Table 4. Additional Causes of RLQ Pain in Women of Child-Bearing Age

CONDITION	HISTORY/PHYSICAL EXAMINATION	LABORATORIES/IMAGING	MANAGEMENT/DISPOSITION
Mittelschmerz	Cyclic pelvic pain	Normal laboratory and imaging studies	Prostaglandin synthetase inhibitors (non-steroidal antiinflammatories) have been used Can follow up with gynecologist
Dysmenorrhea	Painful menses - cramping pain Pain can radiate to anterior thigh or sacral regions	Normal studies	Prostaglandin synthetase inhibitors, oral contraceptive pills, and non-steroidal antiinflammatories have been used[63] Can follow up with gynecologist
Endometriosis	Dysmenorrhea, dyschezia, dyspareunia Chronic pelvic pain Examination may be normal	May have anemia if menometrorrhagia Laparoscopy is diagnostic	Agents that suppress ovulation have been used Can follow up with gynecologist
Uterine Mass/ Malignancy Fibroids	Pelvic pain and/or mass	May have anemia if menometrorrhagia Ultrasound CT scan	Refer to a gynecologist May need to consult gynecology in the ED if significant bleeding.
Cervical cancer	Abnormal uterine bleeding (postmenopausal, postcoital) May be found incidentally on pelvic examination	Ultrasound or CT scan to define mass	Arrange prompt outpatient workup and definitive diagnosis. May need to consult gynecology in the ED if significant bleeding.
Gastroenteritis (viral and bacterial)	May have sick contacts or be epidemic Exposure to raw/uncooked, or poorly refrigerated food Nausea, vomiting, and diarrhea	May show signs of dehydration Imaging usually normal	Oral or intravenous rehydration. Most are self-limited and do not require antibiotics Antimotility agents generally not needed nor recommended Consider admitting those in the extremes of age and the immunocompromised
Hernia	Palpable mass/bulge Signs/symptoms of obstruction if incarcerated Signs/symptoms of infection/peritonitis if strangulated	Acute abdominal series if obstruction suspected CT scan Ultrasound can help define the mass	Attempt reduction with sedation, analgesia, and Trendelenburg position Consult surgery if incarcerated or strangulated Refer to surgery if symptomatic (pain) but no complications
Musculoskeletal	Pain worse with certain positions or movements	Normal laboratory and imaging studies	Pain control: acetaminophen and NSAIDs, opioids Most are treated as outpatients. Consider admission if: neurologic deficit, elderly, poor social support, suspicion of infection or malignancy
Herpes Zoster	Burning pain Rash may be present (vesicles with erythematous base in crops); dermatomal distribution	Clinical diagnosis	Topical analgesics and antipruritics. Consider treating with antivirals (acyclovir, valacyclovir, famciclovir) the immunocompromised and those > 50 years old. Antivirals (decrease incidence) and vaccination (preventive) for post-herpetic neuralgia

(*Continued*)

Table 4. Additional Causes of RLQ Pain in Women of Child-Bearing Age (continued)

CONDITION	HISTORY/PHYSICAL EXAMINATION	LABORATORIES/IMAGING	MANAGEMENT/DISPOSITION
Pyelonephritis	Flank pain, fever, shaking chills, nausea, vomiting, dysuria Costovertebral angle (CVA) tenderness	Urinalysis shows infection (WBCs, nitrites, leukocyte esterase) CT scan without IV contrast may show stones; with contrast may show stranding, perinephric abscess or gas (emphysematous pyelonephritis)	Antibiotics Supportive: rest, antipyretics, hydration, antiemetics, analgesics. Admit those who: look toxic, do not tolerate oral intake, failed outpatient treatment, are pregnant, have unstable vital signs, significant comorbidities, unsafe social situation.
Epiploic appendagitis	Can mimic acute appendicitis	Ultrasound can show noncompressible oval mass next to the colon CT scan with oral and IV contrast	Analgesia as needed Spontaneously resolves. Ensure that surgical diagnoses, especially acute appendicitis, are excluded.
Porphyria	Intermittent abdominal pain, neuropathies, constipation, personality changes	Elevated urine porphyrins (including porphobilinogen) Imaging is usually normal	Admit all except those with mild attacks High carbohydrate diet, intravenous glucose. Hematin 4 mg/kd/day Goal is to decrease heme synthesis and the production of porphyrin precursors Narcotics for pain.
Irritable bowel syndrome	Recurrent abdominal pain and bloating Change in stool frequency and/or consistency Diagnosis follows the Rome criteria (Recurrent abdominal pain or discomfort 3 days per month in the last 3 months associated with 2 or more of the following: improvement with defecation; and/or onset associated with a change in stool frequency; and/or onset associated with a change in form [appearance] of stool.)	Normal laboratory and imaging studies	Often need outpatient multifaceted approach: antispasmodics for cramping, antidepressants, loperamide for diarrhea, patient support groups and other non-pharmacologic interventions may help.[63]
Inflammatory bowel disease	Bloody diarrhea and abdominal pain Signs and symptoms of obstruction Weight loss Fatigue Crohn's: fistulas	CT scan with oral and IV contrast: inflammation, obstruction, megacolon (ulcerative colitis) Anemia Extraintestinal manifestations: arthritides, rashes	Admit if : dehydrated, uncontrolled pain, unable to tolerate food, failure of outpatient treatment, strictures with obstruction, abscess. Refer for colonoscopy if no complications Aminosalicylic acid derivatives are first choice, steroids next. Immunomodulators have also been used.
Psychogenic	Normal or inconsistent physical examination	Normal laboratory and imaging studies	Exclude all life-threatening, disabling, and treatable medical conditions Provide emotional support to patient and family Refer to a primary care physician and to a psychiatrist

