

# Abdominal pain in children

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- Acute abdominal pain
- Chronic abdominal pain

- There is considerable variation among children in their perception and tolerance for abdominal pain.
- This is one reason the evaluation of chronic abdominal pain is difficult.

- Two types of nerve fiber transmit painful stimuli
- **A fiber** – mediates sharp localized pain in skin and muscle
- **C fiber**- from viscera, peritoneum and muscle transmit poorly localized dull pain



Visceral pain

Somatic pain

Referred pain

# Visceral pain

Epigastric

Liver, biliary tract, pancreas, stomach, upper bowel

Periumbilical

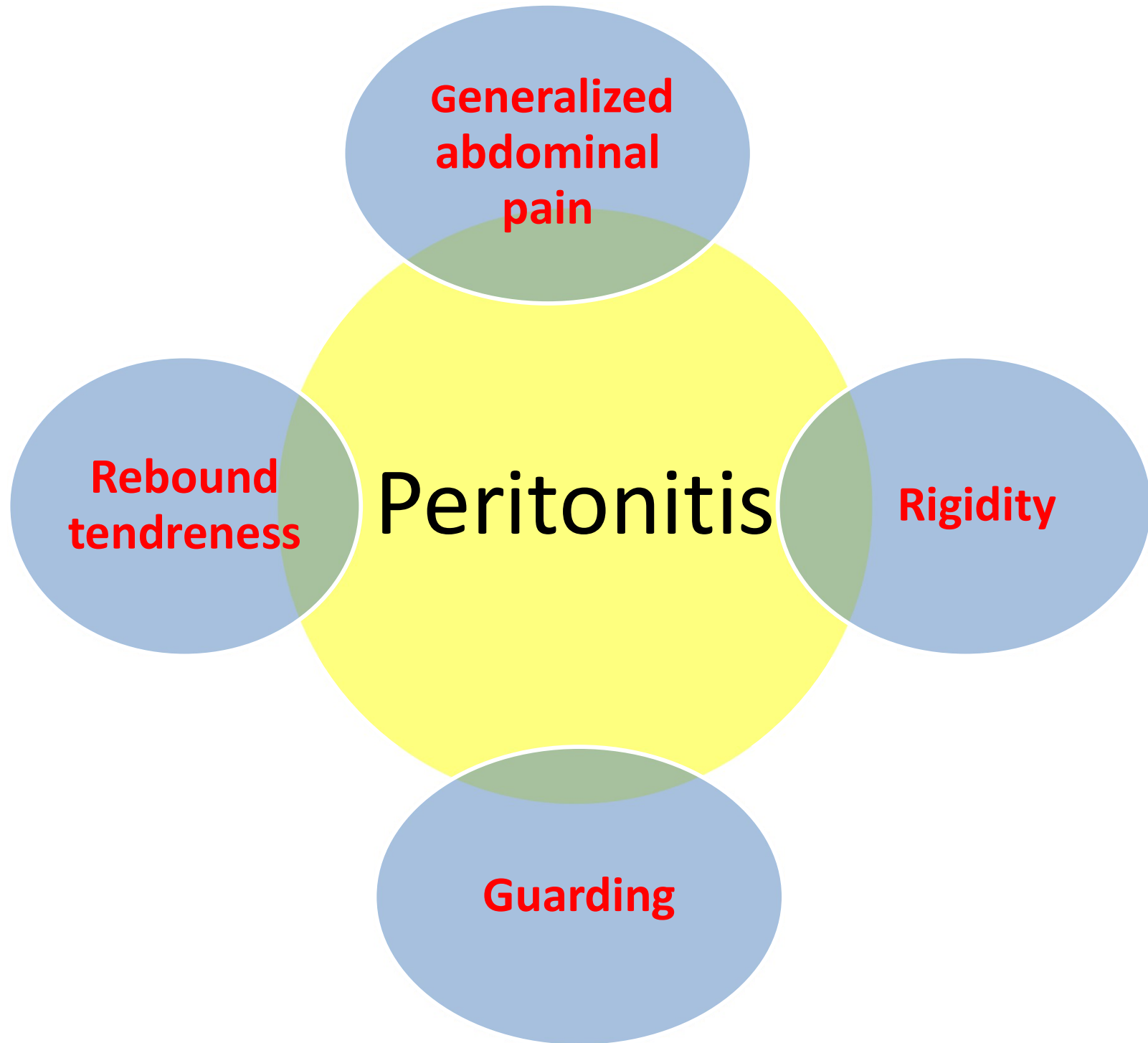
Distal small bowel, cecum, appendix, proximal colon

