Acute viral gastroenteritis in adults

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INTRODUCTION

Acute viral gastroenteritis is a common cause of illness resulting in visits to the emergency department and outpatient clinics in the United States. In addition, acute viral gastroenteritis causes outbreaks in certain closed communities, such as nursing homes, schools, and cruise ships. Restaurant and catered meals are another common source of outbreaks.

This topic focuses on the management of acute viral gastroenteritis in adults. The approach to acute nonviral diarrhea in adults, chronic diarrhea in adults, and diarrhea in children are discussed separately:

- (See "Norovirus".)
- (See "Approach to the adult with acute diarrhea in resource-abundant settings".)
- (See "Approach to the adult with acute diarrhea in resource-limited settings".)
- (See "Acute viral gastroenteritis in children in resource-abundant countries: Clinical features and diagnosis".)
- (See "Acute viral gastroenteritis in children in resource-abundant countries: Management and prevention".)
- (See "Diagnostic approach to diarrhea in children in resource-abundant settings".)

ETIOLOGY

Most cases of acute infectious gastroenteritis are viral, with norovirus being the most common cause of acute gastroenteritis and the second most common cause of hospitalization for acute gastroenteritis [1-7]. The other common pathogens causing viral gastroenteritis are rotavirus, enteric adenovirus, and astrovirus [8,9]. Other nonviral causes include bacteria (eg, *Staphylococcus aureus*, *Campylobacter jejuni*, *Shigella* spp, *Salmonella* spp, *Yersinia*, and *Escherichia coli*) and parasites (eg, *Giardia* and *Cryptosporidium*).

In addition to large outbreaks from consumption of contaminated food and water, noroviruses are efficiently spread person-to-person [10]. Viral gastroenteritis has pronounced peaks in the winter and spring [9,11-13].

The epidemiology and virology of norovirus gastroenteritis in adults is discussed in detail separately. (See "Norovirus".)

CLINICAL MANIFESTATIONS

History — Acute gastroenteritis is defined as diarrheal disease (three or more times per day or at least 200 g of stool per day) of rapid onset that lasts less than two weeks and may be accompanied by nausea, vomiting, fever, or abdominal pain [3,14,15]. Classically, vomiting and diarrhea occur together; however, less commonly, either can occur alone. In one study, among patients who presented to the emergency department with acute gastroenteritis, the most common symptoms were nausea (93 percent), diarrhea (89 percent), vomiting (81 percent), and abdominal pain (76 percent) [1]. Respiratory symptoms were reported in approximately 10 percent of the subjects and included sore throat, cough, and rhinorrhea [1]. Other symptoms such as weight loss and fatigue have also been reported.

Characteristics of the history that suggest a viral etiology of acute gastroenteritis include: an intermediate incubation period (24 to 60 hours), a short infection duration (12 to 60 hours), and a high frequency of vomiting [16]. However, these epidemiologic criteria for differentiating between outbreaks caused by norovirus and bacterial pathogens may not be as useful for individual patient assessment [17]. As an example, one observational study showed few differences in the clinical presentation between adults with acute gastroenteritis due to viral and bacterial pathogens [1]. The duration of the diarrhea may differ among viral and bacterial acute gastroenteritis. Norovirus infection usually lasts a median of two days, rotavirus infection three to eight days, and *Campylobacter* and *Salmonella* two to seven days [18]. Viral gastroenteritis does not typically cause bloody diarrhea.

The clinical manifestations of gastroenteritis caused by specific viral pathogens are discussed separately. (See "Clinical manifestations and diagnosis of rotavirus infection", section on 'Clinical manifestations' and "Norovirus", section on 'Clinical manifestations'.)

Physical examination — Common findings on physical examination of patients with acute viral gastroenteritis include mild diffuse abdominal tenderness on palpation; the abdomen is soft, but there may be voluntary guarding. Fever (38.3 to 38.9°C [101 to 102°F]) occurs in approximately one-half of patients [19].

While relatively uncommon, it is important to identify signs of moderate to severe dehydration, including dry mucous membranes, decreased skin turgor, tachycardia, hypotension, or altered mental status. These were present in fewer than 10 percent of patients presenting to the emergency department with acute gastroenteritis in one study [1].

