

Team Medicine

CHRONIC DIARRHEA

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DIARRHEA

is a common and usually transient symptom
 Characterize by decrease stools consistency

Chronic diarrhea (**liquid stools lasting more than four weeks**) may occur in up to 5% of the population in any given year.

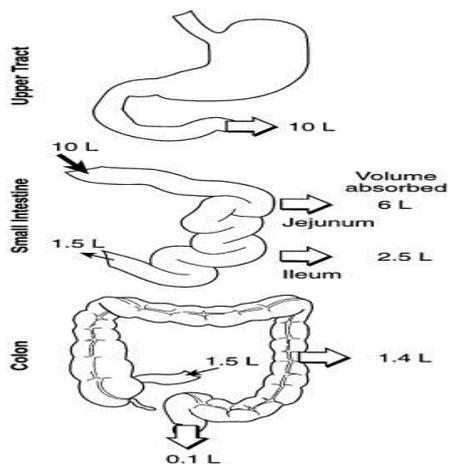
(weight of stool and frequency are not reliable)

Diarrhea is a symptom, not a disease and may occur in many different conditions

| NORMAL | ABNORMAL |
|---|---|
| <p>The gut absorbs most of the fluid that it secretes, and its motility provides a favorable milieu for water, electrolyte, and nutrient absorption</p> | <p>When infectious agents, toxins, or other noxious substances are present within the gut → fluid secretion and motility are stimulated to expel the unwanted material, thereby producing diarrhea</p> <p>This protective response is valuable acutely but, when chronic, is inappropriate and no longer serves an adaptive purpose</p> |

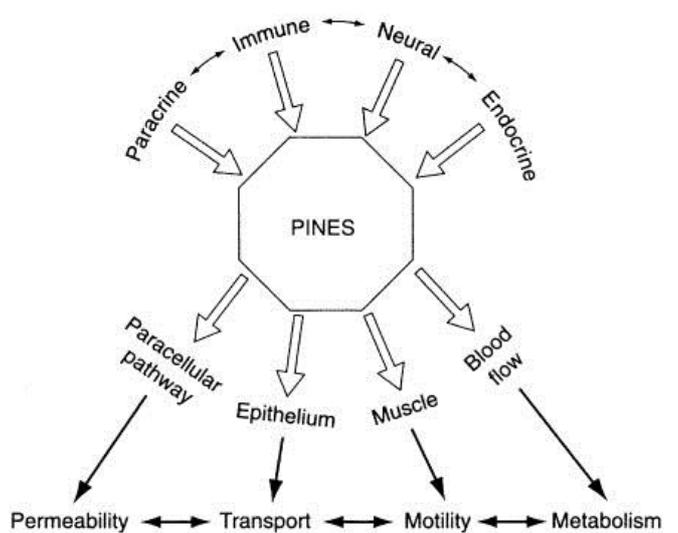
Epithelial and **motor functions** are altered in a coordinated fashion to produce diarrhea

Fluid loads along the gastrointestinal tract



“PINES” regulatory system in the intestine

At epithelial level



CLASSIFICATION

By time course (**acute vs. chronic**)
 volume (**large vs. small**)
 Pathophysiology (**secretory vs. osmotic**)
 Stool characteristics (**watery vs. fatty vs. inflammatory**).
 Epidemiology (**epidemic vs. travel-related vs. immunosuppression-related**)