Hypo gastric

Transverse colon, Distal large bowel, urinary tract, pelvic organ

# Somatic pain

- Intense
- Well localized
- Pain localized to site of inflamed viscus



**Generalized  
abdominal  
pain**

**Rebound  
tenderness**

**Peritonitis**

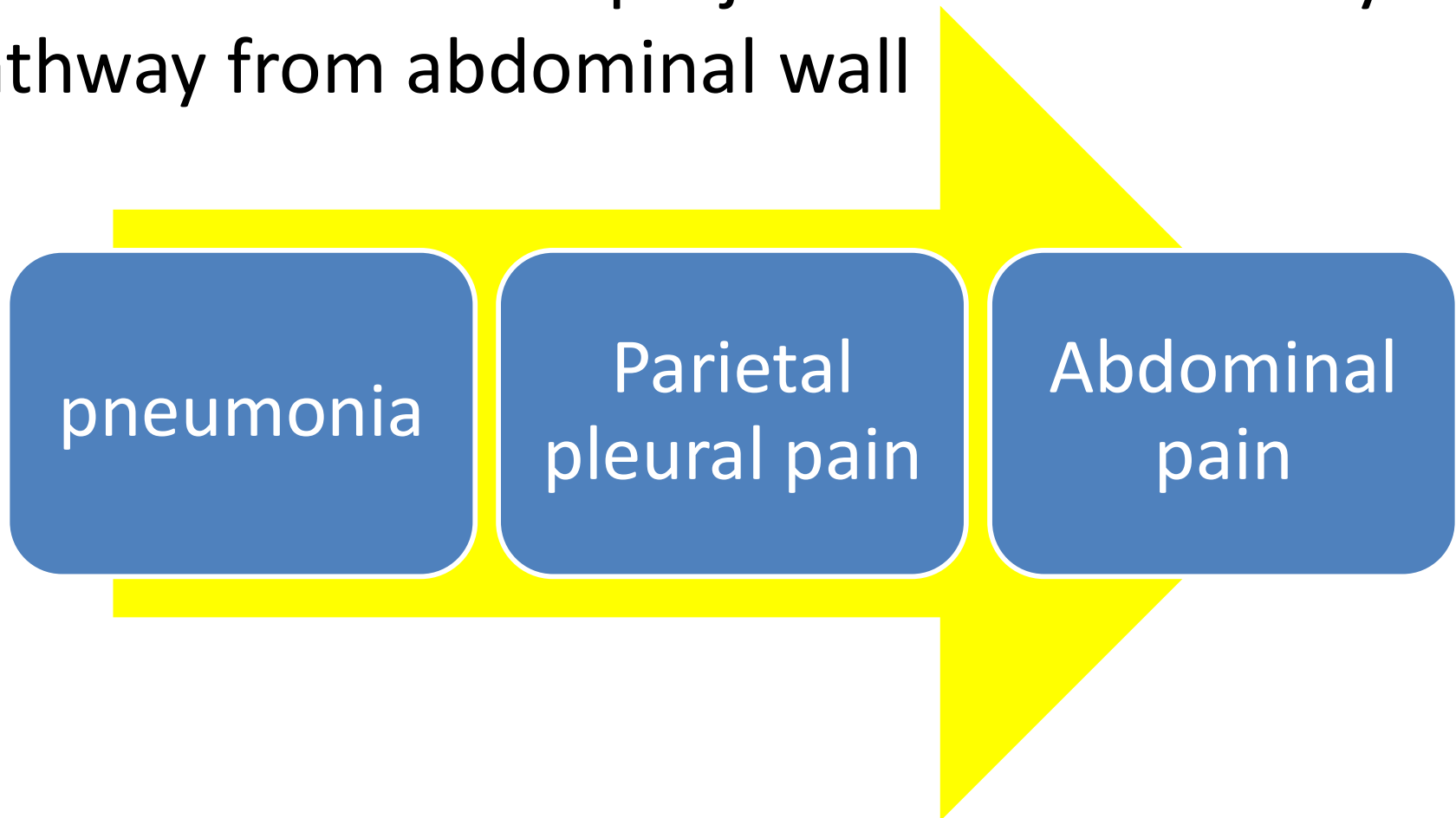
**Rigidity**

**Guarding**

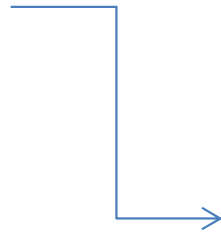


# Referred pain

- From extraintestinal location
- From shared central projection with sensory pathway from abdominal wall



