EMERGENCY EVALUATION OF THE CHILD WITH ACUTE ABDOMINAL PAIN

Introduction

- The emergency evaluation of children with acute abdominal pain:

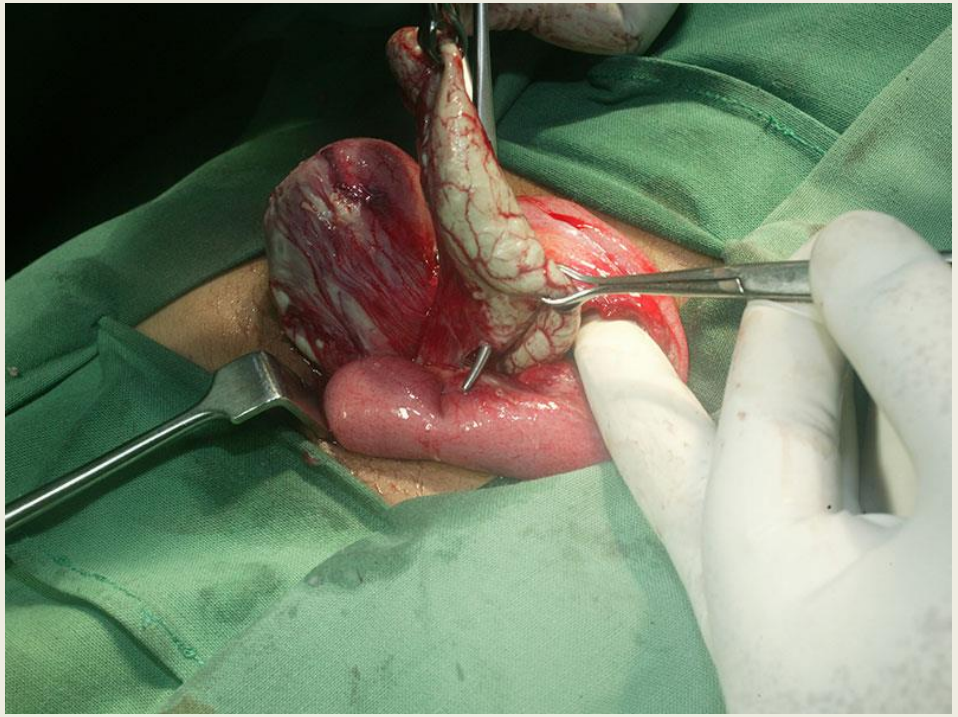
Life-Threatening

COMMON CAUSE

Background

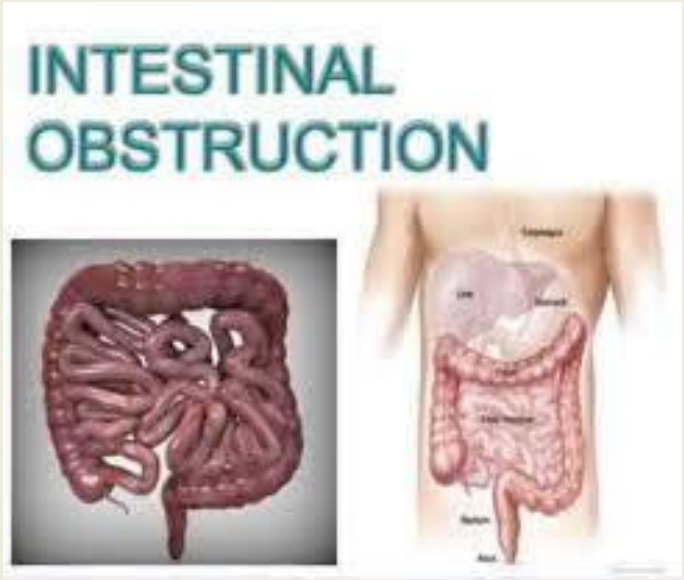
- Abd. pain: a frequent, nonspecific symptom: typically: self-limited: GE, constipation, and viral illnesses.
- The challenge: pts who may have the following:
  - *Serious, potentially life-threatening conditions:*
    - Acute abdomen: appendicitis, volvulus, intussusception, or adhesions
    - Acute manifestations of IBD
    - Pancreatitis
    - Hepatitis
    - Myocarditis
  - *Extraabdominal infections: strep. pharyngitis, UTI, pneumonia*
  - *Unusual manifestations of less common dx (Hirschsprung or SBP)*
  - *DKA*

In observational series describing children with abd. pain: 22 % had diagnoses that required surgery or treatment with antibiotics



- Specific ages (volvulus in neonates, intussusception in older)
- Children:
  - *Cannot describe or localize their symptoms*
  - *May be anxious: physical findings challenging.*
- The etiology: a careful Hx, single or repeated P/E, and selective ancillary testing.
- Pts: early in the course of appendicitis: no definitive Dx on the initial evaluation.
- Repeat examination and reliable follow-up: essential.

- Life-threatening causes
- Common causes
- Intra abd vs extra abd
- GI vs non GI



Peritoneal irritation

Common conditions:

- *viral gastroenteritis*
- *systemic viral illness*
- *streptococcal pharyngitis*
- *lobar pneumonia*
- *urinary tract infections.*

- An exacerbation of a chronic condition:
  - *Constipation*
  - *functional abdominal pain*
  - *GER*
  - *dietary intolerance.*
- In 1-3 m/o infants: colic masquerades as abdominal pain and fussiness.

Gastrointestinal conditions:

- IBD
- Cholelithiasis
- Pancreatitis
- Intraabdominal abscess (perforated appendicitis)
- Cholecystitis

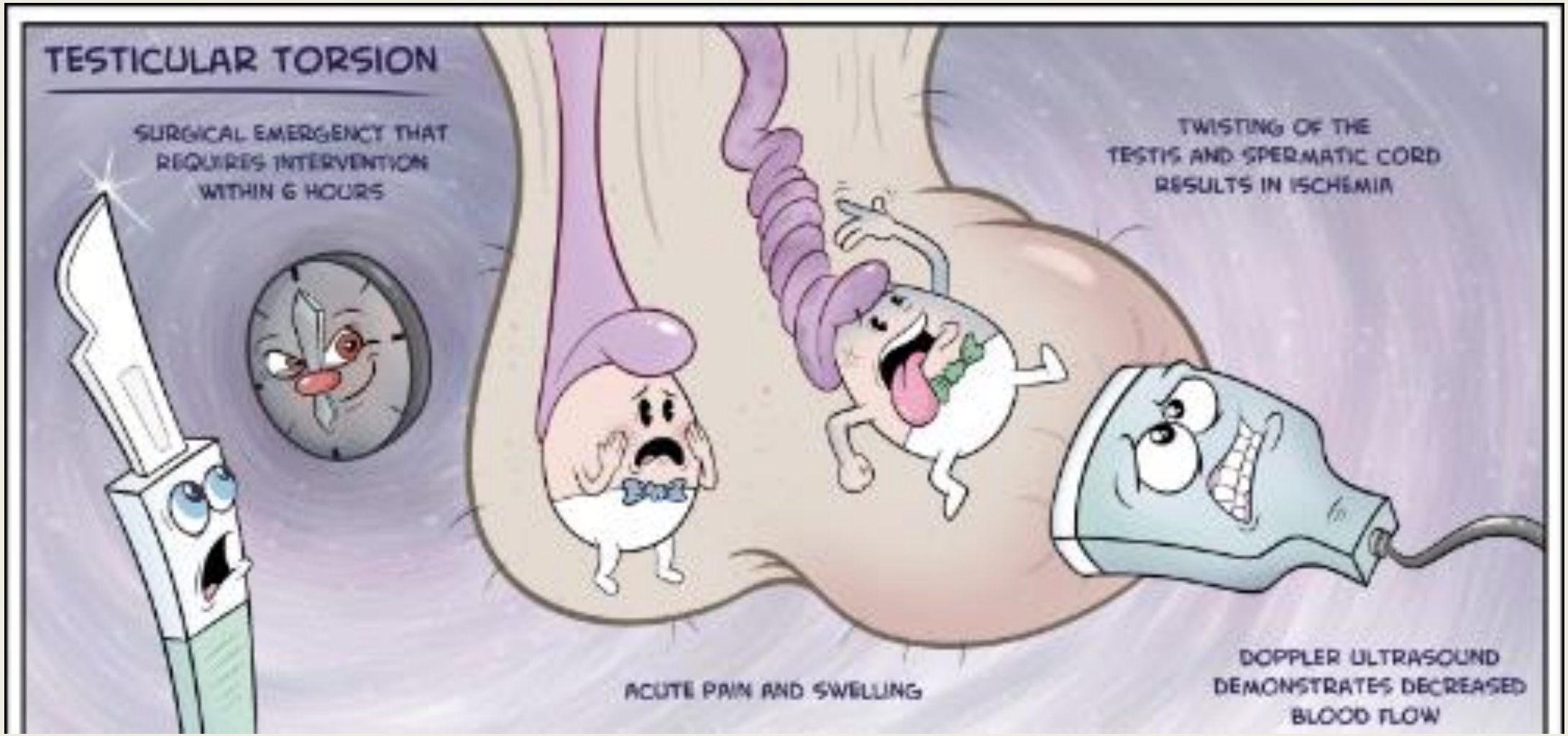
Mesenteric Adenitis

- Inflammation of the mesenteric lymph nodes: present with acute or chronic abdominal pain.
- The nodes: usually in the RLQ: mimics appendicitis and intussusception.
- Dx: ultrasound: abdominal lymph nodes (> 8 mm)
- The presence of enlarged lymph nodes: not exclude appendicitis/ intussusception
- Etiology: viral and bacterial GE, IBD, TB and lymphoma: viral infection is most common
- Acute: self-limited: supportive, pain management and adequate hydration
- Abdominal pain resolves within 1-4 weeks, to 10 weeks
- prolonged symptoms, weight loss or other systemic symptoms: more evaluation
- Compared to appendicitis:
  - *longer duration of symptoms prior to presentation:*
  - *Less occurred: vomiting, migration of pain, percussion tenderness, rebound tenderness, or Rovsing sign*
  - *higher fever (when present), and normal WBC counts and C-reactive protein levels*