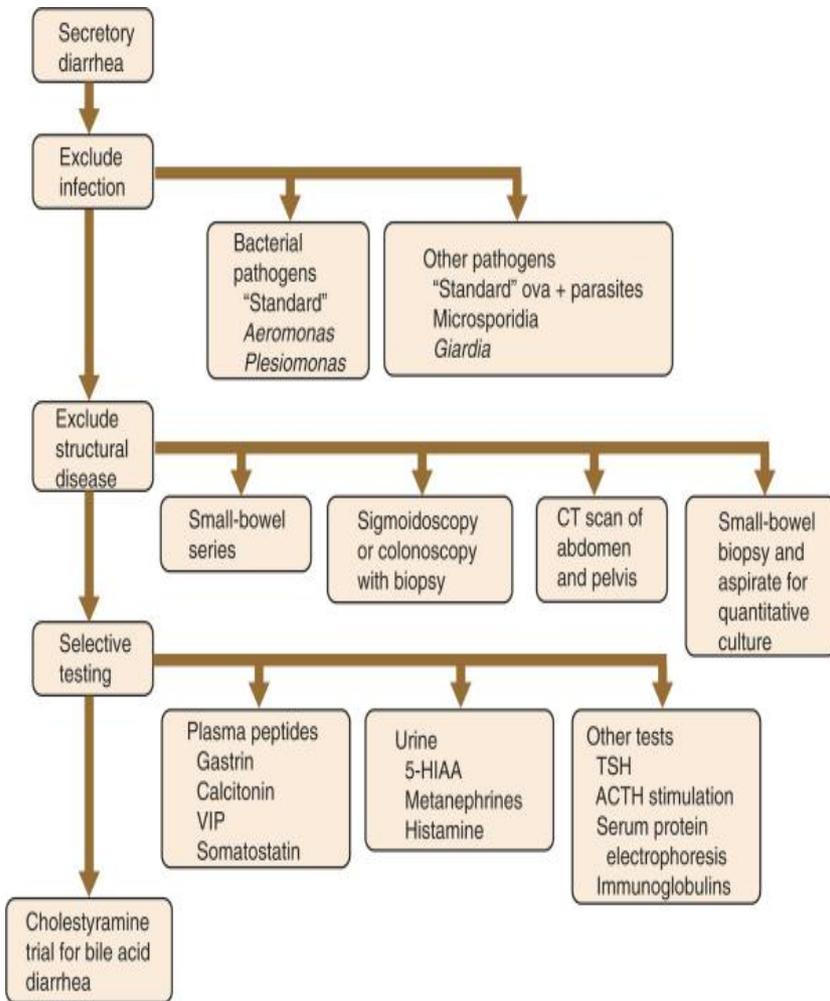
no single scheme is perfect; the experienced physician uses all of these classifications to expedite patient care

| MECHANISM | 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 surface area | Intestinal resection, diffuse mucosal disease |
| | Intestinal ischemia | Chronic mesenteric ischemia |
| | Rapid intestinal transit | Intestinal hurry following vagotomy |
| Osmotic diarrhea | Ingestion of a poorly absorbed agent | Magnesium ingestion |
| | Loss of a nutrient transporter | Lactase deficiency |

Most of diarrhea are **secretory** usually come with infection, endocrine and others (DOCTOR NOTE)

The most severe symptoms in many patients is urgency of defecation. And **fecal incontinence is a common event in acute and chronic diarrhea** Davidson {P. 873}

SECRETORY DIARRHEA



Laxative abuse (non-osmotic laxatives)
Post-cholecystectomy (from bile salts)

- Congenital syndromes (chloridorrhea)
- Bacterial toxins
- Ileal bile acid malabsorption