Alarm symptoms and signs — Clinical features or alarm symptoms and signs ("red flags") (table 1) that identify patients who may need hospitalization or evaluation for other causes include [14,18,20]:

- Severe volume depletion/dehydration
- Abnormal electrolytes or renal function
- Bloody stool/rectal bleeding
- Weight loss
- Severe abdominal pain
- Prolonged symptoms (more than one week)
- Hospitalization or antibiotic use in the past three to six months
- Age 65 or older
- Comorbidities (eg, diabetes mellitus, immunocompromised)
- Pregnancy

DIAGNOSIS

Clinical diagnosis — The diagnosis of acute viral gastroenteritis is made by a characteristic history of diarrheal disease (three or more times per day or at least 200 g of stool per day) of rapid onset that lasts less than one week and may be accompanied by nausea, vomiting, fever, or abdominal pain and characteristic physical examination of mild, diffuse, abdominal tenderness [3,14].

Laboratory testing — Routine laboratory and stool studies (eg, fecal leukocytes, lactoferrin) are not required for the diagnosis of acute viral gastroenteritis; it is not necessary to determine

a specific viral diagnosis. Stool studies are not routinely necessary in patients with viral gastroenteritis and are typically negative for fecal leukocytes and occult blood. Stool culture is also negative for bacterial pathogens. The presence of fecal leukocytes, occult blood, lactoferrin, or positive stool culture all indicate an inflammatory, nonviral gastroenteritis.

However, stool studies should be obtained in the following situations: adults presenting with persistent fever, dehydration, blood or pus in the stool, or other alarm symptoms and signs (table 1), and when there is clinical suspicion of a nonviral, inflammatory etiology of acute gastroenteritis. Diarrhea that lasts for more than a week should also prompt consideration of infectious and noninfectious causes (algorithm 1) [14]. The diagnostic approach to patients in these settings is discussed in detail separately. (See "Approach to the adult with acute diarrhea in resource-abundant settings", section on 'Evaluation' and "Approach to the adult with acute diarrhea in resource-limited settings", section on 'Clinical assessment'.)

In the absence of signs of volume depletion, it is not necessary to measure serum electrolytes, which are usually normal. If substantial volume depletion is present, clinicians should measure serum electrolytes to screen for hypokalemia or renal dysfunction.

The complete blood count does not reliably distinguish between viral and bacterial gastroenteritis. The white blood cell count may or may not be elevated. In patients with acute viral gastroenteritis with volume depletion, the complete blood count may show signs of hemoconcentration.

DIFFERENTIAL DIAGNOSIS

The differential diagnosis of acute viral gastroenteritis includes other causes (infectious and noninfectious) of acute diarrhea [18,21]. Diarrhea that lasts over a week in an individual with a history of travel, hiking, or oral-anal sexual activity should prompt evaluation for protozoa such as *Giardia* and cryptosporidium [14]. Recent antibiotic use or hospitalization should prompt consideration of *Clostridioides difficile* infection. Common foodborne illnesses (eg, *S. aureus*) need to be considered, particularly when the incubation period is shorter than is typical for viral illness (ie, within 8 to 16 hours). The presence of alarm symptoms or signs should prompt further investigation for an alternate diagnosis. (See "*Clostridioides difficile* infection in adults: Clinical manifestations and diagnosis" and "Causes of acute infectious diarrhea and other foodborne illnesses in resource-abundant settings", section on 'Overview of causes' and "Causes of acute infectious diarrhea and other foodborne illnesses in resource-abundant settings".)

The diagnostic approach to patients with suspected nonviral infectious gastroenteritis is discussed in an algorithm (algorithm 1).

Causes of chronic diarrhea that may less commonly masquerade as acute viral gastroenteritis include colorectal cancer, irritable bowel syndrome, inflammatory bowel disease, microscopic colitis, malabsorption syndromes, post-cholecystectomy related diarrhea, medication-induced diarrhea, laxative abuse, and chronic infections. (See "Approach to the adult with chronic diarrhea in resource-abundant settings", section on 'Etiology'.)