- Infants with colic: irritability, crying, or appear to have abdominal pain
- Other clinical features that suggest the diagnosis of colic include:
  - *A typical pattern of paroxysmal crying lasting at least three weeks*
  - *Crying usually in the evening*
  - *Crying relieved with the passage of flatus or stool*
  - *Normal feeding and appropriate weight gain*
  - *No associated symptoms*
  - *Normal physical examination*

Non GI tract conditions:

- Vasoocclusive crisis with sickle cell syndromes
- Urolithiasis
- Ovarian torsion, PID with tubo-ovarian abscess, and ruptured ectopic pregnancy.
- Testicular torsion, Inguinal hernia, hydrocele, or epididymitis
- Intraabdominal tumors
- Toxic ingestions (plants, mushrooms, lead, or iron)


TESTICULAR TORSION
SURGICAL EMERGENCY THAT REQUIRES INTERVENTION WITHIN 6 HOURS
TWISTING OF THE TESTIS AND SPERMATIC CORD RESULTS IN ISCHEMIA
ACUTE PAIN AND SWELLING
DOPPLER ULTRASOUND DEMONSTRATES DECREASED BLOOD FLOW

Extra abdominal causes

- Myocarditis and pericarditis
- Systemic life-threatening: DKA, HSP, HUS
- Pneumonia
- Pharyngitis

- The first goal: identify life-threatening: emergency interventions.
- Subsequently, other causes of abdominal pain:
  - *attention to the clinical features*
  - *age and gender*
  - *history of trauma*
  - *pattern of the pain*
  - *related symptoms*
  - *physical findings*
  - *selected diagnostic studies*

History

- Key historical variables:
  - *Trauma*
  - *prior abdominal surgery*
  - *Fever*
  - *Vomiting*
  - *location of the abdominal pain*
  - *pattern of symptoms*
  - *gynecologic history: LMP, sexual activity for pubertal girls.*

# of abdominal pain

- Infants and children < 2 y/o: cannot describe or localize pain.
- The preschool: able to describe pain and other symptoms: may not be reliable.
- >5 y/o: characterize the onset, frequency, duration, and location of their symptoms.
- advanced appendicitis: pain aggravated by movement (coughing, traveling in the car or walking).
- visceral pain: writhe with discomfort.
- Improvement after emesis: small bowel
- Pain relief after bowel movement: colon: chronic constipation, or bowel inflammation

Specific DIAGNOSIS : pattern of pain:

- Appendicitis – Periumbilical, migrating to the right lower abdomen
- Appendiceal rupture (early), ovarian torsion – Acute, severe, focal
- Intussusception – Intermittent, colicky
- Gastroenteritis – Diffuse or vague
- Hepatitis and cholecystitis – Right upper quadrant
- Gastritis, gastric ulcer disease – Epigastric
- Pancreatitis – Steady periumbilical and/or subxiphoid pain, often radiating to the back
- Renal stone – Flank pain radiating to mid to lower lateral abdomen
- Constipation – Intermittent, often left sided

ASSOCIATED

symptoms

- Children with abdominal pain frequently have fever: 64 %
- Appendicitis: often have fever: initially low grade.
- abdominal pain+fever: **infection**: GE, viral syndromes, and pharyngitis
- Bacterial infections:
  - *Strep. Pharyngitis*
  - *UTI*
  - *Lower lobe pneumonia*
  - *PID (in postmenarchal, sexually active females)*

- Vomiting: frequent in children with abd. pain: 42 %
- vomiting + abdominal pain without diarrhea: life-threatening: bowel obstruction or appendicitis with peritonitis.
- Volvulus: bilious emesis and abdominal pain in a neonate
- Intussusception: vomiting (nonbilious……. Bilious)
- Small bowel obstruction: postop or postinflammatory adhesions, ascaris
- appendicitis, ovarian and testicular torsion, pancreatitis, and severe IBD

- Viral GE
- UTI
- Appendicitis with abscess formation: mucoid stools
- Intussusception: bloody stools, mixed with mucus (currant jelly)
- Bloody diarrhea: infectious enteritis, HUS, or IBD

Other symptoms

- Cough (pneumonia)
- Sore throat (pharyngitis)
- Dysuria (urinary tract infection)
- Polyuria (diabetic ketoacidosis)
- Hematuria (UTI, urolithiasis, HUS, HSP).

- Bowel obstruction from adhesions: abdominal surgery.
- Hirschsprung disease: obstruction and fulminant enterocolitis.
- Cholecystitis: sickle cell disease or CF.
- Vasoocclusive crisis: sickle cell disease.
- DM: DKA
- SBP: nephrotic syndrome, chronic liver disease, portal vein obstruction

Physical examination

- A comprehensive physical examination:
  - *vital signs*
  - *detailed abdominal examination*
  - *focused extraabdominal examination*

- Hypovolemia (abdominal injury, volvulus, or intussusception) or peritonitis (perforated appendicitis): signs of poor perfusion
- Peritonitis: lie still
- Biliary or renal colic: writhe in pain
- Jaundice: hepatitis or hemolysis
- Intussusception: early: quite well in between painful episodes of peristalsis.

- Fever: GE, UTI, pneumonia, or pharyngitis, appendicitis
- Tachypnea:
  - *pneumonia*
  - *hyperventilation*
    - metabolic acidosis: deeper and rapid breathing:
      - *dehydration from gastroenteritis, DKA, peritonitis, or intestinal obstruction*
- Hypotension:
  - *intravascular volume loss:*
    - Hemorrhage
    - GE
    - capillary leak: bowel obstruction: volvulus or intussusception
  - *septic shock with peritonitis (perforated appendicitis).*

Abdominal examination

- Quiet, in a position of comfort (caretaker's lap), before uncomfortable parts
- Distention: obstruction or a mass.
- Bowel sounds:
  - *decreased (ileus in response to peritoneal irritation from appendicitis)*
  - *increased (gastroenteritis or bowel obstruction).*
- Pain may be localized with gentle palpation performed in all 4 quadrants. Considerations include:
  - *ask to point with one finger to the spot that hurts the most.*
  - *focal tenderness: an intraabdominal inflammatory process.*
  - *older children: tenderness: exacerbated when the child lifts her head off of the table.*
  - *Percussive tenderness, rebound, and involuntary guarding: signs of peritoneal irritation (appendicitis or cholecystitis).*
  - *Percussion: increased tympany (as with distended bowel), dullness (as with a mass), and shifting dullness (as with ascites).*

Rectal examination

- Local tenderness, mass, constipation, and hematochezia
- Hard stool: constipation, not prove as the cause
- Blood in the stool:
  - *Intussusception*
  - *IBD*
  - *Inflamed Meckel's diverticulum*
  - *Dietary protein allergy*
  - *Infectious enteritis*
  - *Constipation with anal fissure.*
- Uterine or adnexal tenderness or masses: gynecologic source

General examination

- Pharyngeal erythema and/or exudate
- Crackles (Rales), focal, decreased breath sounds
- Muffled heart sounds or a rub and tachycardia
- gallop rhythm and tachycardia
- Flank tenderness
- Tender scrotal swelling
- Bruising
- Petechiae and/or purpura
- The sandpapery erythematous rash with perioral sparing
- Jaundice

studies

- Abdominal pain, otherwise healthy, well appearing, and have normal physical examinations: not require ancillary studies.
- Unremarkable repeated examinations and tolerate feeding: be discharged with reliable medical follow-up.
- Lab. and radiographic studies: when history and/or physical examination demonstrate focal findings or suggest concerning diagnoses (intraabdominal injury, appendicitis, bowel obstruction, or infection).

- WBC:
  - *An elevated WBC: infection or inflammation (appendicitis)*
  - *a normal WBC: not exclude these processes.*
  - *WBC >20,000: perforated appendicitis, appendiceal abscess, or lobar pneumonia.*
- HCT:
  - *blood loss*
  - *misleading in dehydration.*
  - *Anemia with abnl red cell morphology:*
    - hemoglobinopathies (sickling)
    - hemolytic uremic syndrome: thrombocytopenia.
- Upper abdominal pain:
  - *Abnl liver enzyme: hepatitis, cholecystitis*
  - *Abnl lipase or amylase: pancreatitis, cholecystitis*

- Metabolic acidosis:
  - *Dehydration*
  - *intestinal obstruction*
  - *Peritonitis*
  - *DKA: elevated BS in the setting of acidosis:*
- Urine dipstick: if abnl: urinalysis
  - *Hematuria:*
  - *Pyuria:*
  - *glucosuria and ketonuria: DKA*
- Pregnancy testing

- An essential component of the evaluation in the clinical setting of:
  - *Trauma*
  - *peritoneal irritation*
  - *signs of obstruction*
  - *Masses*
  - *distension*
  - *focal tenderness and/or pain.*
- Children with a typical clinical presentation for acute appendicitis: consult an experienced surgeon prior to obtaining imaging studies.