- The likely diagnosis is often suggested by
- Child's age
- Clinical features



Associated symptoms

Past medical history

Physical examination

# Neonate

- Colic
- Dietary protein allergy
- Volvulus
- Necrotizing enterocolitis
- Testicular torsion
- Adhesions

ໄ mo – ໄ y/o

- Gastroenteritis
- Viral illness
- Trauma (including inflicted injury)
- Incarcerated hernia
- Intussusception
- Urinary tract infection
- Foreign body ingestion
- Sickle cell syndrome vasoocclusive crisis
- Dietary protein allergy
- Tumor
- Hirschsprung disease
- Adhesions
- Hemolytic uremic syndrome
- Toxin
- Meckel's diverticulum
- Hepatitis

2 - 5 y/o

- Gastroenteritis
- Viral illness
- Trauma (including inflicted injury)
- Appendicitis
- Pharyngitis
- Constipation
- Urinary tract infection
- Pneumonia
- Intussusception
- Foreign body ingestion
- Sickle cell syndrome vasoocclusive crisis
- Henoch Schönlein purpura
- 
-

- Ovarian torsion
- Intraabdominal abscess
- Tumor
- Adhesions
- Hemolytic uremic syndrome
- Hepatitis
- Meckel's diverticulum
- Toxin
- Primary bacterial peritonitis

> 5 y/o

- Viral illness
- Appendicitis
- Trauma
- Constipation
- Pharyngitis
- Pneumonia
- Urinary tract infection
- Diabetic ketoacidosis
- Sickle cell syndrome vasoocclusive crisis
- Henoch Schönlein purpura
- Ovarian torsion
- Testicular torsion
- Inflammatory bowel disease

- Ruptured ovarian cyst
- Cholecystitis
- Pancreatitis
- Urolithiasis
- Hepatitis
- Meckel's diverticulum
- Perforated ulcer
- Adhesions
- Hemolytic uremic syndrome
- Myocarditis, pericarditis
- Primary bacterial peritonitis
- Familial Mediterranean fever
- Abdominal migraine