Inflammatory bowel disease

Ulcerative colitis
 Crohn's disease

Microscopic (lymphocytic) colitis

Collagenous colitis

Vasculitis

Drugs and poisons

Disordered motility

Post-vagotomy diarrhea

Post-sympathectomy diarrhea

Diabetic autonomic neuropathy

Hyperthyroidism

Irritable bowel syndrome

Neuroendocrine tumors

Gastrinoma

VIPoma

Somatostatinoma

Mastocytosis

Carcinoid syndrome

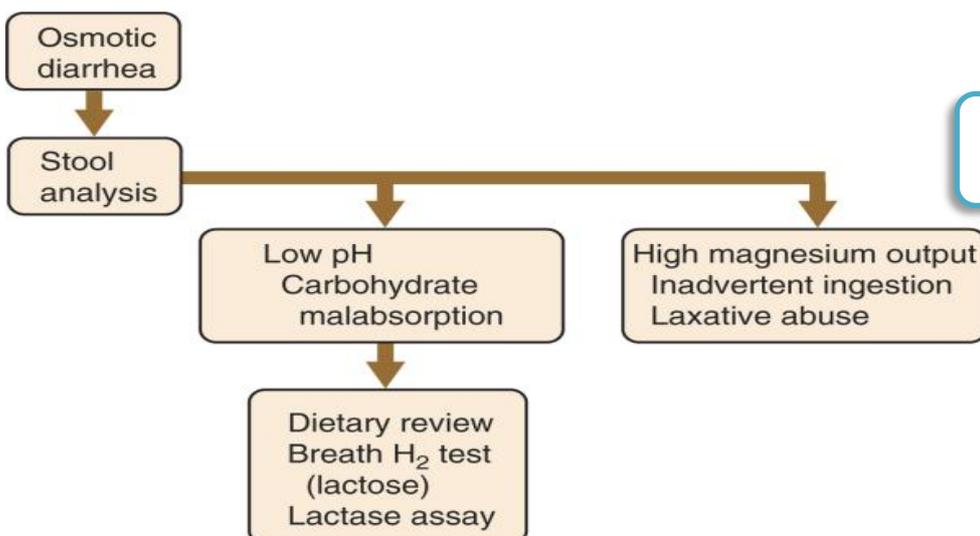
Medullary carcinoma of thyroid

Neoplasia

Colon carcinoma

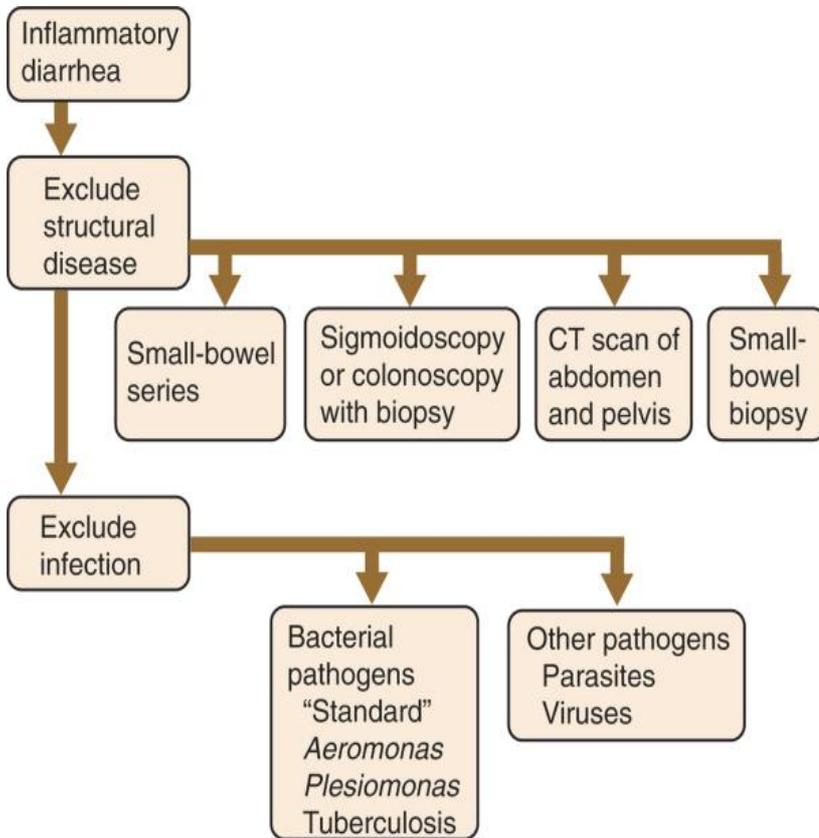
Lymphoma

OSMOTIC DIARRHEA



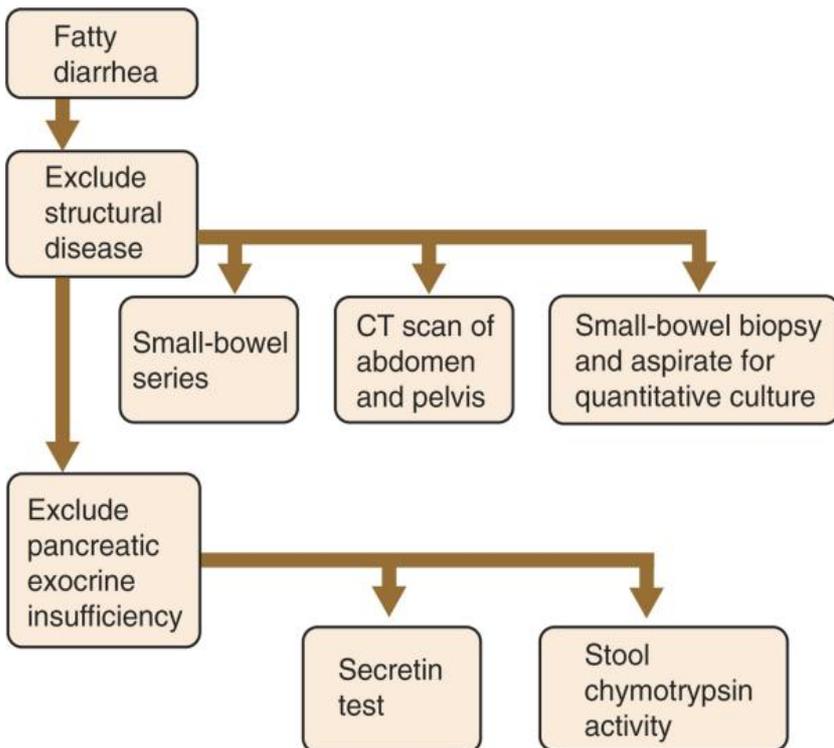
Most of them because taking high laxative volume (DOCTOR NOTE)

