

# Diarrhea

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## Definition

**Diarrhea:** the passage of loose or watery stools for typically 4 least 24 hours reflecting increased water content in the stool secondary to impaired absorption and/or increased secretion

**Acute:** <14 days

**Chronic:** >30 days

**Subacute/persistent:** 14-30 days

## Assessment

### On history, ask about:

- Sick contacts/recent illness
- Recent travel
- Antibiotic use
- Common eating places if someone else with similar symptoms
- Dietary changes
- Associated nausea and vomiting
- Weight loss
- Blood in stool
- Pain in relation to defecation
- Constipation
- Supplements/medications/recreational drugs
- Mood/stressors
- Relation to menstruation
- Consider using Bristol Stool Chart to document stool consistency

### Physical exam

- Hydration status
  - o Especially critical in children who are at risk of dehydration due to increased surface area:volume, increased respiratory rate, and increased metabolic rate. Globally, 1 in 9 child deaths under age 5 are due to diarrhea.
- Vitals
- Abdominal exam
- Consider a full rectal exam

Physical findings of volume depletion in infants and children

Finding	Mild (3 to 5%)	Moderate (6 to 9%)	Severe (≥10%)
Pulse	Full, normal rate	Rapid*	Rapid* and weak <b>or</b> absent
Systolic pressure	Normal	Normal to low	Low
Respirations	Normal	Deep, rate may be increased	Deep, tachypnea <b>or</b> decreased to absent
Buccal mucosa	Tacky or slightly dry	Dry	Parched
Anterior fontanelle	Normal	Sunken	Markedly sunken
Eyes	Normal	Sunken	Markedly sunken
Skin turgor	Normal	Reduced	Tenting
Skin	Normal	Cool	Cool, mottled, acrocyanosis
Urine output	Normal or mildly reduced	Markedly reduced	Anuria
Systemic signs	Increased thirst	Listlessness, irritability	Grunting, lethargy, coma

\* Tachycardia may be the first sign of hypovolemic shock in infants.

Graphic 76198 Version 8.0

## Red flags (Acute)

- Bloody diarrhea
- Very sick patient
- Immunocompromised

## Red flags (Chronic)

- First presentation at age > 50 without age-appropriate colon screening
- Weight loss
- Signs or symptoms of rectal bleeding or iron deficiency anemia
- Palpable lymphadenopathy or masses
- Nocturnal symptoms
- History of recent antibiotic use
- Family history of colorectal carcinoma in the absence age-appropriate colon screening

## Initial Investigations

1. CBC
2. Extended Electrolytes
3. Renal function
4. LFT's
5. TSH
6. Consider CRP if concerned RE: IBD
7. CK
8. Anti-TTG
9. Urinalysis
10. Colonoscopy if red flags present
11. Consider autoimmune and malignancy workup: ANA, CCP, RF, SPEP, ANCA, C3/C4, antiphospholipids
12. Consider infectious workup: Hep B/C, HIV, STI, stool O&P and culture

## Differential diagnosis

### Acute

Diagnosis	History to suggest	Investigations	Treatment
Viral gastroenteritis	Sick contact Other features of viral illness +/- vomiting	Bloodwork is only required if they are sick enough for IV fluids or in chronic cases	Hydration Supportive See treatment section below
Bacterial gastroenteritis	Travel New/poorly prepared food Other family members affected +/- vomiting	Stool culture and O&P Bloodwork is only required if they are sick enough for IV fluids or in chronic cases	Hydration Supportive May consider antibiotics i.e. ciprofloxacin or azithromycin if related to travel  Caution: if you suspect EHEC, DO NOT GIVE ANTIBIOTICS as you may precipitate HUS  See treatment section below
C difficile	History of antibiotic use, especially clindamycin, cephalosporins, ciprofloxacin (remember the C's)	C diff immunoassay/NAAT Electrolytes  CBC (leukocytosis) – an indicator of disease severity	Vancomycin 125 mg PO QID (unless lab results will take >48 hours to return, wait until you know they have c diff)

	>70 PPI use Obesity Recent hospitalization	Albumin and lactate can indicate disease severity  If severe disease: consider x-ray/CT to look for megacolon, wall thickening, stranding, or ascites  Colonoscopy not necessary but may indicate pseudomembranous colitis	Fidaxomicin is a reasonable alternative  Consider stool transplant if 2+ episodes  Infection control: hand hygiene  If fulminant colitis (hypotension, shock, ileus, megacolon) get them to the hospital for treatment
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## Chronic