**Surgical problems**

# Life threatening causes

- Trauma

- Motor vehicle accident
  - Child abuse



- Solid organ laceration
- Hollow viscus laceration

- Appendicitis

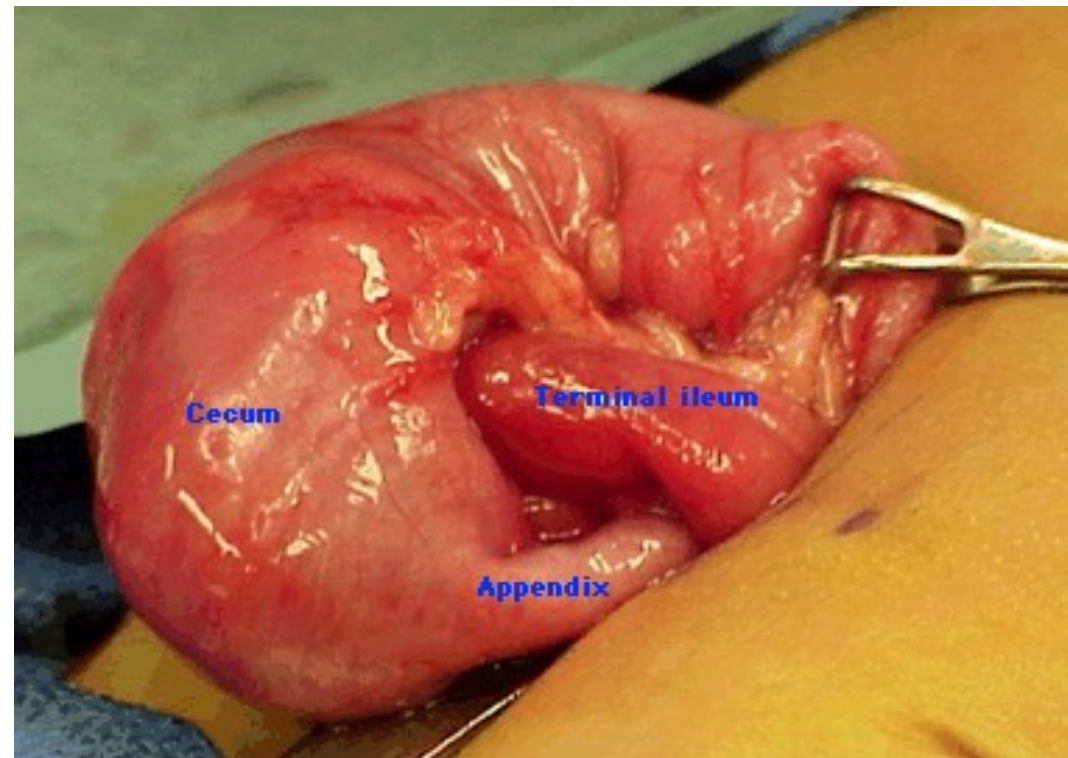
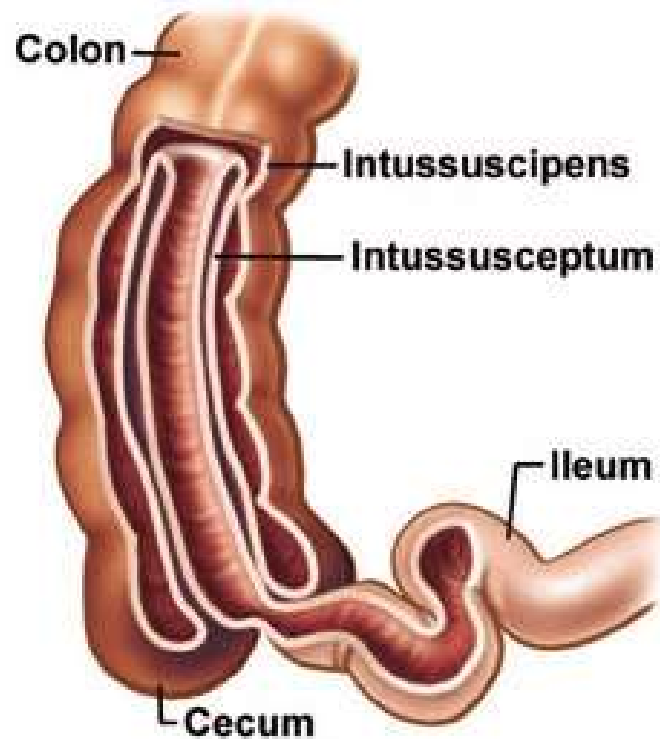
The three most predictive clinical features of appendicitis are pain in the right lower quadrant, abdominal wall rigidity, migration of periumbilical pain to the right lower quadrant.

However, at least one of these manifestations is frequently absent, particularly in younger children.

Meckles diverticulum:(Abdominal pain may develop as the result of mucosal ulceration (from ectopic gastric tissue) with perforation or from bowel obstruction )

- **Intussusception:** 3 months to 3 years of age
  - and present with characteristic pain that develops suddenly, is intermittent, severe, and classically accompanied by inconsolable crying with drawing up of the legs toward the abdomen.
  - **Bilious emesis** may develop as the obstruction progresses
  - **Lethargy or altered** consciousness can be the primary symptom of intussusception, especially in infants. Most children have gross or occult blood in the stool