Uncommonly, some patients with acute viral gastroenteritis may present with isolated vomiting. Clinicians should consider adverse effects of medications and acute vestibular disorders in the differential diagnosis of these patients. (See "Approach to the adult with nausea and vomiting", section on 'Acute disorders'.)

TREATMENT

Acute viral gastroenteritis is usually self-limited and is treated with supportive measures (fluid repletion and unrestricted nutrition). No specific antiviral agents are available.

For adults presenting with acute viral gastroenteritis without signs of volume depletion, adequate volume can be maintained with sport drinks and broths. For adults presenting with mild to moderate hypovolemia, oral rehydration solutions may be superior to sports drinks in maintaining electrolyte balance along with hydration. Patients with severe dehydration require intravenous fluids (algorithm 2). (See "Approach to the adult with acute diarrhea in resource-abundant settings", section on 'Fluid repletion'.)

Antiemetics and antimotility agents are used sometimes for excessive vomiting or excessive fluid loss from diarrhea, respectively. In known viral gastroenteritis epidemics, antibiotics are not indicated. Empiric antibiotics may have a limited role in the management of acute gastroenteritis, when it is unclear if the etiology is viral or bacterial. The role of antibiotics in bacterial gastroenteritis is discussed separately. (See "Approach to the adult with acute diarrhea in resource-abundant settings", section on 'Empiric antibiotic therapy'.)

Supportive measures — In the 1960s, the discovery that the intestines of patients with cholera could still absorb water and electrolytes, despite secreting large amounts of fluid, laid the foundation for fluid maintenance and repletion as a mainstay of the management of acute gastroenteritis [22]. To this day, treatment for acute viral gastroenteritis consists primarily of supportive measures.

Fluid maintenance and repletion — For adults presenting with acute viral gastroenteritis without signs of volume depletion, adequate volume can be maintained with sports drinks and broths. Soft drinks and fruit juices that are high in sugar content should be avoided. For adults presenting with mild to moderate volume depletion (table 2), oral rehydration solutions may be superior to sports drinks in maintaining electrolyte balance along with hydration. World Health Organization (WHO) oral rehydration salts (ORS) solution is available from commercial companies. For patients with severe hypovolemia, or an inability to tolerate oral rehydration, repletion with intravenous normal saline or Ringer's lactate is required (algorithm 2).

Oral rehydration has been associated with a higher risk of paralytic ileus while intravenous hydration carries the risk of phlebitis [23,24]. Oral rehydration should not be used if the patient has impaired mental status or abdominal ileus. In resource-poor environments in developing countries, where access to medical care and intravenous fluids may be limited, oral rehydration may be particularly useful.

The principles of oral hydration in adults are based primarily on studies showing a benefit in children [25]. In children, the use of WHO ORS solution decreases the mortality due to acute diarrheal illnesses. There are very limited data in adults. A small randomized trial of 60 adults in India with dehydration from viral gastroenteritis showed that adults randomized to Gatorade, a modified ORS solution, and Pedialyte had similar improvements in diarrheal symptoms and body weight [26]. However, the modified ORS solution and Pedialyte were effective in correcting hypokalemia, whereas the Gatorade was not. (See "Approach to the adult with acute diarrhea in resource-abundant settings", section on 'Fluid repletion' and "Approach to the adult with acute diarrhea in resource-limited settings", section on 'Rehydration'.)

Intravenous replacement fluid therapy is discussed in detail separately. (See "Maintenance and replacement fluid therapy in adults", section on 'Replacement fluid therapy'.)

Diet — In adults with acute viral gastroenteritis, we do not recommend adherence to any restricted diet. Patients should be encouraged to eat as tolerated. Smaller meals may be less likely to induce vomiting than larger ones. Bland, low-residue foods may also be better tolerated than others. For healthy adults with acute viral gastroenteritis without signs of dehydration, sport drinks, diluted fruit juices, and other flavored soft drinks augmented with saltine crackers and broths or soups can meet the fluid and salt needs in almost all cases. Broiled starches/cereals (potatoes, noodles, rice, wheat, and oat) with some salt are excellent foods to consider. In addition, crackers, bananas, yogurt, soups, and boiled vegetables can also be consumed.