Table 5. Additional Causes of RLQ Pain in Pre-Menarchal Females

CONDITION	HISTORY/PHYSICAL EXAMINATION	LABORATORIES/IMAGING	MANAGEMENT/DISPOSITION
Meckel's diverticulum	Abdominal pain and lower gastrointestinal bleeding (can be painless) Signs of intestinal obstruction Signs of diverticular inflammation	Anemia if significant bleeding Plain films may show obstruction Meckel scan (technetium Tc99m pertechnetate scintiscan) will detect gastric tissue in the Meckel's	Supportive treatment. May need transfusions if significant bleeding Consult surgery for admission and resection
Intussusception	Colicky abdominal pain and vomiting Asymptomatic periods Lethargy (late) "Currant jelly" stools Can have sausage-shaped mass in the right upper quadrant	Contrast enema (can be diagnostic and therapeutic) Ultrasound can visualize intussusceptum Plain films can show obstruction or perforation	Supportive treatment. Evaluate for a mechanical lead point (mass). Admit even if reduction is achieved with barium enema, as up to 10% can have recurrence in the next 24 hours. Reduction usually made in consultation with a surgeon, as complications may arise that may require immediate surgery.
Henoch Schonlein purpura	Abdominal pain (colicky), bloody diarrhea, arthralgias, rash (palpable purpura, more in buttocksand legs), nephritis (hematuria and/or proteinuria)	Urinalysis with hematuria and/or proteinuria CBC with leukocytosis and thrombocytosis Serum IgA levels are increased in 50% of patients Plain films and CT scan can show obstruction or intussusception	Supportive management Can use NSAIDs for pain control. Admit those who appear ill, have severe pain, significant gastrointestinal bleeding, and those with renal involvement; some require steroids.
Cyclic vomiting/ abdominal migraine (migraine equivalent)	Family history of migraine is common Paroxysmal mid-abdominal pain and vomiting. Aura and headaches can be minimal or absent.	Normal laboratory and imaging studies	Antiemetics may help with the acute attack. Most resolve with sleep. Refer to a neurologist to establish the diagnosis, as some may require prophylaxis
Urinary tract infection	Urgency, frequency, hesitancy Dysuria Hematuria No fever	Urinalysis with white blood cells, nitrites, leukocyte esterase Positive urine culture	Most can be treated as outpatients with 3 days of antibiotics: Bactrim is first choice when local resistance is low; fluoroquinolones if resistance is high or infection is complicated; nitrofurantoin (Macrodantin); amoxicillin/clavulanate (Augmentin) Can offer a urinary analgesic if dysuria is significant, like (phenazopyridine [Pyridium]) Admit the elderly or immunocompromised who may present with a sepsis syndrome. Treat pregnant women for up to 14 days. Cephalexin (Keflex) is commonly used.
Mesenteric adenitis	Acute right lower quadrant pain May be indistinguishable from acute appendicitis Fever	Ultrasound with graded compression: normal appendix and enlarged lymph nodes CT scan with oral and IV contrast Is a diagnosis of exclusion	Self-limited disease Make sure surgical causes of abdominal pain are excluded, especially acute appendicitis.