# Ileocolic intussusception



**Intussusception** Surgical view of an ileocolonic intussusception. Courtesy of David Wesson, MD.

# Currant-jelly stool



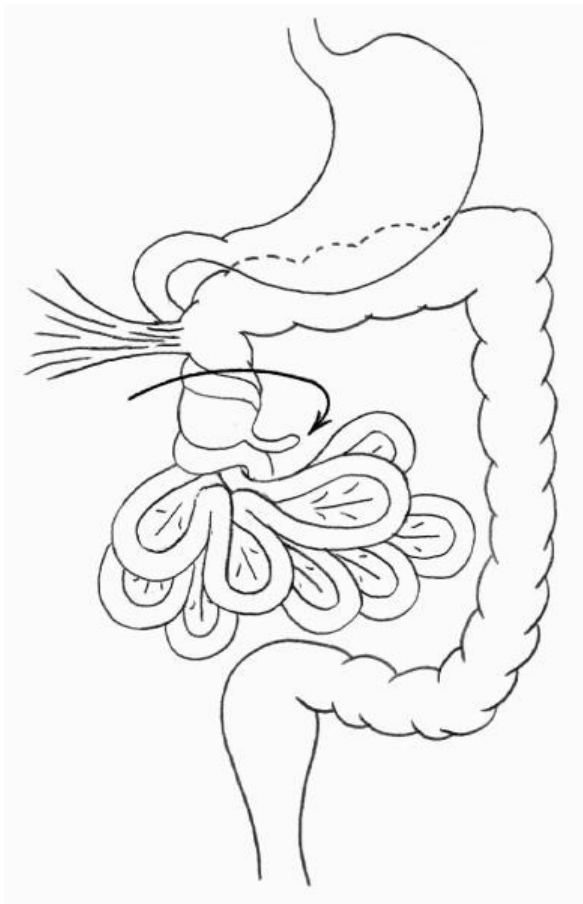
Mixture of blood and mucus  
Foul smelling

- **Malrotation & Midgut volvulus**
- Neonates : emesis (bilious or nonbilious)  
apparent abdominal discomfort

### result of midgut volvulus

- Over 50 percent of children with malrotation present before **one month** of age with this life-threatening complication

# UGI with SBFT



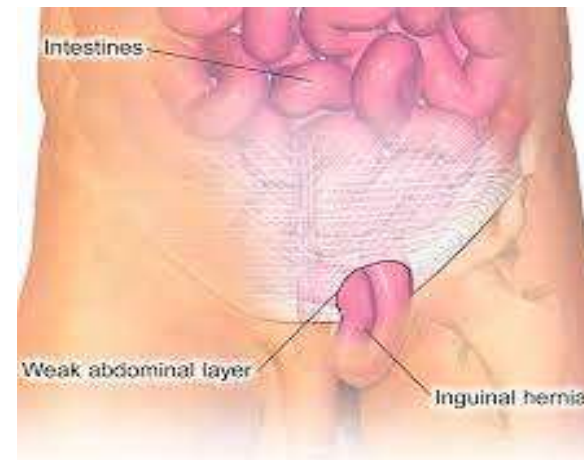
Cork-screw pattern - barium flowing through restricted bowel lumen



- **Incarcerated inguinal hernia**

- irritability and crying
- Vomiting and abdominal distention

depending on the duration of incarceration and whether or not intestinal obstruction has occurred



Inguinal Hernia

# Intestinal Obstruction

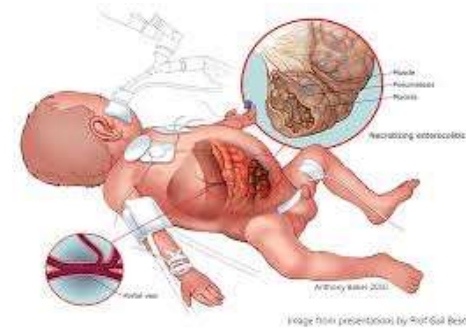
- Adhesion with intestinal obstruction previous abdominal surgery
- May have small bowel obstruction (SBO) as the result of adhesions



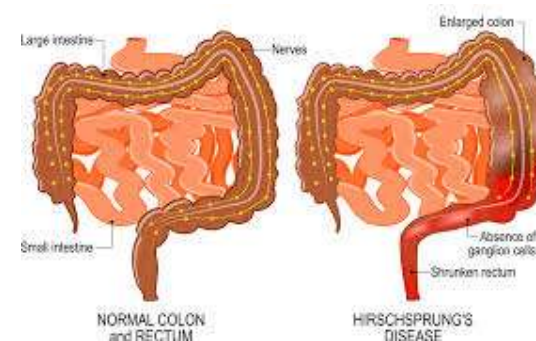
- **Testicular torsion** causes scrotal pain that may radiate to the abdomen.
- Patients may have associated nausea, vomiting, and fever. The affected testis usually is tender, swollen, and slightly elevated because of shortening of the cord from twisting
- **Ovarian torsion** result of an ovarian mass or cyst, but can develop in normal ovaries.
- Nausea and vomiting frequently occur.
- Partial or intermittent ovarian torsion may present as intermittent abdominal pain.