Plain radiography

- In most instances: **not** helpful
- Signs of obstruction or perforation
- Not routinely indicated for the evaluation of functional constipation
- Obstruction or mass?
- CXR: basilar pneumonia or signs of myocarditis (cardiomegaly)

Ultrasound:

- No radiation, at the bedside:
- Gallstones.
- Genitourinary (ovarian torsion, ruptured ovarian cyst, and testicular torsion).
- Intussusception
  - *Ultrasound: best dx test for intussusception.*
- Appendicitis: US is the recommended imaging modality for children with atypical or equivocal findings: experience of the ultrasonographer, and child's BMI

CT scan:

- The radiation exposure: significant.
- CT **with** contrast: appendicitis, pancreatitis, intraabdominal abscess, blunt abdominal trauma, and intraabdominal mass
- The most sensitive imaging test for pediatric nephrolithiasis.

Magnetic resonance imaging

- Not used for urgent evaluation of children with abdominal pain.

- Effective analgesia: recommended
- Controversial: Classic teaching is that opiates can alter examination findings, potentially complicating the diagnostic process.
- 3 clinical trials: morphine in children with acute abdominal pain: significant pain reduction without affecting the examination or the ability to identify those with surgical conditions

- Most children with acute abdominal pain who have conditions that require emergent diagnosis and treatment can be effectively identified with a systematic approach that considers age, the presence of worrisome clinical features, and selected ancillary studies

- Life-threatening injuries
- The 1st step in the evaluation of abd pain
- Symptoms: immediately vs delayed:
  - *lt shoulder pain: slowly expanding splenic hematoma*
  - *vomiting: obstruction: duodenal hematoma*
  - *bowel perforation: seatbelt injury*
- Mechanisms: motor vehicle crashes, motor vehicle pedestrian collisions, falls, and physical assault (child abuse).
- Rapid, aggressive stabilization and evaluation are indicated for children with the following:
  - *Unstable V/S at presentation*
  - *Obvious serious or multiple injuries*
  - *High risk mechanism (penetrating injury, severe blunt trauma, fall from > 20 feet, ejection from a vehicle, impact velocity > 30 miles / hr)*
  - *Identification of specific injuries, when clinically indicated, typically requires imaging:*
    - FAST examination: detect free fluid (usually blood) in the abdomen.
    - Solid organ injuries: abdominal CT
    - perforated viscus: plain radiographs (although nl plain radiography does not exclude perforation).

Obstruction or peritoneal irritation: prompt diagnosis and treatment

- Obstruction:
  - *abdominal distention and/or bilious vomiting)*
  - *history of prior abdominal surgery (predisposing to adhesion)*
- Peritoneal irritation
  - *guarding, percussive tenderness, and rebound*
- Clinical findings suggest obstruction or peritonitis: treatment (laparotomy for suspected appendicitis) or diagnostic steps
- Supportive care (monitoring, IV fluids, analgesia, and IV antibiotics)
- Hospital admission for observation and serial examinations

Obstruction

- Volvulus (most often in neonates):
- Intussusception (2m-2yr): : typical feature
- Incarcerated inguinal hernia
- Adhesions from previous surgery or inflammation: Hirschsprung

Peritoneal irritation

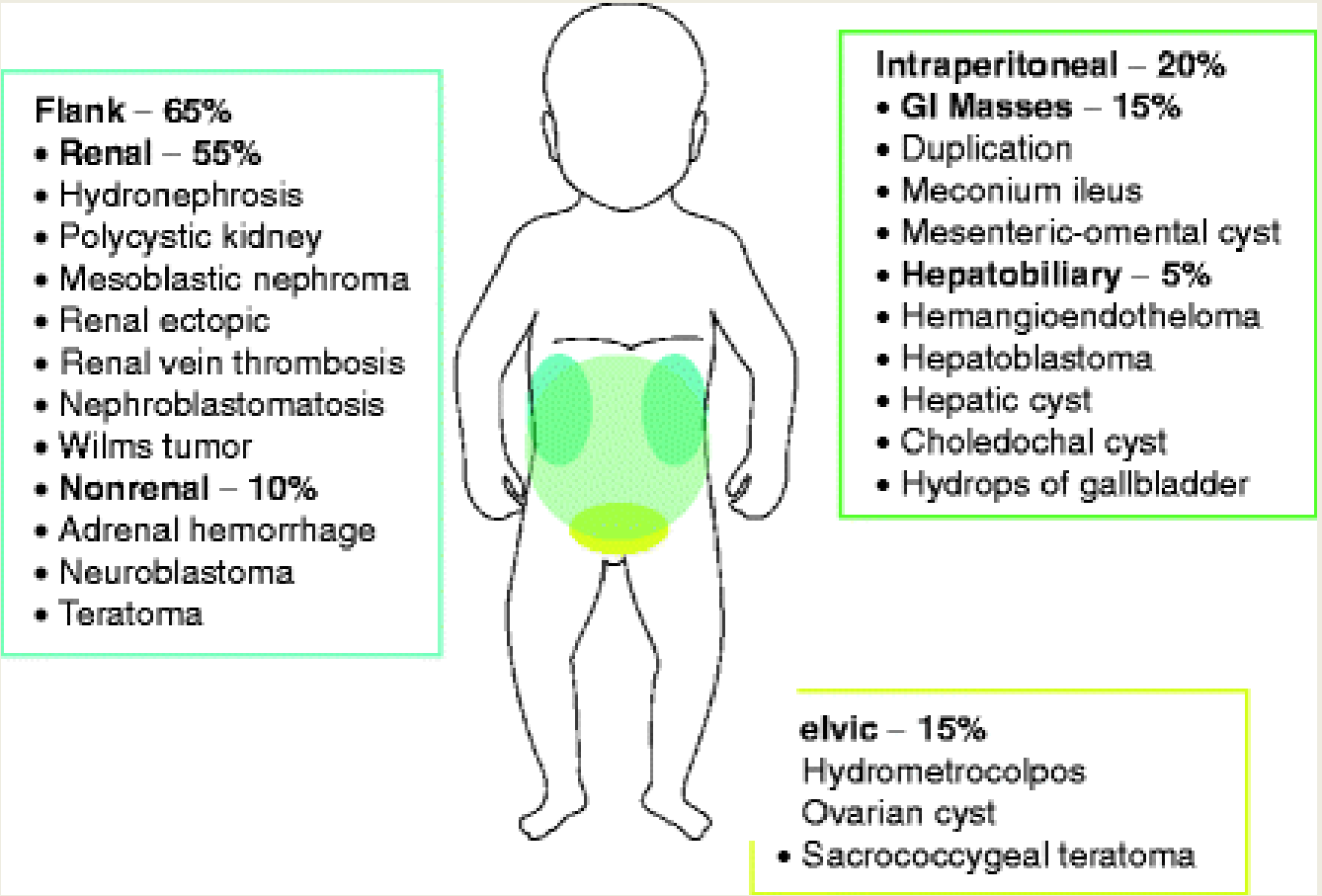
- NEC
- Appendicitis: most commonly>5 y/o: peritoneal irritation and focal tenderness.
- Ingested foreign body: button batteries & magnets.
- Ascites: spontaneous bacterial peritonitis.
- Cholecystitis and pancreatitis
- Meckel's diverticulum
- Perforation of a peptic ulcer: unusual in <10 y/o

Extraabdominal

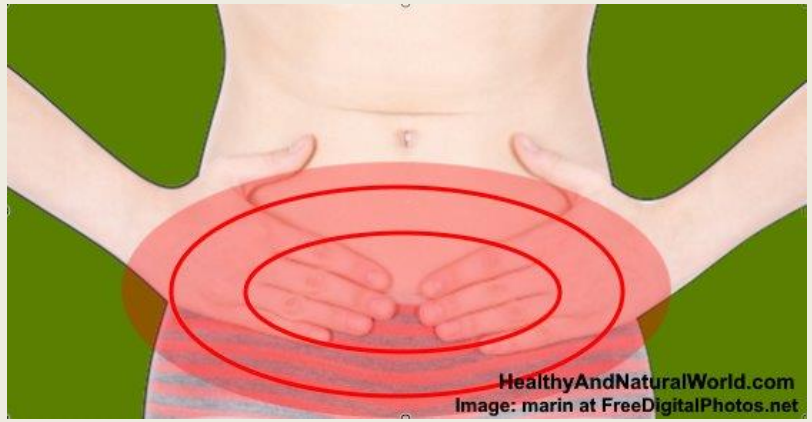
- Full physical examination
- Signs of systemic illness: vital signs, skin, pharynx, the chest, the heart, and the genital region.
- HSP
- Strep. Pharyngitis
- Lower lobe pneumonia or pleural effusion
- Myocarditis and pericarditis

Abd mass:

- The right abdomen: intussusception
- Malignant solid tumors: rare causes of abd pain
- Intraabdominal abscesses: fever and previous abdominal surgery.
- Constipation: fecal mass.



Focal tenderness



- RLQ tenderness: appendicitis
- Lower abd. tenderness: Ovarian torsion
- RUQ tenderness: Cholecystitis
- Epigastric or periumbilical tenderness: pancreatitis .
- Tenderness in the flank and lower abdomen: Urolithiasis & Pyelonephritis

Colicky pain

- Intussusception: 2m-2 yr:
  - *diffuse, colicky, severe abdominal pain*
- Renal or biliary colic
- Bowel obstruction.
- Imaging: ultrasound and contrast enema.

Nonspecific

- DKA: Kussmaul respirations, "fruity" breath, polyuria, glucosuria, ketonuria, weight loss
- HUS: bloody diarrhea, pallor, petechiae, microangiopathic anemia, thrombocytopenia, renal failure
- HSP
- Pancreatitis (elevated amylase and lipase levels)
- Urolithiasis (hematuria)
- Iron intoxication (occult blood in stool, foreign body on abdominal plain radiography)
- Hepatitis (jaundice, hyperbilirubinemia)

- Scores ≤4: very low likelihood of appendicitis
- scores ≥8: highly sensitive and specific for appendicitis.
- Intermediate scores: 4-7: inconclusive: advanced imaging studies.