While the BRAT diet (**b**ananas, **r**ice, **a**pplesauce, and **t**oast) is often recommended, the evidence to support it is weak [27]. Similarly, while many authorities advise patients to exclude milk and dairy products from their diet during the episode of diarrhea and for several weeks after symptoms resolve, the evidence to support this is weak [28]. A 2008 systematic review of 71 studies concluded that there is limited evidence in adults to support dietary restrictions and that restricted and unrestricted diets seem to be equally effective at reducing the duration of watery and non-watery diarrhea [29].

Probiotics — The value of oral probiotics in acute viral gastroenteritis is not well established, and further research is needed to determine the optimal type, dose, and regimen of probiotics before they are recommended for routine use.

Probiotics may modulate the immune response through interaction with the gut-associated immune system or through direct effect on other microorganisms [30]. Multiple systematic reviews have demonstrated a modest reduction in the duration of infectious diarrhea with the use of probiotics, although there was heterogeneity among studies [31-38]. (See "Probiotics for gastrointestinal diseases", section on 'Infectious diarrhea'.)

Zinc — The effect of zinc supplementation on duration of diarrheal illnesses in adults has not been studied, and its use is not the standard of care. The WHO and United Nations Children's Fund (UNICEF) recommend zinc for children with acute diarrhea [39,40], since diarrhea may cause zinc deficiency resulting in longer duration and severity of symptoms [41]. In developing countries where mild to moderate zinc deficiency is highly prevalent, this may affect recovery from acute gastroenteritis [39].

Pharmacotherapy — In general, viral gastroenteritis is an acute and self-limited disease that does not require pharmacologic therapy. It is important to remember that adequate fluid repletion is the mainstay of treatment of acute viral gastroenteritis and that any pharmacologic agents are to be used as adjuncts.

When indicated for viral gastroenteritis, an antimotility agent may be added to decrease fluid losses; however, these agents may mask the amount of fluid lost, since fluid may pool in the intestine. When indicated, an antiemetic may be used to allow adequate oral rehydration.

Antimotility agents — Specific symptomatic therapies for adults with acute viral gastroenteritis with moderate to severe non-bloody diarrhea or signs or symptoms of volume depletion (table 2) who do not have a fever higher than low-grade are discussed in detail separately. (See "Approach to the adult with acute diarrhea in resource-abundant settings", section on 'Symptomatic therapy'.)

In some types of non-viral diarrheal illness the use of antimotility agents could be harmful. (See 'Differential diagnosis' above.)

Antiemetics — Although studies in adult populations are lacking, for patients who cannot tolerate oral rehydration due to excessive vomiting, we suggest treating with an antiemetic (eg, prochlorperazine or ondansetron) as needed for one to two days to facilitate oral fluid repletion.

A systematic review of 10 randomized trials compared various antiemetics (dexamethasone, dimenhydrinate, granisetron, metoclopramide, and ondansetron) prescribed for children who presented with vomiting and a confirmed clinical diagnosis of acute gastroenteritis [42]. Ondansetron increased the proportion of children with cessation of vomiting, reduced the immediate hospital admission rate and the need for intravenous rehydration therapy. Ondansetron also has a very good safety profile and does not cause any sedation [43]. An increased risk of diarrhea has been reported after the administration of ondansetron in acute gastroenteritis, but it is usually self-limited and lasts less than 48 hours.

Antibiotics — In adults who clearly have acute viral gastroenteritis (eg, outbreak with known etiology), we do not recommend the empiric use of antibiotics. In general, empiric therapy for community-acquired acute diarrhea (of unclear etiology) may be beneficial but does not appear to dramatically alter the course of illness in unselected populations. If patients initially treated with supportive measures do not improve after seven days or symptoms worsen, then they should be reevaluated and possibly treated for other causes of gastroenteritis. (See 'Differential diagnosis' above and "Approach to the adult with acute diarrhea in resource-abundant settings", section on 'Empiric antibiotic therapy'.)