Diagnosis	Pertinent positives	Investigations	Diagnosis	Treatment
Irritable bowel syndrome	Alternating constipation and diarrhea Associated with pain No red flags <i>Associated with stress</i> <i>Extra gastrointestinal symptoms including:</i> headache, dysmenorrhea, dyspareunia, fatigue	If no red flags, not needed	<b>Rome IV Criteria</b> Recurrent abdominal pain (occurring on average at least 1 day per week in the previous 3 months, with the onset of symptoms occurring at least 6 months before diagnosis) with at least 2 of the following: a. Related to defecation b. Associated with a change in stool frequency, and/or c. Associated with a change in stool appearance.  <b>IBS-D</b> (diarrhea predominant) <b>IBS-C</b> (constipation predominant) <b>IBS-M</b> (mixed)	Constipation: hydration, fibre, psyllium, PEG, prokinetics  Diarrhea: antispasmodics (buscopan), peppermint oil, TCA, SSRI  For both, including symptoms of pain and bloating:  Stress reduction, sleep hygiene  Consider CBT, low fodmaps diet, probiotics, rifaximin, ondansetron  *loperamide for short term use only*  See below for flow chart
Carbohydrate malabsorption (usually lactose intolerance)	Bloating and gas Associated with dairy	None needed	No red flags Improves with removal of causative agents	Remove causative agent from diet: usually dairy, alcohol, sugars
Crohns Disease	Pain Family history Weight loss Autoimmune history Extragastrointestinal manifestations i.e. erythema nodosum, arthritis, uveitis	Colonoscopy Electrolytes Ferritin CRP	Referral to gastroenterology Diagnosis based on scope and pathology	Steroids Anti-inflammatories Biologics Surgery
Ulcerative colitis	Bloody stools Pain Weight loss	Colonoscopy Electrolytes Ferritin	Referral to gastroenterology	Steroids Anti-inflammatories Biologics

	Family history Other autoimmune disease	CRP	Diagnosis based on scope and pathology	Surgery
Celiac disease	Weight loss Malnutrition Triggered by gluten History of T1DM	Colonoscopy Electrolytes Ferritin CRP Anti-TTG	Improves with removal of gluten Consider referral to gastroenterology	Gluten-free diet
Bile acid diarrhea	May have history of IBS, Crohn's, celiac, or pancreatic disease  Cholecystectomy	Not many investigations for this	No red flags Consider referral to gastroenterology	cholestyramine
Drug reactions/side effects	Triggering medications: metformin, antibiotics	Initial investigations as above	No red flags Improves with cessation of medication/drug	Changes or eliminate the drug or medication
Malignancy	Family history Lynch syndrome Blood in stool Anemia Red flags as above	Initial investigations as above Colonoscopy Consider CEA	Red flags Colonoscopy and pathology  Refer to surgeon/oncologist	Chemo/Radiation/Surgery

## Treatment

### Acutely: Rehydration

1. Mild to moderate dehydration
  - a. Oral rehydration therapy (ORT): utilizes fluids based on a WHO formula containing glucose, sodium, and potassium
    - i. Remember the SGLT1 channel? Glucose helps with the absorption of Na which pulls in fluid
    - ii. This may include Pedialyte, enfalyte etc.
  - b. Half strength apple juice: can be considered in the most mild cases as it has been shown to reduce treatment failure
2. Severe dehydration
  - a. IV fluids
    - i. For children, remember the 4-2-1 rule
      1. 4ml/kg for the first 10 kg
      2. 2ml/kg for the second 10 kg
      3. 1ml/kg for every kg thereafter
3. Avoid these fluids
  - a. Water: risk of hyponatremia and hypoglycemia
  - b. Gatorade: too much sugar, not enough salt
  - c. Juice: too much sugar, not enough salt
  - d. Soda: only sugar
  - e. Tea: basically water and possibly also a diuretic if caffeinated
  - f. Homemade formulas: but, in a pinch, the WHO has a recipe for emergency situations where premade replacements are not available with 1L of clean water, 8 tsp sugar, 4 tsp salt, and 1 cup of orange juice

### After rehydration

1. Consider antibiotics (Look at your local antibiogram but typically azithromycin or ciprofloxacin)
  - a. Severe disease with fever, >6 stools/day, volume depletion warranting hospitalization
  - b. Features suggestive of invasive bacterial infection such as bloody/mucoid diarrhea

- i. BUT AVOID IF SUSPECTING EHEC DUE TO RISK OF HUS: infant/toddler with bloody diarrhea, abdominal pain, mild or no fever, history of raw meat or raw vegetable consumption
  - c. Host factors that increase the risk of complications such as >70 or comorbidities including immunocompromised state or cardiac disease
2. Probiotics
    - a. Won't hurt but generally not recommended
  3. Antidiarrheals i.e. loperamide
    - a. Avoid in children
    - b. May be useful for up to 48 hours in mild illness with watery, non-bloody diarrhea or moderate to severe disease that is not associated with travel or fever.
  4. Antiemetics
    - a. Ondansetron may improve the success of ORT