Table 370.1 Pediatric Appendicitis Scores

FEATURE	SCORE
Fever > 38°C (100.4°F)	1
Anorexia	1
Nausea/vomiting	1
Cough/percussion/hopping tenderness	2
Right lower quadrant tenderness	2
Migration of pain	1
Leukocytosis > 10,000 (10^9/L)	1
Polymorphonuclear-neutrophilia > 7,500 (10^9/L)	1
Total	10

Selected identifiable causes of prolonged/excessive crying in an infant younger than four months of age

Condition	Clinical features
General	
Drug ingestion or overdosage (eg, pseudoephedrine)	History of medication administration
Hunger/inadequate feeding	Signs of hypovolemia or undernutrition (eg, sunken fontanelle, dry mucous membranes, decreased subcutaneous fat, etc)
Neonatal abstinence syndrome	Maternal history of prenatal substance use or positive urine screen (maternal or fetal)
Skin	
Hair tourniquet of digit or penis	Apparent on physical examination
Open diaper pin poking the skin, diaper rash	Apparent on physical examination
Trauma (abusive or nonabusive)	Bruising, laceration
Eyes	
Corneal abrasion or foreign body	May have photophobia, positive fluorescein examination
Glaucoma	Chronic or intermittent tearing, photophobia, corneal enlargement, corneal clouding, optic nerve cupping, ocular enlargement
Ears, nose, oropharynx	
Otitis media	Bulging tympanic membrane
Thrush	White plaques on the buccal mucosa, tongue, or palate
Cardiovascular	
Anomalous origin of the left coronary artery	Cardiomegaly, heart failure
Heart failure	Feeding intolerance, tachycardia, poor perfusion, tachypnea
Supraventricular tachycardia	Pallor, irritability, poor feeding, cyanosis, restlessness

Gastrointestinal	
Anal fissures	Apparent on physical examination
Constipation	Passage of hard stools
Gastroenteritis	Vomiting, diarrhea
Gastroesophageal reflux	Vomiting, poor weight gain, feeding refusal, gross or occult blood in the stool
Gastrointestinal obstruction (eg, pyloric stenosis, intussusception, volvulus)	Vomiting (may or may not be bilious or forceful), gastrointestinal bleeding, forceful vomiting, abdominal tenderness, distension, right-sided sausage-shaped abdominal mass (intussusception), palpable "olive" (pyloric stenosis)
Inguinal hernia	Bulge in the groin area (may be intermittent), vomiting and abdominal distension may indicate incarceration
Genitourinary	
Meatal ulcer	Apparent on examination
Ovarian torsion	Feeding intolerance, vomiting, abdominal distension, fussiness/irritability
Testicular torsion	Acute testicular swelling and tenderness
Urinary tract infection	Fever, suprapubic tenderness, poor feeding, poor weight gain
Urinary tract obstruction	Abdominal distension (due to enlarged bladder), difficulty voiding, poor urinary stream, straining or grunting during voiding
Skeletal	
Fracture	Decreased movement of extremity, asymmetric Moro reflex, localized swelling and crepitation, increased pain response with movement of the extremity
Osteomyelitis or septic arthritis	Fever, decreased movement of extremity, asymmetric Moro reflex, increased pain response with movement of the extremity
Neurologic	
Abusive head trauma	Seizures, respiratory difficulty or apnea, retinal hemorrhages, cutaneous bruising, associated injuries
Meningitis	Fever, bulging fontanelle, lethargy, irritability, meningismus (often not present in infants)
Neuromuscular disease, CNS disorder, metabolic disease	Abnormal tone, muscular weakness

Causes of acute abdominal pain in children by age

Neonate	1 month to 2 years	2 to 5 years	>5 years
Adhesions*	Adhesions*	Adhesions*	Adhesions*
Necrotizing enterocolitis*	Foreign body ingestion*	Appendicitis*	Appendicitis*
Volvulus*	Hemolytic uremic syndrome*	Foreign body ingestion*	Diabetic ketoacidosis*
Colic¶	Hirschsprung disease*	Hemolytic uremic syndrome*	Hemolytic uremic syndrome*
Dietary protein allergy	Incarcerated hernia*	Intussusception*	Myocarditis, pericarditis*
Testicular torsion	Intussusception*	Primary bacterial peritonitis*	Perforated ulcer*
	Trauma (including inflicted injury)*	Trauma (including inflicted injury)*	Primary bacterial peritonitis*
	Gastroenteritis¶	Gastroenteritis¶	Trauma*
	Viral illness¶	Viral illness¶	Constipation¶
	Dietary protein allergy	Pharyngitis¶	Gastroenteritis¶
	Hepatitis	Constipation¶	Pharyngitis¶
	Inflammatory bowel disease	Henoch Schönlein purpura	Viral illness¶
	Meckel's diverticulum	Hepatitis	Abdominal migraine
	Sickle cell syndrome vasoocclusive crisis	Inflammatory bowel disease	Cholecystitis or cholelithiasis
	Toxin	Intraabdominal abscess	Familial Mediterranean fever
	Tumor	Meckel's diverticulum	Gastrointestinal dysmotility
	Urinary tract infection	Urinary tract infection	Henoch Schönlein purpura
		Ovarian torsion	Hepatitis
		Pancreatitis	Inflammatory bowel disease
		Pneumonia	Intraabdominal abscess
		Sickle cell syndrome vasoocclusive crisis	Meckel's diverticulum
		Toxin	Ovarian torsion
		Tumor	Pancreatitis
			Pneumonia
			Ruptured ovarian cyst
			Sickle cell syndrome vasoocclusive crisis
			Testicular torsion
			Urinary tract infection
			Urolithiasis

NEONATE

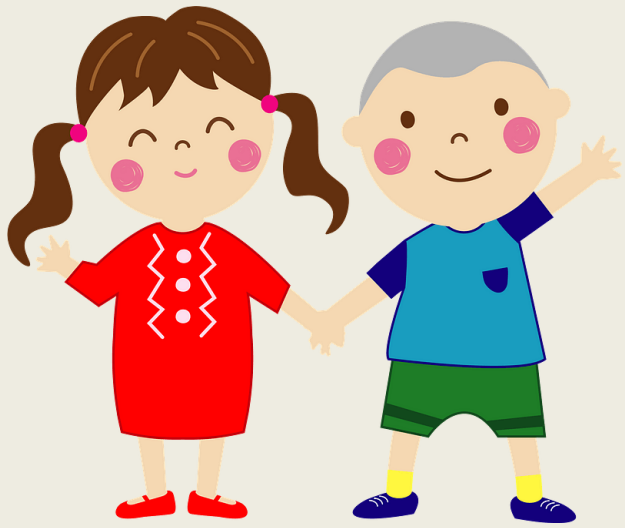
- Adhesions*
- Necrotizing enterocolitis*
- Volvulus*
- Colic¶
- Dietary protein allergy
- Testicular torsion

2m-2y/o

- Adhesions*
- Foreign body ingestion*
- Hemolytic uremic syndrome*
- Hirschsprung disease*
- Incarcerated hernia*
- Intussusception*
- Trauma (including inflicted injury)*
- Gastroenteritis¶
- Viral illness¶

- Dietary protein allergy
- Hepatitis
- Inflammatory bowel disease
- Meckel's diverticulum
- Sickle cell syndrome vasoocclusive crisis
- Toxin
- Tumor
- Urinary tract infection

2-5 y/o



- Adhesions*
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- Primary bacterial peritonitis*
- Trauma (including inflicted injury)*
- Gastroenteritis¶
- Viral illness¶
- Pharyngitis¶
- Constipation¶