When to hospitalize — Most individuals with acute viral gastroenteritis can be managed in the outpatient setting. Potential indications for hospitalization include the presence of alarm symptoms or signs (table 1), or individuals at risk for complications (eg, dehydration), including [20,44]:

- Volume depletion/dehydration
- Intractable vomiting
- Abnormal electrolytes or renal function
- Excessive bloody stool or rectal bleeding
- Severe abdominal pain
- Prolonged symptoms (more than one week)
- Age 65 or older with signs of hypovolemia
- Comorbidities (eg, diabetes mellitus, immunocompromised)
- Pregnancy

PROGNOSIS/COMPLICATIONS

Acute viral gastroenteritis is usually transient and self-limited with an excellent prognosis. In developed countries, hospital admission for acute gastroenteritis is uncommon but necessary when severe dehydration is present. Older frail adults are also more susceptible to dehydration and subsequent complications (eg, syncope, hypotension) [14]. Persons with medical comorbidities, such as immunodeficiency, inflammatory bowel disease, valvular heart disease, diabetes mellitus, renal impairment, rheumatoid arthritis, and systemic lupus erythematosus, as well as patients taking immunosuppressants, systemic corticosteroids, or diuretics, are more vulnerable and at risk for complications and poor outcomes [45]. These patients require closer follow-up and a lower threshold for hospitalization or further evaluation if the gastroenteritis is not resolving.

PREVENTION

Prevention occurs at both the individual and community level. The best preventive measure that individuals can take is adequate hand hygiene and avoidance of close contact, if possible, with people with symptoms of gastroenteritis. Individuals with acute gastroenteritis should be counseled about diligent hand hygiene to help prevent spread of infection to their family, colleagues, and contacts. (See "Infection control in the outpatient setting".)

Appropriate community infection control measures partially depend on the epidemiologic setting in which viral gastroenteritis is taking place. For disease outbreaks occurring in health care and long-term care facilities (typically caused by norovirus [46-48]), standard enteric precaution measures involve careful handwashing and use of barriers, such as wearing gloves. A meta-analysis, not limited to viral gastroenteritis, suggested that handwashing with soap reduces diarrheal risk by 47 percent [49]. Cohorting of patients may become necessary in outbreaks that are slow to control. Similar measures should be employed in acute care hospitals for adults [47]. (See "Norovirus", section on 'Outbreaks'.)

In outbreaks from contamination of an identified water or food source, public health measures should be directed at identified sources [46,50-52]. Most foodborne cases of gastroenteritis in the United States are due to norovirus [51]; contamination of food occurs either at the environmental source (eg, oysters or raspberries) or by food handlers [53]. Recurring norovirus outbreaks on cruise ships have presented difficult problems in infection control requiring isolation of ill crew members (and passengers, if possible) and disinfection of ships with chlorine solutions, phenol-based compounds, or accelerated hydrogen peroxide products [54].

Norovirus is a very stable agent that easily persists in the environment and is notoriously difficult to eradicate; it persists after treatment with chlorine solutions that are well beyond concentrations present in public water systems [55]. Norovirus is the most infectious of viral pathogens, with a median infectious dose of only 18 viruses, which further compounds problems for eradication [56].

INFORMATION FOR PATIENTS

UpToDate offers two types of patient education materials, "The Basics" and "Beyond the Basics." The Basics patient education pieces are written in plain language, at the 5th to 6th grade reading level, and they answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials. Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are written at the 10th to 12th grade reading level and are best for patients who want in-depth information and are comfortable with some medical jargon.

Here are the patient education articles that are relevant to this topic. We encourage you to print or e-mail these topics to your patients. (You can also locate patient education articles on a variety of subjects by searching on "patient info" and the keyword(s) of interest.)

- Basics topic (see "Patient education: Viral gastroenteritis in adults (The Basics)")

SUMMARY AND RECOMMENDATIONS

- **Etiology** – Acute viral gastroenteritis, characterized by diarrhea and vomiting, peaks in the winter and spring months. The most common pathogens are norovirus and rotavirus. (See 'Etiology' above.)

- **Clinical manifestations** – Acute viral gastroenteritis typically has a short incubation period (24 to 60 hours), a short infection duration (12 to 60 hours), and a high frequency of vomiting, as well as diarrhea. Patients may present with signs of dehydration if they are unable to drink enough fluids to compensate for fluid losses. (See 'Clinical manifestations' above.)