INFLAMMATORY DIARRHEA



- Inflammatory bowel disease
 - Ulcerative colitis
 - Crohn's disease
- Infectious diseases
 - Pseudomembranous colitis
 - Tuberculosis, yersinosis
 - Amebiasis/other
 - Invasive parasites
- Ischemic colitis
- Radiation colitis
- Neoplasia
 - Colon cancer
 - Lymphoma

FATTY DIARRHEA



- Fatty diarrhea
- Malabsorption syndromes
 - Mucosal diseases
- Short bowel syndrome
 - Postresection diarrhea
 - Small bowel bacterial overgrowth
- Mesenteric ischemia
- Maldigestion
 - Pancreatic exocrine insufficiency
 - Inadequate luminal bile acid

Most of acute diarrhea is due to **INFECTIOUS** cause while chronic is due to **NON-INFECTIOUS** cause

Chronic diarrhea may be caused by infectious such as in AIDS

The most step in approach patient with diarrhea is **HISTORY**
 ✓ (DOCTOR NOTE)

COMMON CAUSES OF DIARRHEA

DEVELOPING COUNTRIES

Infection cause is common

- Chronic bacterial
- Mycobacterial
- Parasitic infections

Then

- Functional disorders,
- Malabsorption
- Inflammatory bowel disease

DEVELOPED COUNTRIES

✓ **IRRITABLE BOWEL SYNDROME (IBS)** *common

Inflammatory bowel disease (IBD)
 Malabsorption syndromes (such as lactose intolerance and celiac disease)
 Chronic infections (particularly in patients who are immunocompromised)

Likely cause of diarrhea in certain epidemiologic classifications:

- Travelers: bacterial, protozoal, tropical sprue
- Diabetics patients > they can have neuropathy that can lead to diarrhea
- AIDS patients infections ,drugs
- Hospitalized patients :drugs, infections, ischemia , C.D toxin

Any thing that effect the integrity of the bowel will lead to diarrhea (Doctor note)

Viral infections (**rotavirus and the Norwalk virus**) are the most common cause for acute diarrhea.
 Step up to medicine {P. 446}

In AIDS patients (**mycobacterium avium-intracellular, Cryptosporidium, cyclospora, or CMV**) are the most common cause

Step up to medicine {P. 446}

APPROACH TO PATIENT WITH DIARRHEA

- **HISTORY**
- **PHYSICAL EXAMINATION**
- **LABORATORY TESTS**
- **RADIOLOGY**
- **ENDOSCOPY**

History

- ✓ What led the patient to complain of diarrhea? (eg, consistency or frequency of stools, the presence of urgency or fecal soiling)
- ✓ Stool characteristics: (eg, greasy stools that float and are malodorous may suggest fat malabsorption while the presence of visible blood may suggest inflammatory bowel disease)
- ✓ The volume of the diarrhea: (eg, voluminous watery diarrhea is more likely to be due to a disorder in the small bowel while small-volume frequent diarrhea is more likely to be due to disorders of the colon)
- ✓ Duration of symptoms, nature of onset (sudden or gradual)
- ✓ Weight loss, appetite (common associated diarrhea)
- ✓ Occurrence of diarrhea during fasting or at night (suggesting a secretory diarrhea like > secretory + osmotic)
- ✓ it's come after food or not
- ✓ Systems review :The presence of systemic symptoms:(such as fevers, joint pains, mouth ulcers, eye redness) → IBD, CTD, thyroid
- ✓ Association of symptoms with specific food ingestion (such as dairy products or potential food allergens)
- ✓ A history of recurrent bacterial infections (e.g. sinusitis, pneumonia), which may indicate a primary immunoglobulin deficiency.
- ✓ Epidemiological factors, such as travel before the onset of illness
- ✓ **Family history: IBD ***** important**
- ✓ Drug Hx: including over the counter medication

