br>Intestinal ischemia Diffuse mesenteric atherosclerosis |
| | Rapid intestinal transit | Intestinal hurry following vagotomy |
| Osmotic diarrhea | Ingestion of poorly absorbed agent | Magnesium ingestion |
| | Loss of nutrient transporter | Lactase deficiency |

# How to distinguish Secretory versus Osmotic Diarrhea

1. Osmotic diarrhea disappears with fasting or cessation of ingestion of the offending substance.
2. Osmotic gap in stool

# 290 - 2 ( Na+K )

- 290 mOsm/kg, the osmolality of stool in the body

- **A small osmotic gap (<50 mOsm/kg),** which signifies that the osmolality of stool water is attributable mostly to incompletely absorbed electrolytes, is characteristic of **secretory diarrhea**
- **A large osmotic gap (>100 mOsm/kg)** indicates that much of the stool osmolality is composed of nonelectrolytes, is characteristic of an **osmotic diarrhea**

# Fatty diarrhea- Pancreatic / Mucosal

- Consistency
- Volume
- Stool number
- Degree of fat malabsorption /associated fat sol. vitamin def.
- Associated carbohydrate malabsorption

# Likely Causes of Diarrhea in Well-Defined Patient Groups or Settings

- **Travelers**

  Bacterial infection (mostly acute)
  Protozoal infections (e.g., amebiasis, giardiasis)
  Tropical sprue

  **Epidemics and Outbreaks**

  Bacterial infection
  Epidemic idiopathic secretory diarrhea (e.g., Brainerd diarrhea)
  Protozoal infection (e.g., cryptosporidiosis)
  Viral infection (e.g., rotavirus)

  **Diabetic Patients**

  Altered motility (increased or decreased)
  Associated diseases Celiac disease
  Pancreatic exocrine insufficiency
  Small intestinal bacterial overgrowth

  Drug side effects (especially acarbose, metformin)

- **Patients with Acquired Immunodeficiency Syndrome**

  Drug side effects
  Lymphoma
  Opportunistic infections (e.g., cryptosporidiosis, cytomegalovirus, herpes virus, *Mycobacterium avium* complex)

  **Institutionalized and Hospitalized Patients**

  *Clostridium difficile* toxin–mediated colitis
  Drug side effects
  Fecal impaction with overflow diarrhea
  Ischemic colitis
  Tube feeding

# Medications and Toxins Associated with Diarrhea

Acid-reducing agents ( H2 receptor antagonists, proton pump inhibitors)
Antacids (e.g., those that contain magnesium)
Antiarrhythmics (e.g., quinidine)
Antibiotics (most)
Anti-inflammatory agents (e.g.,5-aminosalicylates, gold, NSAIDs)
Antihypertensives (e.g., β-adrenergic blocking drugs)
Antineoplastic agents (many)
Antiretroviral agents
Colchicine
Heavy metals
Herbal products
Prostaglandin analogs (e.g., misoprostol)
Theophylline
Vitamin and mineral supplements

# CONSTIPATION

# Constipation

- Definition : varies among physicians and other health care providers.
- Three or fewer bowel movements/week

# Constipation

- Primary/ Functional
- Secondary

# Secondary Causes of Constipation

- **Mechanical Obstruction**
  Anal stenosis
  Colorectal cancer
  Extrinsic compression
  Rectocele or sigmoidocele
  Stricture

**Medications**

Antacids
Anticholinergic agents (e.g., antiparkinsonian drugs, antipsychotics, antispasmodics, tricyclic antidepressants)
Anticonvulsants (e.g., carbamazepine, phenobarbital, phenytoin)
Antineoplastic agents (e.g., vinca derivatives)
Calcium channel blockers (e.g., verapamil)
Diuretics (e.g., furosemide)
5-Hydroxytryptamine3 antagonists (e.g., alosetron)
Iron supplements
Nonsteroidal anti-inflammatory drugs (e.g., ibuprofen)
Mu-opioid agonists (e.g., fentanyl, loperamide, morphine)

- **Metabolic and Endocrinologic Disorders**
  Diabetes mellitus
  Heavy metal poisoning (e.g., arsenic, lead, mercury)
  Hypercalcemia
  Hyperthyroidism
  Hypokalemia
  Hypothyroidism
  Panhypopituitarism
  Pheochromocytoma
  Porphyria
  Pregnancy

**Neurologic and Myopathic Disorders**

Amyloidosis
Autonomic neuropathy
Chagas' disease
Dermatomyositis
Intestinal pseudo-obstruction
Multiple sclerosis
Parkinsonism
Progressive systemic sclerosis
Shy-Drager syndrome
Spinal cord injury
Stroke

# Rome III Criteria for Functional Constipation

**≥2 / 6 must be present***:

- Straining during at least 25% of defecations
- Lumpy or hard stools in at least 25% of defecations
- Sensation of incomplete evacuation for at least 25% of defecations
- Sensation of anorectal obstruction/blockage for at least 25% of defecations
- Manual maneuvers to facilitate at least 25% of defecations (e.g., digital evacuation, support of the pelvic floor)
- Fewer than three defecations/wk

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* Criteria fulfilled for the previous 3 months with symptom onset at least 6 months prior to diagnosis.

# Clinical Classification of Functional Constipation

| CATEGORY | FEATURES | CHARACTERISTIC FINDINGS |
|---|---|---|
| **Normal-transit constipation** | Incomplete evacuation; abdominal pain may be present but not a predominant feature | Normal physiologic test results |
| **Slow-transit constipation** | Infrequent stools (e.g., ≤1/wk); lack of urge to defecate; poor response to fiber and laxatives; generalized symptoms, including malaise and fatigue; more prevalent in young women | Retention in colon of >20% of radiopaque markers five days after ingestion |
| **Defecatory disorders (pelvic floor dysfunction, anismus, descending perineum syndrome, rectal prolapse)** | Frequent straining; incomplete evacuation; need for manual maneuvers to facilitate defecation | Abnormal balloon expulsion test and/or rectal manometry |