- **Diagnosis**

- The diagnosis of acute viral gastroenteritis is made by a characteristic history of diarrheal disease of rapid onset that lasts less than one week and may be accompanied by nausea, vomiting, fever, or abdominal pain. Laboratory and stool studies are not required for the diagnosis of acute viral gastroenteritis. (See 'Diagnosis' above.)

- However, adults presenting with persistent fever, dehydration, blood or pus in the stool, or alarm symptoms and signs (table 1) need to be evaluated for a nonviral cause of gastroenteritis (algorithm 1). The diagnostic approach to patients in these settings is discussed in detail separately. (See "Approach to the adult with acute diarrhea in resource-abundant settings", section on 'Evaluation' and "Approach to the adult with acute diarrhea in resource-limited settings", section on 'Clinical assessment'.)

- **Supportive treatment** – Acute viral gastroenteritis is usually self-limited and is treated with supportive measures (fluid repletion and unrestricted nutrition). No specific antiviral agents are available. (See 'Treatment' above.)

  - For adults presenting with acute viral gastroenteritis without signs of volume depletion, adequate volume can be maintained with sports drinks and broths. Soft drinks and fruit juices that are high in sugar content should be avoided. For adults presenting with signs of mild to moderate hypovolemia (table 2), oral rehydration salts (ORS) solution may be superior to sports drinks in maintaining electrolyte balance along with hydration. For adults with severe hypovolemia, repletion with intravenous fluids is required (algorithm 2). (See 'Fluid maintenance and repletion' above.)

- **Adjunctive pharmacotherapy for some patients** – Although not required for management of most cases of acute viral gastroenteritis, in some situations, adjunctive pharmacologic treatment can be used for excessive vomiting or excessive fluid loss from diarrhea. Empiric antibiotic therapy is **not** indicated in patients with viral gastroenteritis.

  - The use of anti-motility agents in patients with viral gastroenteritis is discussed separately. (See "Approach to the adult with acute diarrhea in resource-abundant settings", section on 'Symptomatic therapy'.)

  - For adults with acute viral gastroenteritis who cannot tolerate oral rehydration due to excessive vomiting, we suggest treating with an antiemetic (eg, prochlorperazine or ondansetron) to facilitate oral rehydration (**Grade 2C**). (See 'Antiemetics' above.)

- **Indications for hospitalization** – Acute viral gastroenteritis is usually transient and self-limited with an excellent prognosis. Most individuals with acute viral gastroenteritis can be managed in the outpatient setting. Indications for hospitalization include the presence of

alarm symptoms or signs (table 1), or adults at risk for complications (older age, frailty, immunosuppressed). (See 'When to hospitalize' above and 'Prognosis/complications' above.)