Physical examination

Nothing specific .. You just have to do a routine examination like any part of GI .. And then think in systemic things + hydration status

- ✓ Rarely provides a specific diagnosis.
- ✓ Findings suggestive of IBD (eg, mouth ulcers, a skin rash, episcleritis, an anal fissure or fistula, the presence of visible or occult blood on digital examination, abdominal masses or abdominal pain)
- ✓ Evidence of malabsorption (wasting, physical signs of anemia, scars indicating prior abdominal surgery)
- ✓ Lymphadenopathy (possibly suggesting HIV infection)
- ✓ Palpation of the thyroid and examination for exophthalmos and lid retraction may provide support for a diagnosis of HYPERTHYROIDISM

Investigations(essential in all)

- ✓ **CBC (to see if he's anemic .. There are many things that can cause diarrhea with anemia " leukopenia + leukocytosis)**
- ✓ **ESR (as a factor of inflammation)**
- ✓ **Electrolytes (especially small bowel)**
- ✓ **Total protein and albumin**
- ✓ **TFT (thyroid function test)**
- ✓ **Stool occult blood**

Specific investigations "The history and physical examination may point toward a specific diagnosis for which testing may be indicated"

MALABSORPTION

PHASES OF ABSORPTION

- **Luminal phase:** dietary fats, proteins, and carbohydrates are hydrolyzed and solubilized by secreted digestive enzymes and bile.
- **Mucosal phase:** relies on the integrity of the brush-border membrane of intestinal epithelial cells to transport digested products from the lumen into the cells.
- **Post absorptive phase:** nutrients are transported via lymphatics and portal circulation from epithelial cells to other parts of the body.

□ Luminal phase

- **Impaired nutrient hydrolysis**

The most common cause is **PANCREATIC INSUFFICIENCY** due to chronic pancreatitis, pancreatic resection, pancreatic cancer, or cystic fibrosis.

- **Inactivation of pancreatic enzymes by gastric hypersecretion**, as seen in Zollinger-Ellison syndrome .

- **Impaired micelle formation**

Impaired micelle formation causes lead to fat malabsorption. This impairment is due to different reasons, including :

- (1) decreased bile salt synthesis from severe parenchymal liver disease (eg, cirrhosis);
- (2) impaired bile secretion from biliary obstruction or cholestatic jaundice (eg, primary biliary cirrhosis, primary sclerosing cholangitis);
- (3) impaired enterohepatic bile circulation, as seen in small bowel resection or regional enteritis;
- (4) bile salt deconjugation due to small bowel bacterial overgrowth.

- **Luminal availability and processing**

Luminal bacterial overgrowth can cause a decrease in the availability of substrates, including carbohydrates, proteins, and vitamins

□ Mucosal phase

- **Impaired brush-border hydrolase activity**
 - ✓ Disaccharides deficiency .
 - ✓ **LACTASE DEFICIENCY** > common problem
 - ✓ Immunoglobulin A (IgA) deficiency
- **Impaired nutrient absorption**
 - ✓ Acquired disorders are far more common and are caused by:
 1. decreased absorptive surface area, as seen in intestinal resection
 2. damaged absorbing surface, as seen **in celiac sprue**, tropical sprue, giardiasis, **Crohn disease**, **AIDS enteropathy**, chemotherapy, or radiation therapy;
 3. infiltrating disease of the intestinal wall, such as **lymphoma** and **amyloidosis**

Post absorptive phase

- **Obstruction** of the lymphatic system, both congenital (eg, intestinal lymphangiectasia)
- **Acquired** (eg, Whipple diseases , lymphoma, tuberculosis),

CLINICAL PRESENTATION

- History :

Diarrhea

Wt Loss

Steatorrhea , Flatulence and abdominal distention ,Edema, anemia,

Metabolic defects of bones

- Physical

General

Patients may have orthostatic hypotension .