(*Continued.*)

Table 5. Additional Causes of RLQ Pain in Pre-Menarchal Females (Continued)

CONDITION	HISTORY/PHYSICAL EXAMINATION	LABORATORIES/IMAGING	MANAGEMENT/DISPOSITION
Toxic, i.e., lead poisoning	Changes in behavior Abdominal pain with constipation	Anemia Elevated free erythrocyte protoporphyrin levels Elevated blood lead level Radiographs may show lead lines (children) or radio-opaque foreign bodies in the gastrointestinal tract	Decontaminate as needed Admit to ICU those with encephalopathy Chelation indicated for children with levels between 45-70 mcg/dL and adults between 70-100 mcg/dL Chelators: BAL, calcium disodium EDTA succimer Remove from the source

Table 6. Additional Causes of RLQ Pain in Post-Menopausal Females

CONDITION	HISTORY/PHYSICAL EXAMINATION	LABORATORIES/IMAGING	MANAGEMENT/DISPOSITION
Abdominal aortic aneurysm (AAA)	Most are asymptomatic until rupture Can present with back, flank, or groin pain Can present with syncope or shock A pulsatile abdominal mass is virtually diagnostic, but not often found	Ultrasound is sensitive, good for screening, can be performed at the bedside CT scan is best for details but requires a stable patient	Treat shock if present Type and crossmatch Control blood pressure and heart rate to decrease vessel wall tension Immediate vascular surgery consultation for all symptomatic AAAs
Diverticulosis/itis (typically LLQ)	History of constipation or recent change in bowel movements Fever if infected May have lower gastrointestinal bleeding with R sided diverticuli	Leukocytosis if infected Anemia if significant bleeding Acute abdominal series may show free air if perforated CT scan with IV and oral contrast	Those with mild diverticulitis: can be discharged with liquid diet and oral antibiotics (ciprofloxacin and metronidazole are commonly used) Admit if: toxic appearing, fails outpatient management, poor pain control, peritonitis, immunocompromised, unable to tolerate food. Diverticular abscesses > 5 cm need to be drained
Intestinal ischemia	Severe abdominal pain with paucity of clinical findings Can have symptoms of "intestinal angina" Nausea, vomiting, and diarrhea are commonly present Advanced ischemia/necrosis: distention, ileus, peritonitis, shock Risk factors: atrial fibrillation, hypoperfusion, vasoconstriction, atherosclerosis, hypercoagulable states	Laboratory studies are often nonspecific and unreliable until late in the course of the disease -leukocytosis -elevated lactate -elevated D-dimer Plain films are nonspecific or normal -may show perforation or obstruction -pneumatosis intestinalis, portal vein gas, and thumbprinting are late Multidetector CT scans are good at detecting mesenteric ischemia Angiography is the gold standard, and can be both diagnostic and therapeutic	Intestinal angina: no effective treatment exists, but angioplasty with/without stenting has been used, as well as mesenteric revascularization Angiography can be both diagnostic and therapeutic in cases of thrombosis or embolism Non-occlusive ischemia: identify and correct the underlying cause (vasospasm, hypovolemia, low flow state) Laparotomy is indicated to remove necrotic bowel. Admit all patients to the Intensive Care Unit.

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Table 6. Additional Causes of RLQ Pain in Post-Menopausal Females (continued)

CONDITION	HISTORY/PHYSICAL EXAMINATION	LABORATORIES/IMAGING	MANAGEMENT/DISPOSITION
GI malignancy - colon cancer	Abdominal pain, altered bowel habits, change in stool caliber, occult blood, bowel signs and symptoms of obstruction	CT scan will show mass, obstruction, and presence of metastases	Arrange prompt outpatient workup and definitive diagnosis. May need admission if obstructed or significant bleeding
Obstruction small bowel	Vomiting, abdominal pain and distention Absence of bowel movements and/or flatus	Plain films (acute abdominal series): dilated bowel loops with air-fluid levels; absent colonic gas; free air if perforated CT scan: dilated bowel loops adjacent to collapsed loops	Place nasogastric tube for decompression. Volume resuscitate Use antiemetics and analgesics as needed. Early surgical consultation for admission and further management
Obstruction Small bowel Large bowel Volvulus Sigmoid Cecal Intussusception Acute colonic pseudo-obstruction (Ogilvie's syndrome)	Vomiting, abdominal pain and distention Absence of bowel movements and/or flatus Sudden onset of symptoms may represent a volvulus	Plain films (acute abdominal series): dilated colon; "kidney bean" appearance in volvulus; free air if perforated CT scan	Supportive management: fluid resuscitation, nasogastric tube placement, use of analgesia and antiemetics Antibiotics are generally recommended Early surgical consultation and admission Sigmoidoscopy can reduce a sigmoid volvulus Pesudo-obstruction is managed with bowel rest, intravenous hydration, and treating the underlying disorders.