- **Necrotizing enterocolitis** Newborns intestinal necrosis, typically have vomiting, abdominal distention, and tenderness



- **Hirschsprung associated enterocolitis (HAEC)** is an uncommon, fulminant complication of Hirschsprung disease.
- Children typically have explosive diarrhea, fever, and abdominal pain.
- HAEC can occur prior to surgical intervention, in the immediate postoperative period, or **more than two years** after definitive repair.



- **Hemolytic uremic syndrome**

- \* Shiga toxin-producing enterohemorrhagic E. Coli (EHEC)

- \* Shigella

- \* Pneumococcal infection, HIV, and genetic factors.

- Bloody diarrhea, & **Triad of** hemolytic anemia, thrombocytopenia, acute renal injury

- **Henoch-Schönlein purpura** (HSP [IgA vasculitis (IgAV)] ) is a systemic vasculitis affecting small vessels in **skin, gut, and glomeruli**
- colicky abdominal pain (presumably due to local vasculitis).
- purpuric rash involving predominantly the lower extremities and buttocks
- Stool often contains gross or occult blood.
- Rare complications of HSP (IgAV) that can cause abdominal pain include **intussusception (typically in the ileum), pancreatitis, and cholecystitis.**
- **Sickle cell syndromes** :acute painful episodes that may manifest as abdominal pain



# Ectopic pregnancy

- Postmenarchal girls.
- Abdominal pain, amenorrhea, and vaginal bleeding are the classic symptoms, with or without rupture.
- Life-threatening hemorrhage can occur with rupture.
- Symptoms typically appear **six to eight** weeks after a missed menstrual period.



# Abdominal pain



Intra - abdominal

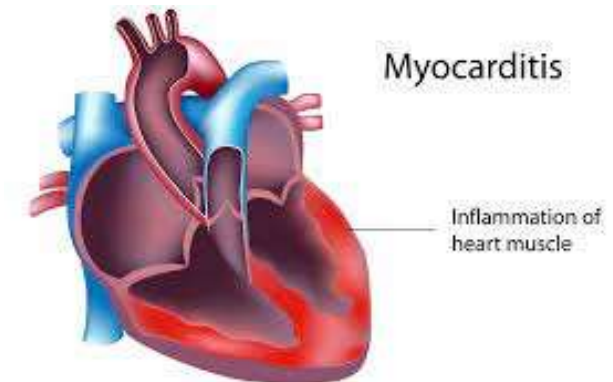


Eextra- abdominal



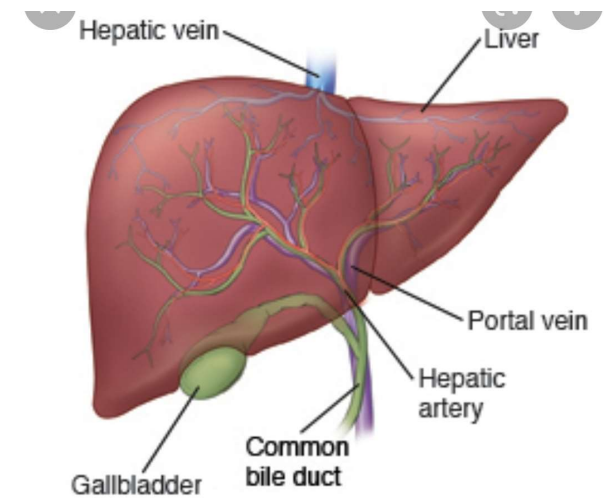
# Extra- abdominal

- Streptococcal pharyngitis
- Pneumonia
- Myocarditis (hepatic congestion)
- Myocardial infarction
- Congestive heart failure
- Pericarditis