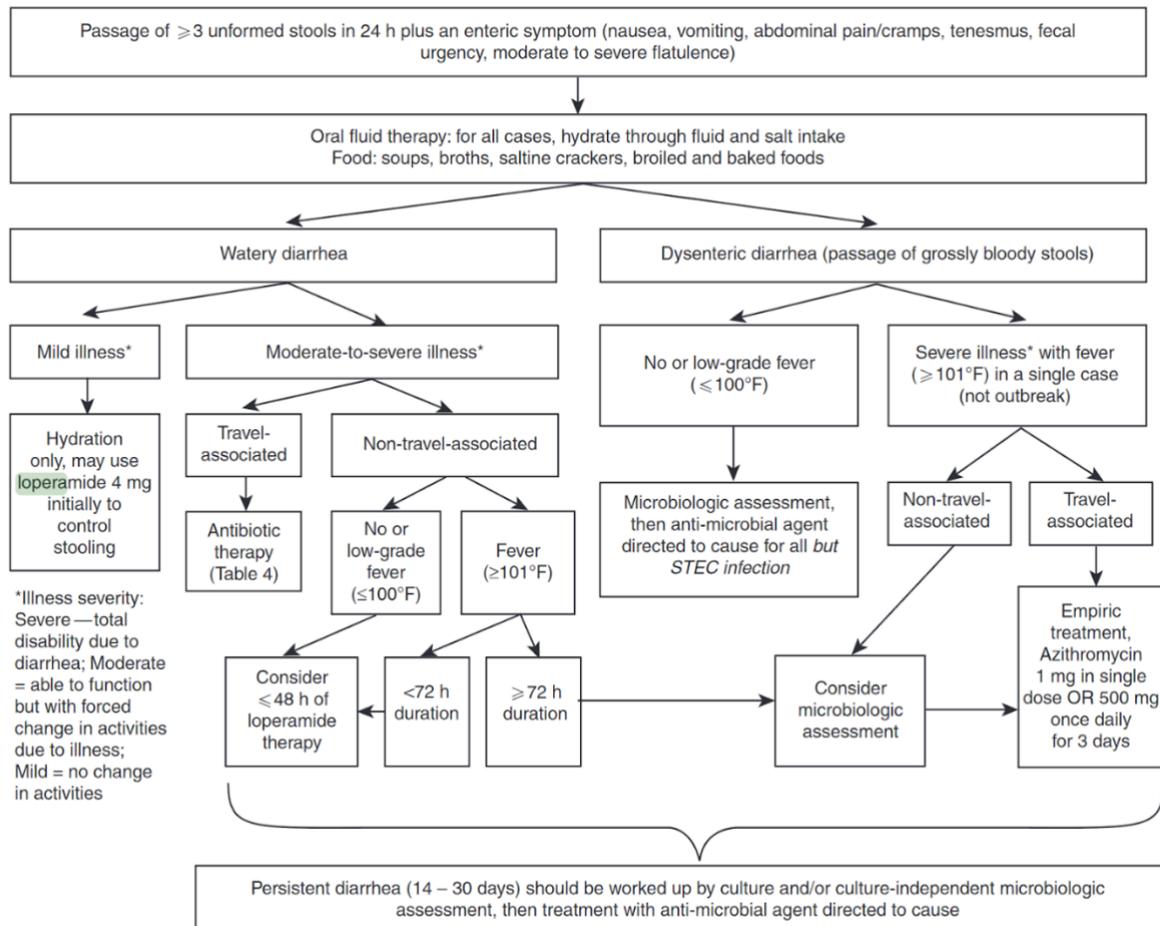
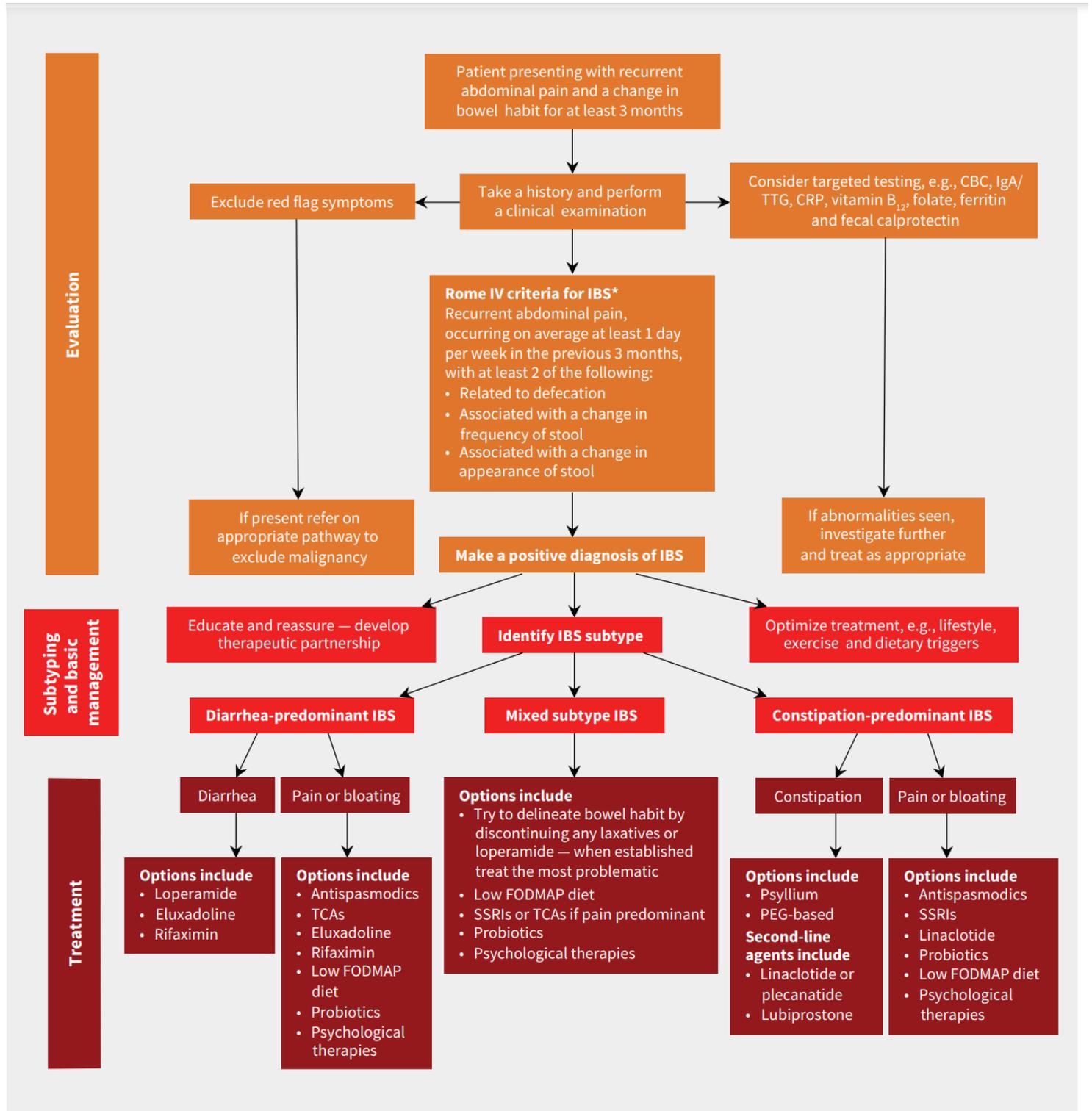