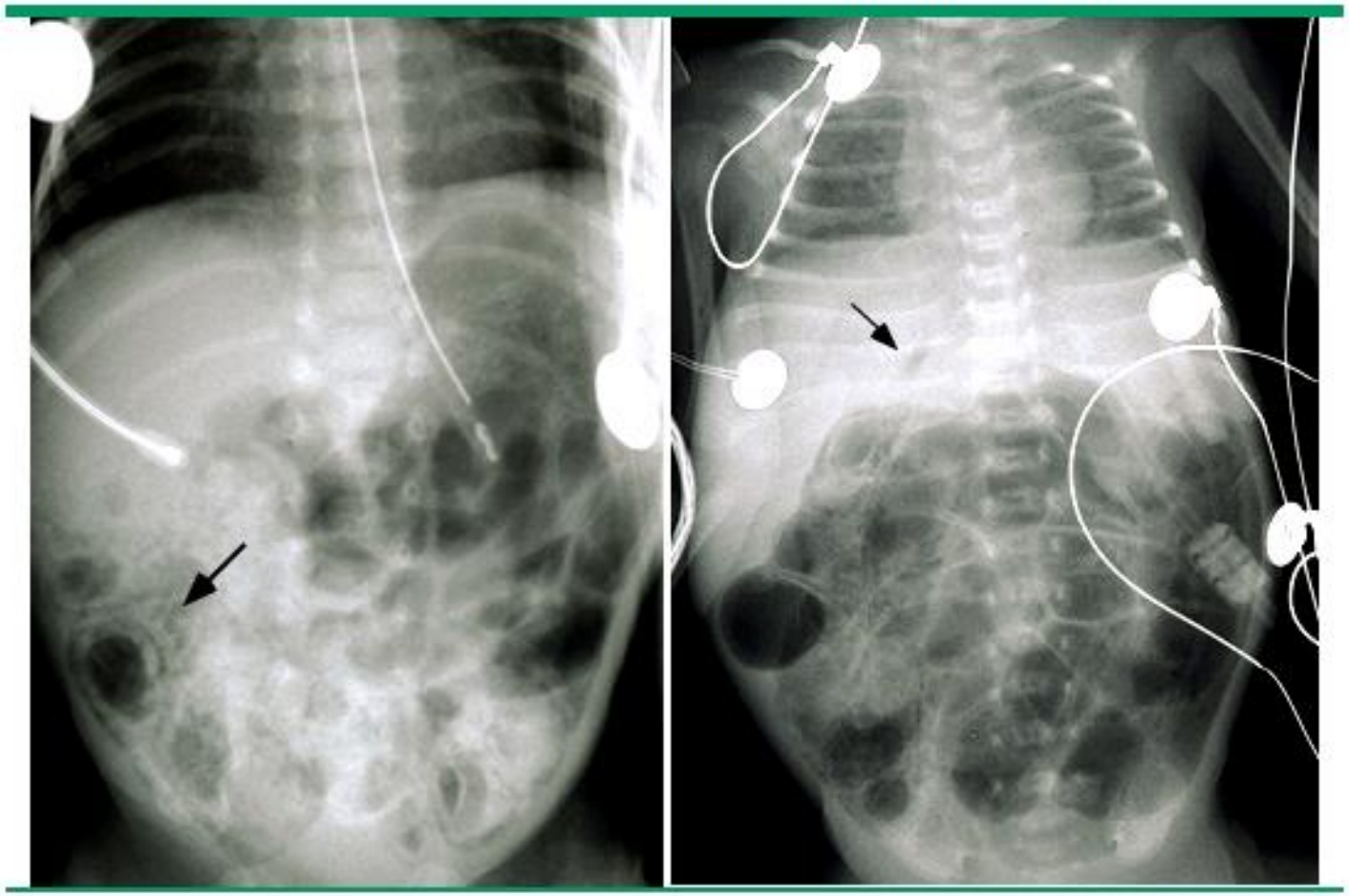
- Henoch Schönlein purpura
- Hepatitis
- Inflammatory bowel disease
- Intraabdominal abscess
- Meckel's diverticulum
- Urinary tract infection
- Ovarian torsion
- Pancreatitis
- Pneumonia
- Sickle cell syndrome vasoocclusive crisis
- Toxin
- Tumor

> 5y/o

- Adhesions*
- Appendicitis*
- Diabetic ketoacidosis*
- Hemolytic uremic syndrome*
- Myocarditis, pericarditis*
- Perforated ulcer*
- Primary bacterial peritonitis*
- Trauma*
- Constipation¶
- Gastroenteritis¶
- Pharyngitis¶
- Viral illness¶

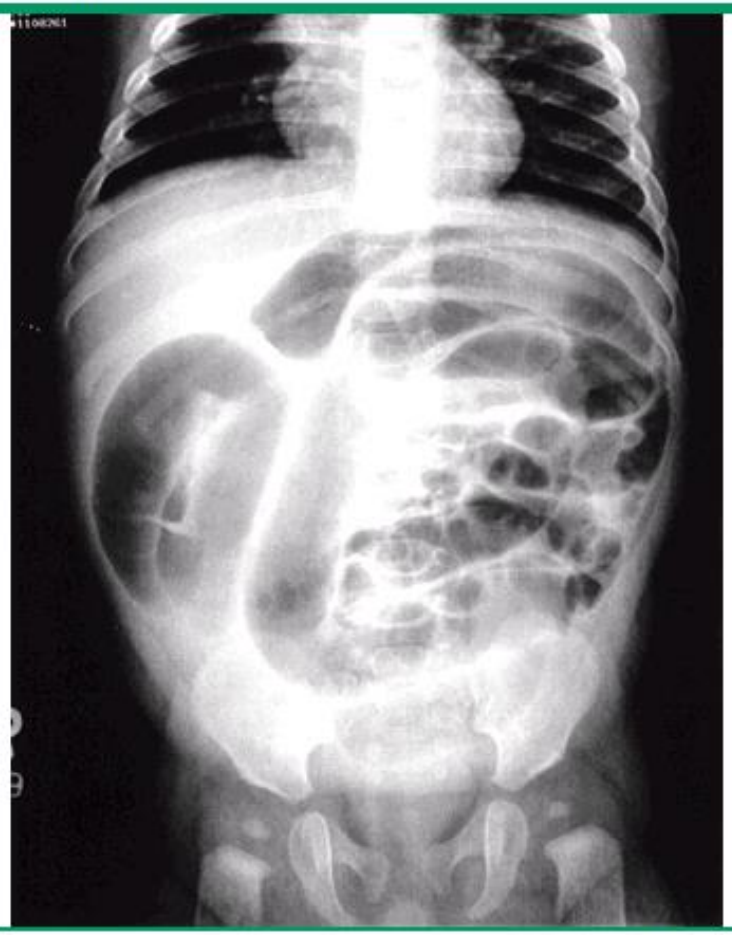
- Abdominal migraine
- Cholecystitis or cholelithiasis
- Familial Mediterranean fever
- Gastrointestinal dysmotility
- Henoch Schönlein purpura
- Hepatitis
- Inflammatory bowel disease
- Intraabdominal abscess
- Meckel's diverticulum
- Ovarian torsion
- Pancreatitis
- Pneumonia
- Ruptured ovarian cyst
- Sickle cell syndrome vasoocclusive crisis
- Testicular torsion
- Urinary tract infection
- Urolithiasis

Radiograph of necrotizing enterocolitis in premature infants



Plain abdominal radiographs in premature infants with necrotizing enterocolitis. Left panel: There is marked abdominal distention due in part to dilated bowel loops, and bubbles of gas in the bowel wall due to extensive pneumatosis intestinalis (arrow). An orogastric tube is in place. Right panel: There is marked abdominal distention, pneumatosis intestinalis, and a suspicion of portal venous (arrow) and/or free intraperitoneal air.

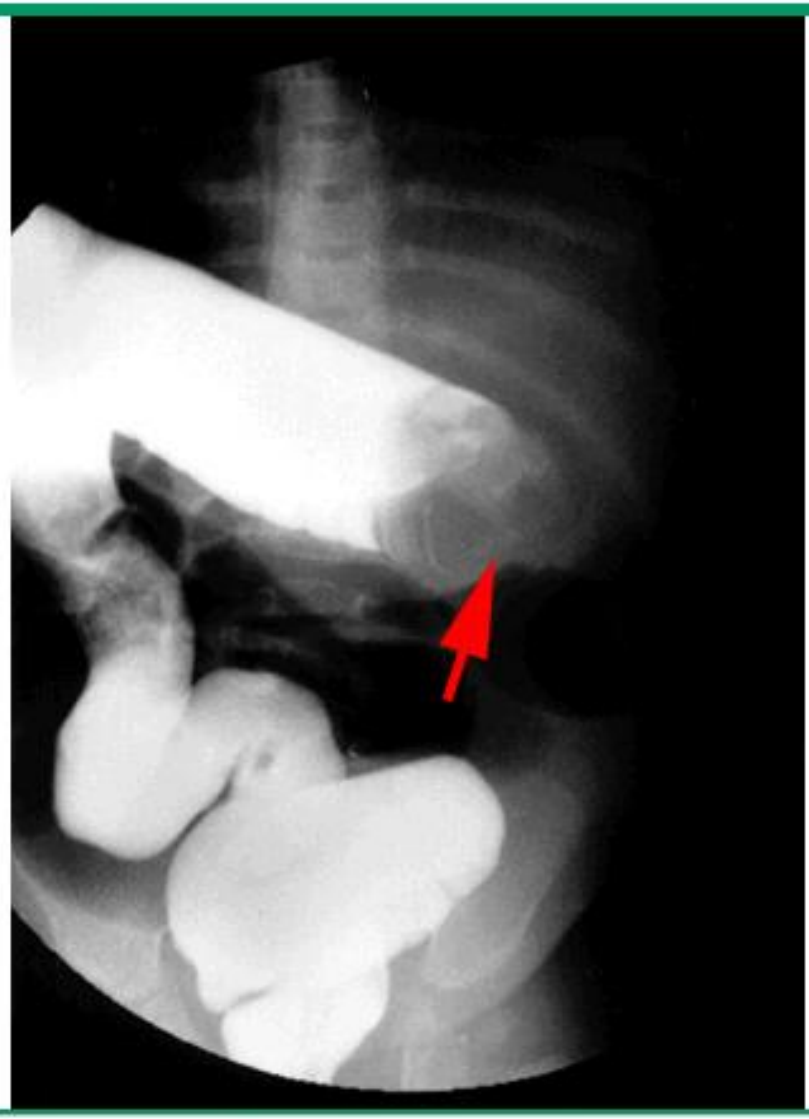
Intussusception



Plain film of a child with intussusception shows small intestinal obstruction. Notable are a dilated small bowel and the absence of colonic gas.

Courtesy of Nancy Fitzgerald, MD and Taylor Chung, MD.