Signs of weight loss, muscle wasting, or both may be present .

Patients may have signs of loss of subcutaneous fat

Cheilosis, glossitis, or aphthous ulcers of the mouth.

Abdominal examination

The abdomen may be distended, and bowel sounds may be hyperactive .

Ascites may be present in severe hypoproteinemia

DERMATOLOGICAL MANIFESTATIONS

- ✓ **Pale skin**



Neurological examination

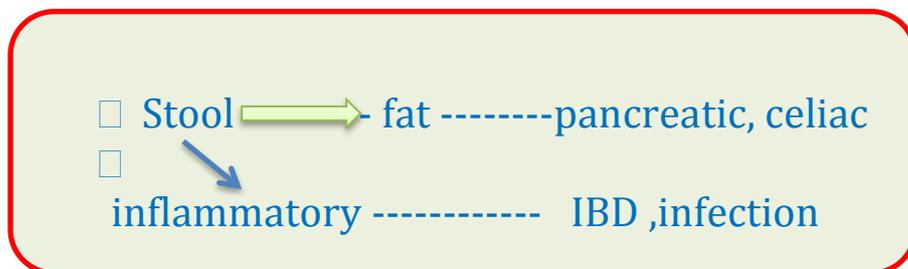
- Motor weakness, peripheral neuropathy, or ataxia may be present .
- The **Chvostek sign** or the Trousseau sign may be evident due to hypocalcemia

LAB STUDIES

- Hematological tests (usually anemia)
 - A CBC
 - Serum iron, vitamin B-12, and folate
 - Prothrombin time.
- Electrolytes and chemistries
 - hypokalemia, hypocalcemia, hypomagnesemia, and **metabolic acidosis** .
 - Protein malabsorption may cause hypoproteinemia and hypoalbuminemia .
 - Fat malabsorption can lead to low serum levels of triglycerides, cholesterol
 - ESR which is elevated in Crohn disease and Whipple disease
- Stool analysis
 - Stool pH may be assessed. Values of <5.6 are consistent with carbohydrate malabsorption
 - Stool C/S
 - Pus cell in the stool e.g IBD

TESTS OF FAT MALABSORPTION

For a quantitative measurement of fat absorption, a 72-hour fecal fat collection
 Qualitative test Sudan III stain of stool , less reliable .



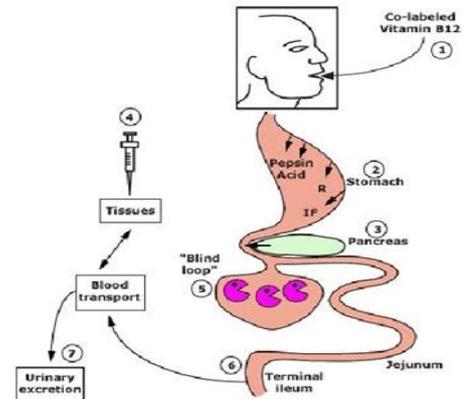
Schilling test (The **Schilling test** is used to determine whether the body absorbs vitamin B12)

Malabsorption of vitamin B-12 may occur as a consequence of deficiency of intrinsic factor (eg, pernicious anemia, gastric resection), pancreatic insufficiency, bacterial overgrowth, ileal resection, or disease .

3 STEPS SCHILLING TEST

1. Oral VIT B12
2. VIT B12 orally +intrinsic factor
3. VIT B12 orally +intrinsic factor+ oral antibiotics

The Schilling test (part one)



Bacterial overgrowth

Bacterial overgrowth cause an early rise in breath hydrogen

JEJUNAL CULTURE

14c D-xylose breath test ,high sensitivity and specificity



Serology

No serologic tests are specific for malabsorption .

Serum Anti-TTG and antiendomysial antibodies **can be used to help diagnose celiac sprue** .

Serum IgA to rule out IgA deficiency

Determination of fecal elastase and chymotrypsin (2 proteases produced by the pancreas) can be used to try to distinguish between pancreatic causes and intestinal causes of malabsorption.