Figure 1. Approach to empiric therapy and diagnostic-directed management of the adult patient with acute diarrhea (suspect infectious etiology).

CMAJ IBS Flow Chart



## Prevention

1. Hygiene
  - a. Wash hands with soap and water
  - b. Safe food preparation
2. Vaccination
  - a. Rotavirus vaccine
3. School
  - a. Wait 48 hours since the last episode of diarrhea to return to school to prevent transmission

## Quick Associations

1. Diarrhea after raw chicken or eggs: Salmonella
2. Hospital acquired, foul-smelling, diarrhea: C. Diff
3. Watery diarrhea in a hiker who drank fresh water: Giardia
4. Watery diarrhea in someone who returned from a buffet that served reheated rice: Bacillus cereus
5. Bloody diarrhea after eating undercooked meat: EHEC; enterohemorrhagic e coli
6. Watery diarrhea in the returned traveler: ETEC; enterotoxigenic e coli. Remember T for traveller, H for hamburger.
7. The most common infectious cause of diarrhea: viral (norovirus, rotavirus, adenovirus - less likely rotavirus since the introduction of the Rotavirus vaccine into routine childhood immunizations)

## Recourses

AAFP article on CDiff: <https://www.aafp.org/afp/2020/0201/p168.html#afp20200201p168-t1>

CMAJ IBS article: <https://www.cmaj.ca/content/cmaj/192/11/E275.full.pdf>