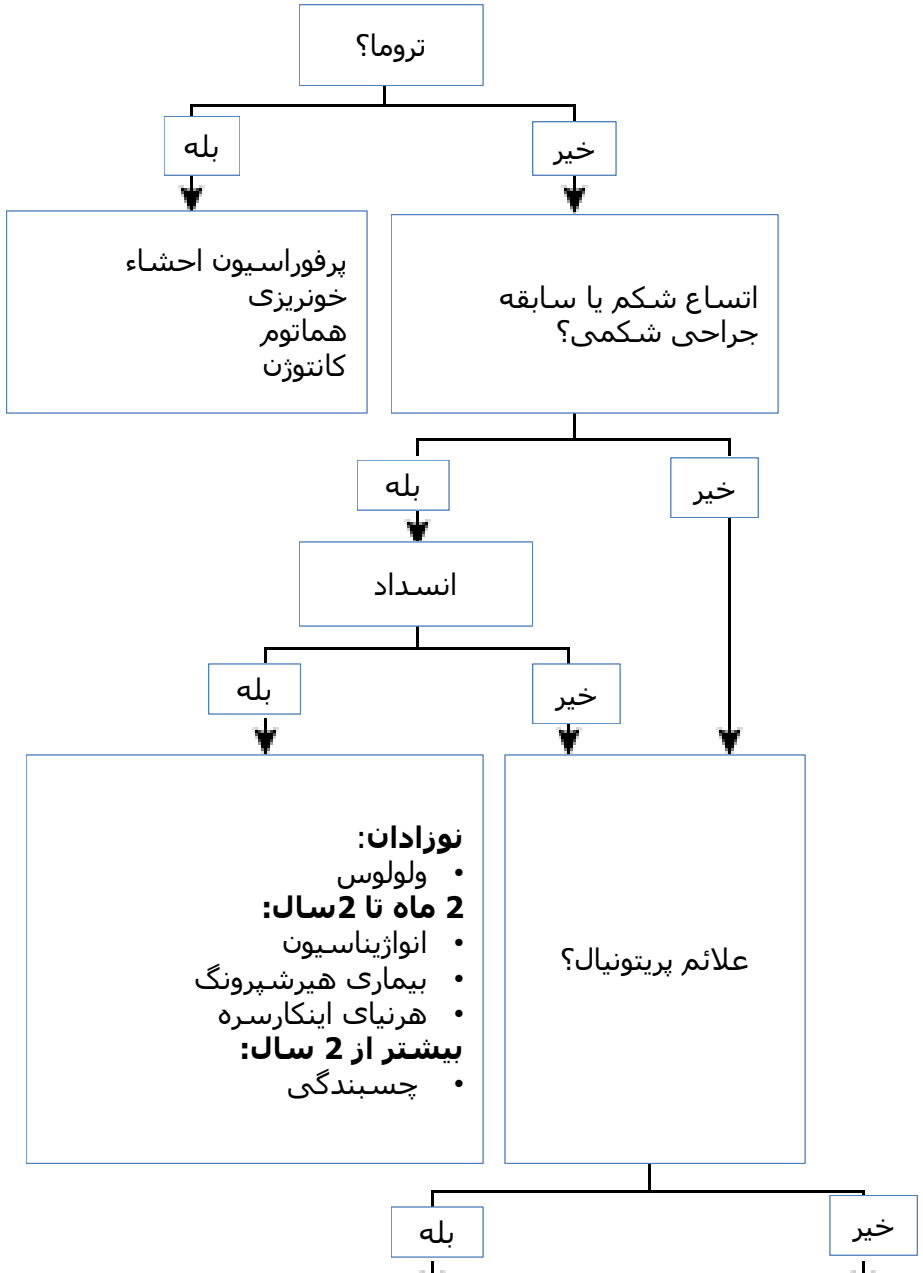
Intussusception

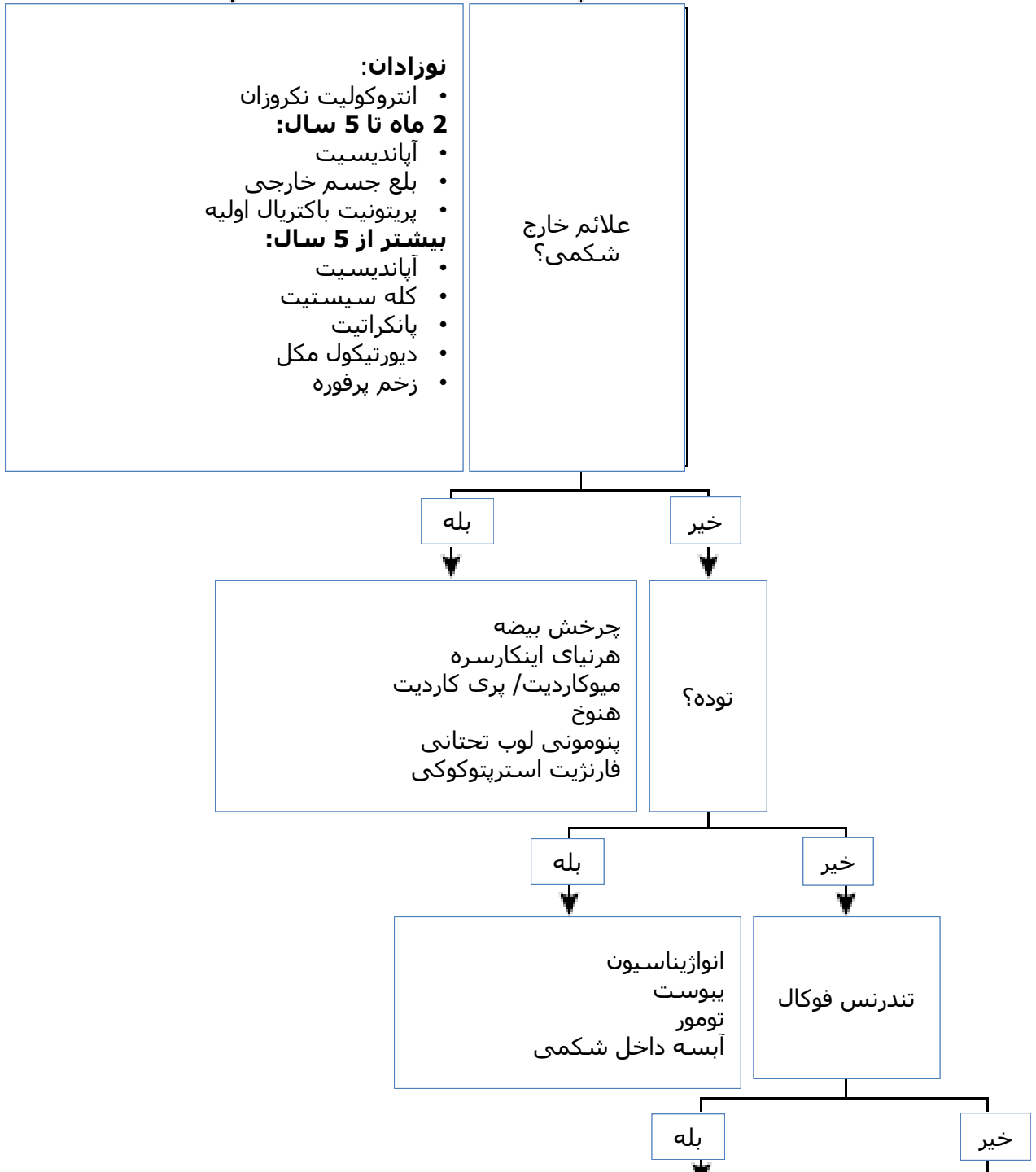


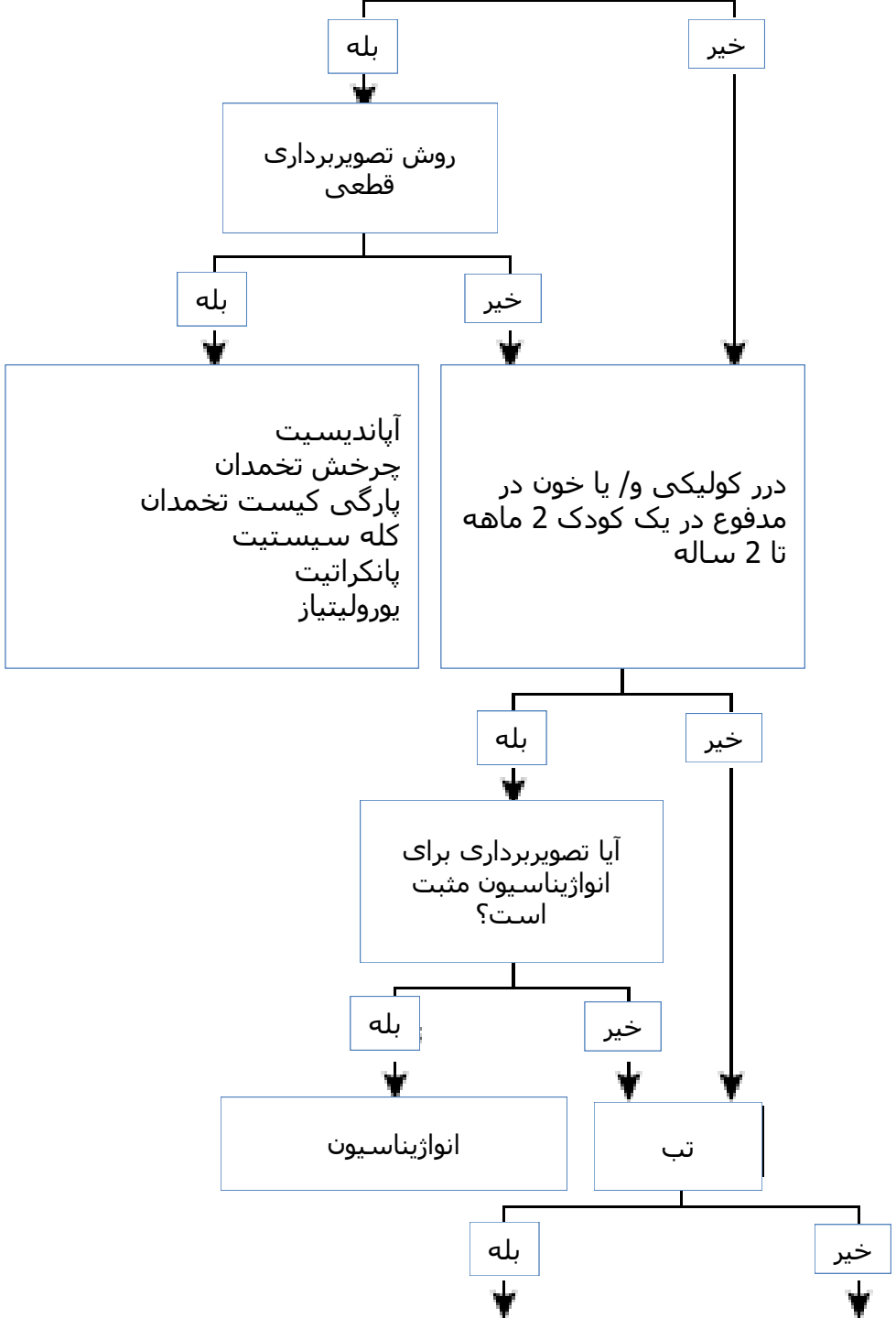
Barium contrast enema showing intussusception in mid-transverse colon (arrow); the patient is in a prone position.