Celiac disease usually diagnosed by serology and biopsy
** Doctor note

Imaging Studies

- o Plain abdominal x-ray film: Pancreatic calcifications are indicative
- o CT scan of the abdomen
- o Small bowel barium studies



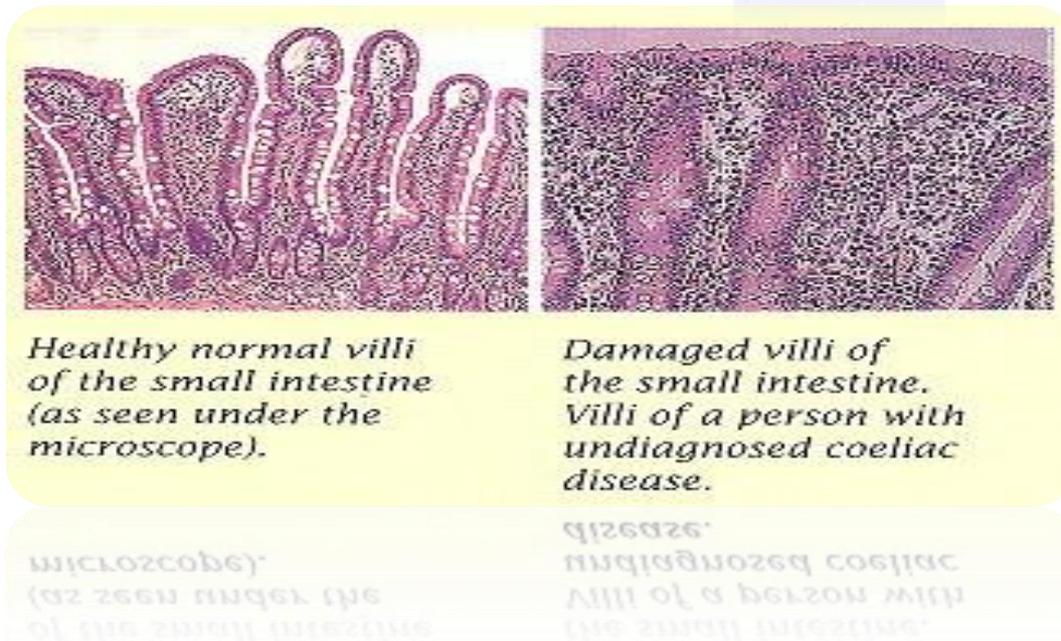
- o (ERCP): pancreatitis



Endoscopy (will guide you where to go)

Upper endoscopy with small bowel mucosal biopsy.... Examples

- ❖ Celiac sprue,
- ❖ Giardiasis
- ❖ Crohn disease,
- ❖ Whipple disease
- ❖ Amyloidosis
- ❖ Lymphoma.



Healthy normal villi of the small intestine (as seen under the microscope).

Damaged villi of the small intestine. Villi of a person with undiagnosed coeliac disease.

TREATMENT OF CAUSATIVE DISEASES

- **A gluten-free diet helps treat celiac disease .**
- **Similarly, a lactose-free diet**
- **Protease and lipase supplements are the therapy for pancreatic insufficiency .**
- Antibiotics are the therapy for bacterial overgrowth .
- Corticosteroids, anti-inflammatory agents, such as **MESALAMINE**, and other therapies are used to treat CD

NUTRITIONAL SUPPORT

- Supplementing various minerals calcium, magnesium, iron, and vitamins
- Caloric and protein replacement also is essential .
- Medium-chain triglycerides can be used for lymphatic obstruction .
- In severe intestinal disease, such as massive resection and extensive regional enteritis, **parenteral nutrition** may become necessary

SUMMARY

- Chronic diarrhea Characterized by liquid stools lasting more than four weeks.
- Most of acute diarrhea is due to INFECTIOUS cause while chronic is due to NON-INFECTIOUS cause.
- IRRITABLE BOWEL SYNDROME (IBS) is the most common cause of chronic diarrhea
- Family history of IBD is an important point to ask when you taking a history
- Steatorrhea is one of the most common clinical presentation in patient with malabsorption.

MCQS

1- The most common symptom of malabsorption (Ex: celiac disease) is:

- A) Acute diarrhea
- B) Acute vomiting
- C) Chronic diarrhea
- D) Chronic vomiting
- E) Abdominal pain
- F) Blood with stool

2- The most common cause of acute diarrhea is:

- A) Infections
- B) Drugs
- C) Irritable bowel disease
- D) Inflammatory bowel disease

1:C, 2:A