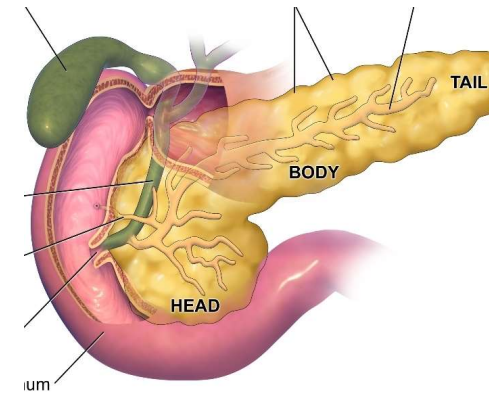
# Intra- abdominal

- **Liver:** hepatitis  
gallstone  
cholecystitis



- **Pancreas :** pancreatitis : acute , chronic

- **Renal:** UTI  
Stone  
hydronephrosis



# Cont,

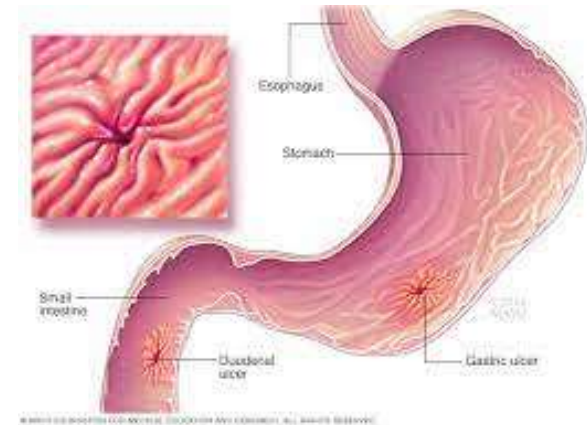
- Pelvic infection
- Mesenteric lymphadenitis
- Ruptured ovarian cyst



- **Malignant solid tumors**
  - Wilms' tumor and neuroblastoma more commonly in infants,
  - leukemic or lymphomatous involvement of the liver, spleen, or retroperitoneal lymph nodes occurs more often in older children.
- Hepatic tumors, ovarian tumors, Burkitt lymphoma, and soft tissue sarcomas.

# GI – causes

- **Peptic disease:** esophagus, stomach, duodenum
- Constipation
- GI infections ( G/E, infestations)
- IBD
- Dietary protein allergy
- Malabsorption (celiac)
- Foreign body ingestion
- Constipation

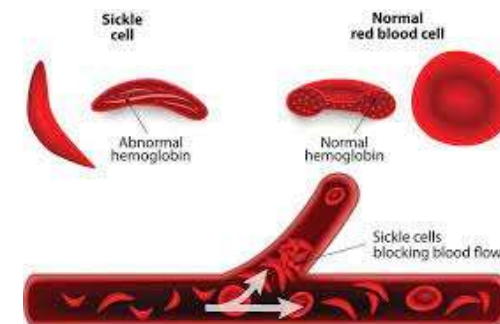


☐ **Toxins** include lead and iron.

- **Lead poisoning** is usually the result of chronic ingestion and causes intermittent abdominal pain.
- **Iron poisoning** is typically an acute ingestion with other gastrointestinal symptoms, such as vomiting and diarrhea

# Uncommon Life Threatening Causes

- **Diabetic ketoacidosis** (DKA) polyuria, polydipsia, and glycosuria,
- but may also present with abdominal pain and vomiting, especially in young children
- **Sickle cell syndromes** :acute painful episodes that may manifest as abdominal pain



## □ Acute porphyria

- Present with a variety of nonspecific **neurovisceral symptoms** (eg, abdominal pain, psychiatric disorders, neurologic symptoms), the most common of which is abdominal pain.
- These can include potentially life-threatening neurological effects (eg, seizures, coma, bulbar paralysis)
- Elevations in the porphyrin precursors delta-aminolevulinic acid (ALA) and porphobilinogen (PBG).
- Symptoms usually occur as acute attacks, but are sometimes chronic

## ❑ Familial Mediterranean fever



**Episodic** attacks of fever lasting one to three days and accompanied in most cases by

- Abdominal pain,
  - Pleurisy, and
  - Arthralgias or arthritis, the result of accompanying serositis and synovitis.
- 
- Elevation in peripheral white blood cell count and acute phase markers

Persistent inflammation can lead to secondary (AA) amyloidosis



- **Abdominal migraine**
- childhood periodic syndromes):  
acute onset of abdominal pain :  
periumbilical (78 percent)  
diffuse (16 percent)
- more common after age seven years.
- The pain is often incapacitating, with or without vomiting and headache.
- A family history of migraine is common.

# Diagnosis

- Hx , P/E , Rectal exam
- Lab, CBC, ESR,
- ESR, CRP, celiac panel
- Liver function test, Amylase and lipase, VBG\
- CXR, Abdx- ray,
- Sonography
- Endoscopy , colonoscopy