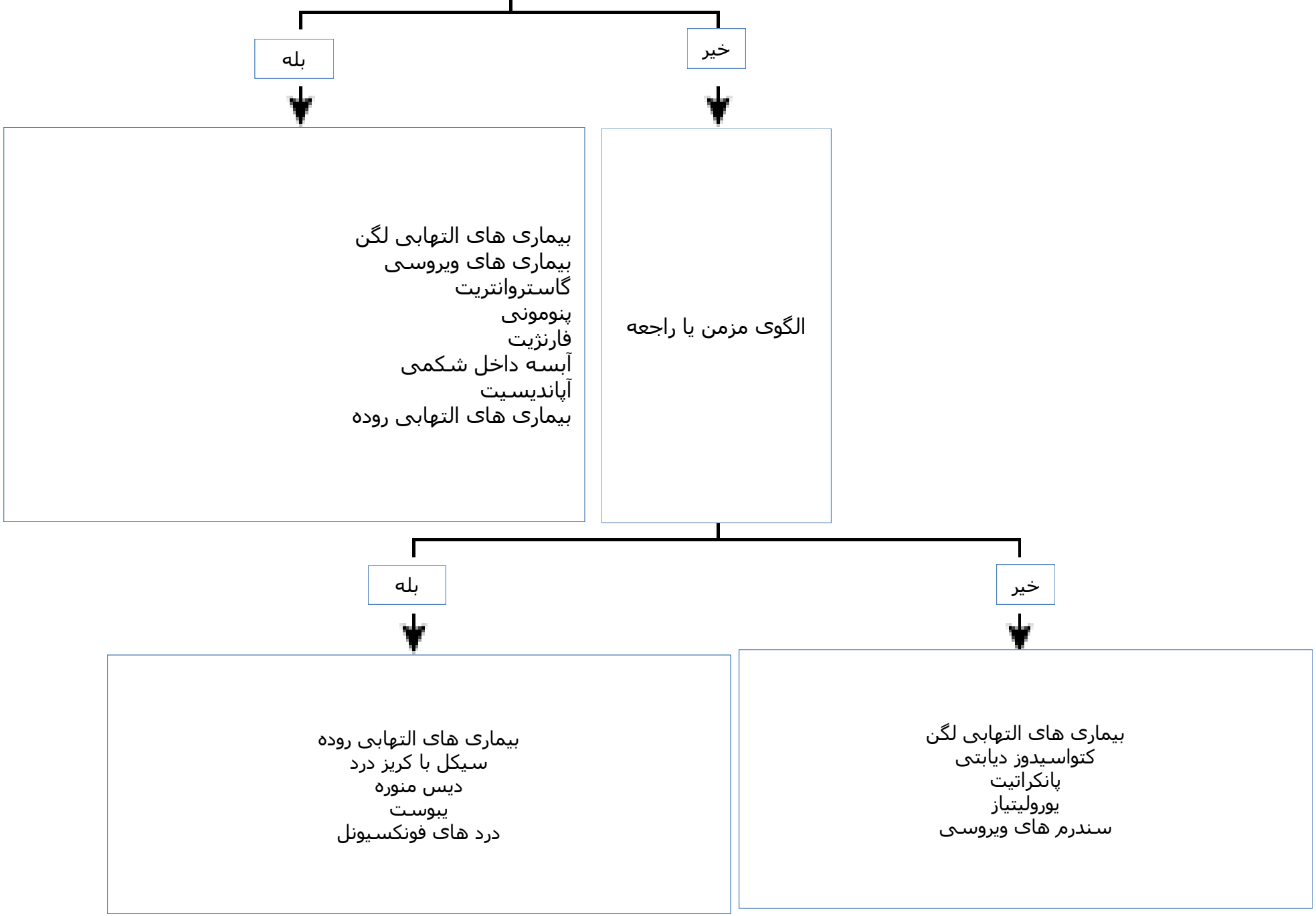
Courtesy of Nancy Fitzgerald, MD and Taylor Chung, MD.

Acute abdominal pain: Males and premenarchal females

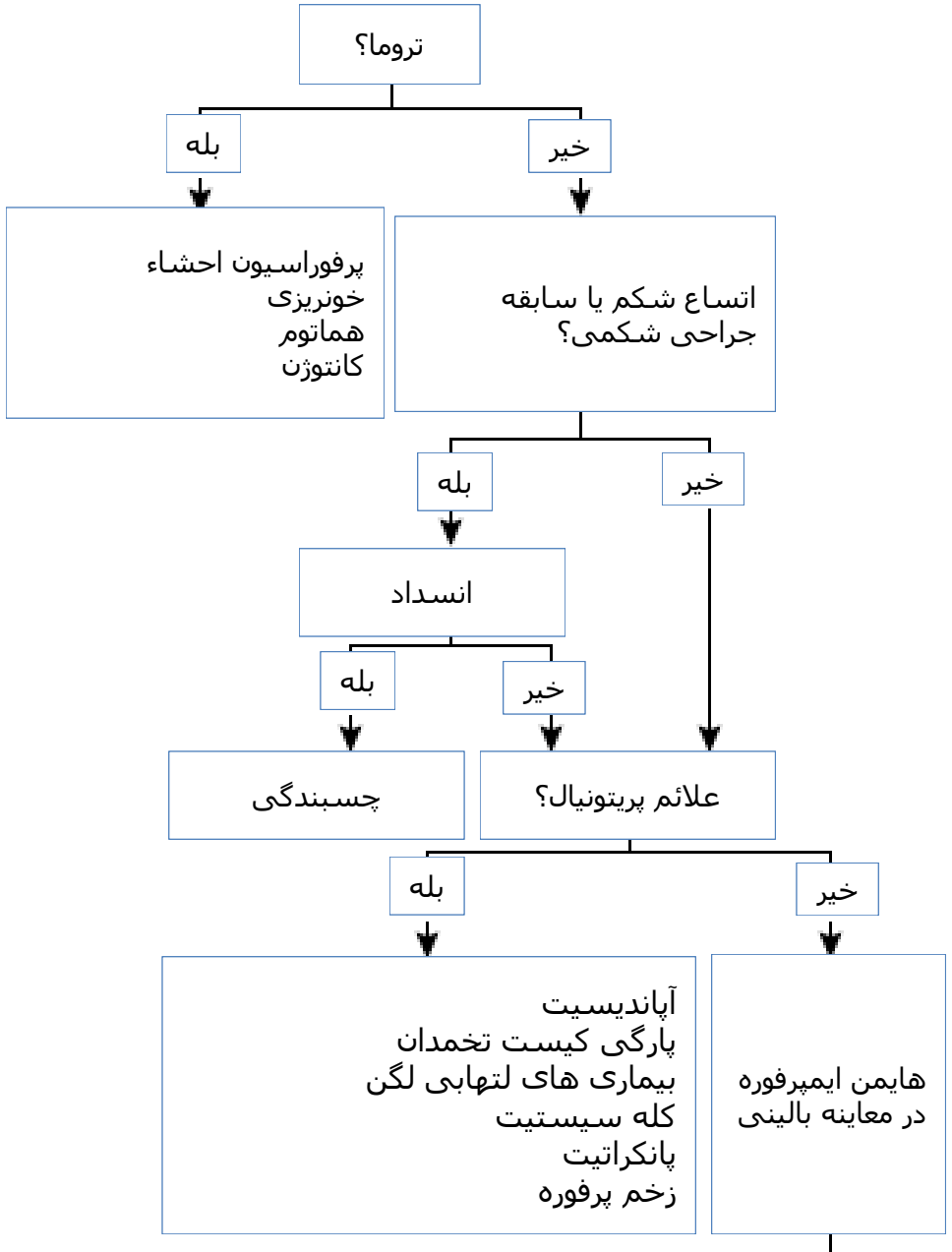


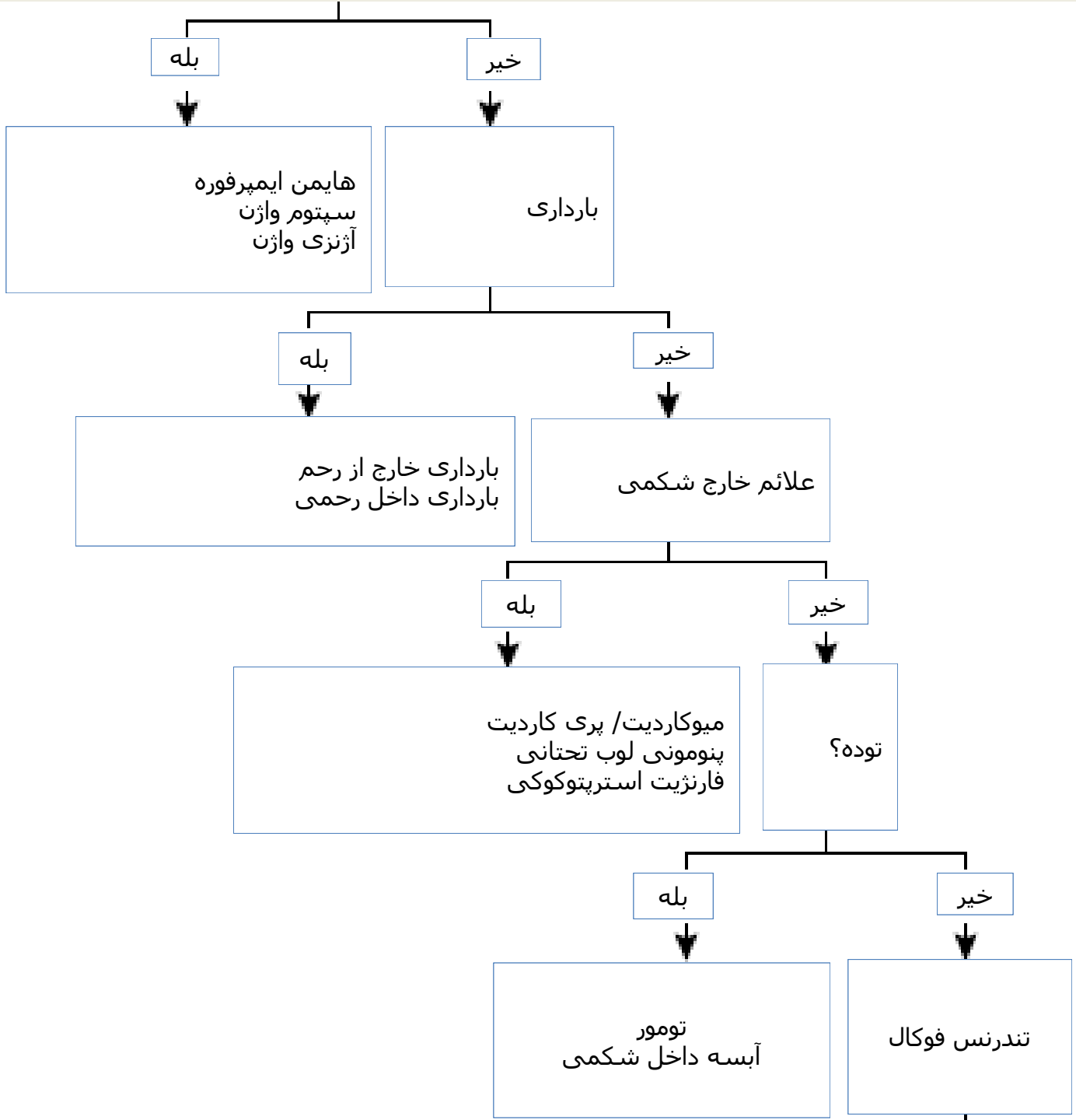

علائم خارج شکمی؟
نوزادان:
• انتروکولیت نکروزان
2 ماه تا 5 سال:
• آپاندیسیت
• بلع جسم خارجی
• پریتونیت باکتریال اولیه
بیشتر از 5 سال:
• آپاندیسیت
• کله سیستیت
• پانکراتیت
• دیورتیکول مکل
• زخم پرفوره
بله
خیر
تووده؟
چرخش بیضه
هرنیای اینکارسره
میوکاردیت/ پری کاردیت
هنوخ
پنومونی لوب تحتانی
فارنژیت استرپتوکوکی
بله
خیر
انواژیناسیون
یبوست
تومور
آبسه داخل شکمی
تندرنس فوکال
بله
خیر

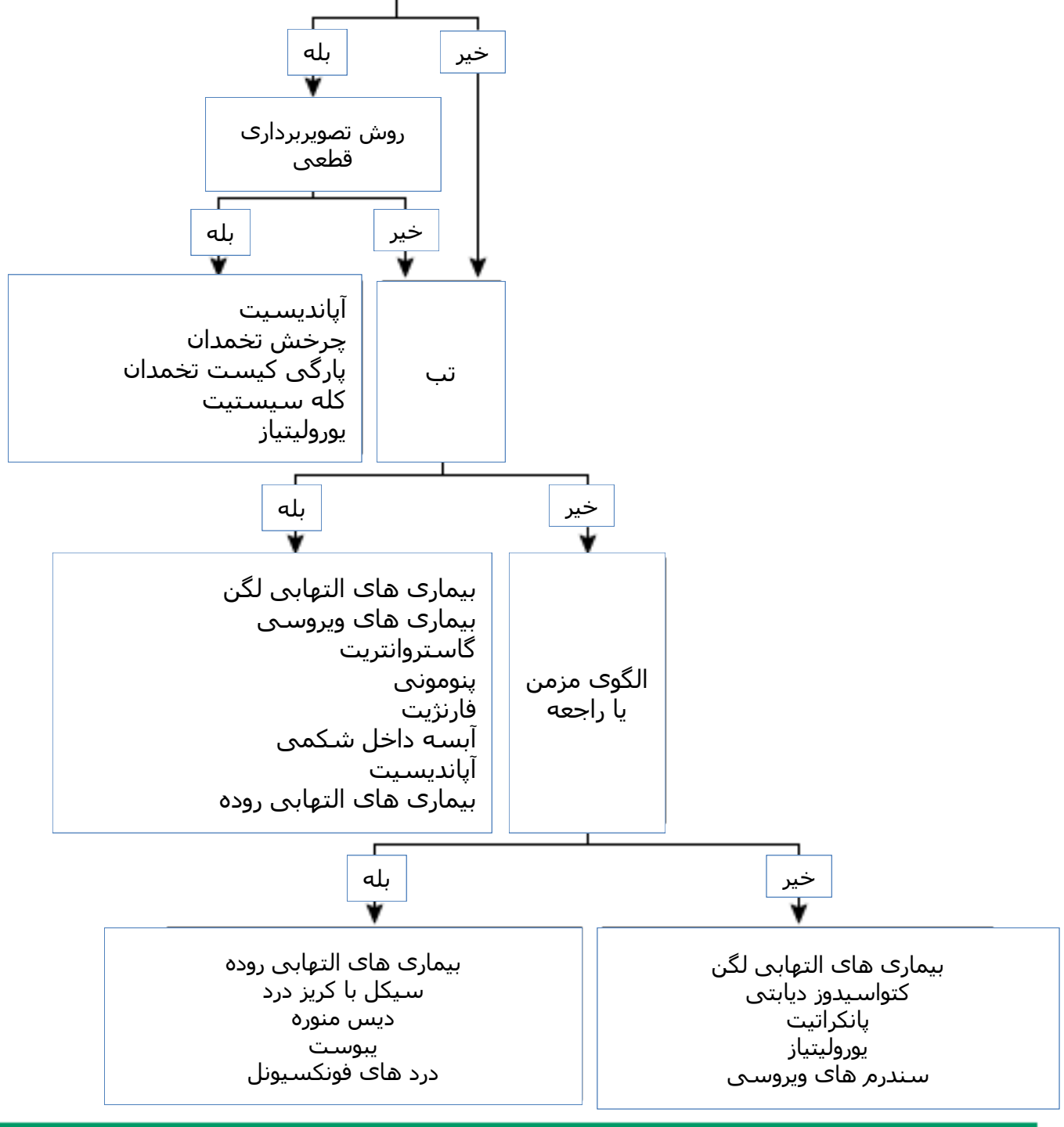

بله
خیر
روش تصویربرداری قطعی
بله
خیر
آپاندیسیت
چرخش تخمدان
پارگی کیست تخمدان
کله سیستیت
پانکراتیت
یورولیتیاز
درد کولیکی و/ یا خون در مدفوع در یک کودک 2 ماهه تا 2 ساله
بله
خیر
آیا تصویربرداری برای انواژیناسیون مثبت است؟
بله
خیر
انواژیناسیون
تب
بله
خیر


بله
خیر
بیماری های التهابی لگن
بیماری های ویروسی
گاستروانتریت
پنومونی
فارنژیت
آبسه داخل شکمی
آپاندیسیت
بیماری های التهابی روده
الگوی مزمن یا راجعه
بله
خیر
بیماری های التهابی روده
سیکل با کریز درد
دیس منوره
یبوست
درد های فونکسیونل
بیماری های التهابی لگن
کتواسیدوز دیابتی
پانکراتیت
یورولیتیاز
سندرم های ویروسی

Acute abdominal pain in postmenarchal girls




بله
خیر
هایمن ایمپرفوره
سپتوم واژن
آژنزی واژن
بارداری
بله
خیر
بارداری خارج از رحم
بارداری داخل رحمی
علائم خارج شکمی
بله
خیر
میوکاردیت/ پری کاردیت
پنومونی لوب تحتانی
فارنژیت استرپتوکوکی
توده؟
بله
خیر
تومور
آبسه داخل شکمی
تندرنس فوکال


بله
خیر
روش تصویربرداری قطعی
بله
خیر
آپاندیسیت
چرخش تخمدان
پارگی کیست تخمدان
کله سیستیت
یورولیتیاز
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پانکراتیت
یورولیتیاز
سندرم های ویروسی

Thanks!

Any questions?