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Topic 16294 Version 28.0

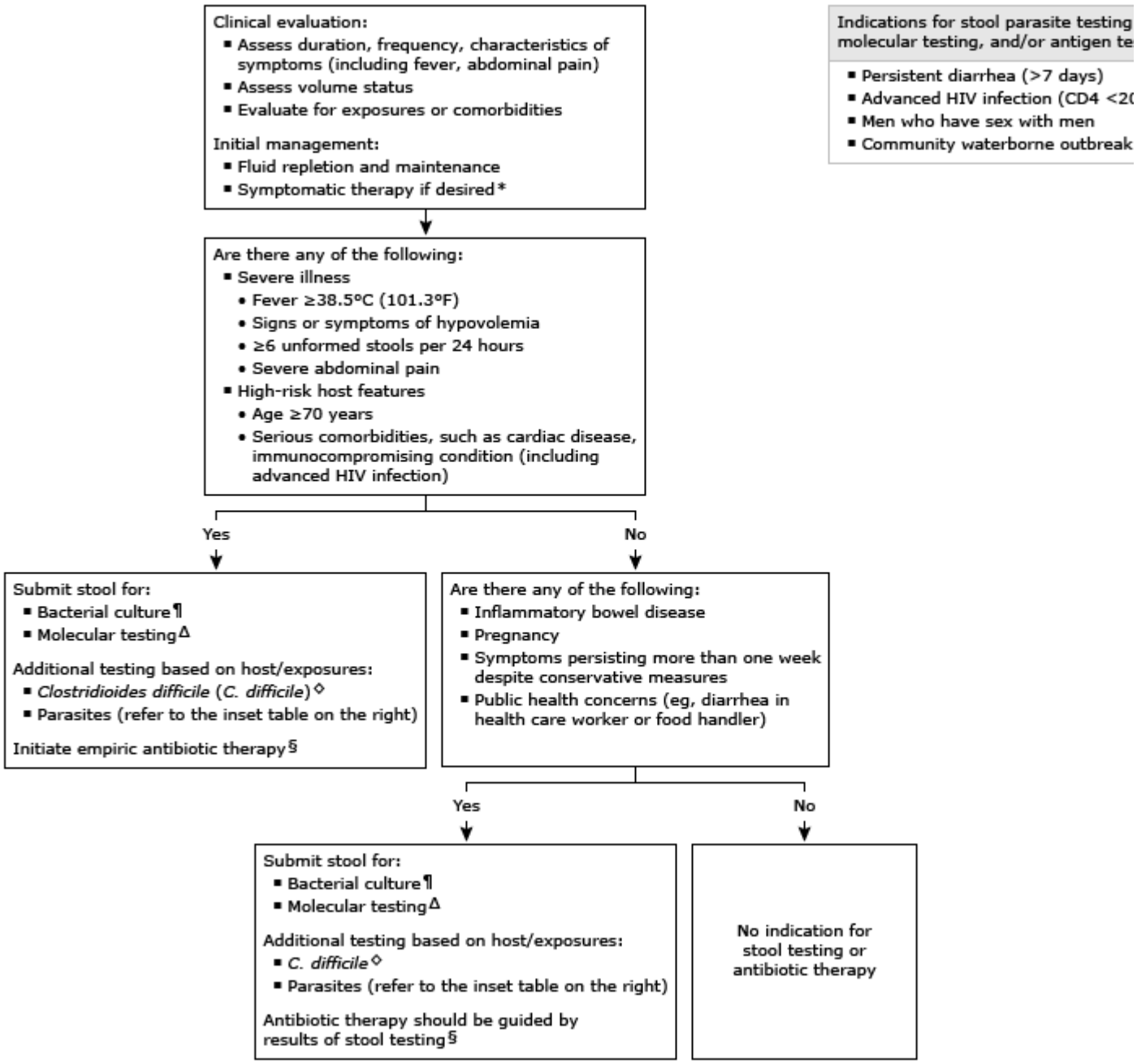
GRAPHICS

Gastroenteritis alarm symptoms and signs

Volume depletion/dehydration: ▪ Dry mucous membranes (dry mouth) ▪ Decreased skin turgor ▪ Increased thirst ▪ Altered mental status (confusion, lethargy) ▪ Dizziness, lightheadedness ▪ Headache ▪ Tachycardia, palpitations ▪ Hypotension, orthostasis ▪ Presyncope or syncope ▪ Weakness, fatigue ▪ Decreased urine output, concentrated urine (deep yellow or amber color)
Bloody stool/rectal bleeding
Weight loss
Severe abdominal pain
Prolonged symptoms (more than a week)
Recent hospitalization or antibiotics
Age ≥65 years
Comorbidities such as HIV and diabetes (immunocompromised status)
Pregnancy

Graphic 89438 Version 1.0

Approach to acute nonbloody diarrhea in adults in resource-rich settings



This algorithm outlines an approach to the workup and initial management of acute diarrhea acquired in resource-rich settings, with a focus on infectious etiologies, which are the most common causes. Refer to UpToDate content on acute diarrhea in resource-rich settings for more details.

HIV: human immunodeficiency virus.

* Loperamide and bismuth salicylates are both effective in reducing the duration and frequency of diarrhea; loperamide is somewhat more effective. Loperamide is often avoided when *C. difficile* is suspected. Patients taking loperamide should be cautioned not to exceed the maximum daily dose.

¶ Routine stool culture identifies *Salmonella*, *Campylobacter*, and *Shigella*. If other bacterial organisms (such as *Vibrio*, *Listeria*, *Yersinia*, or *Aeromonas*) are suspected based on exposures, the laboratory should

be notified for specific plating of the specimen.

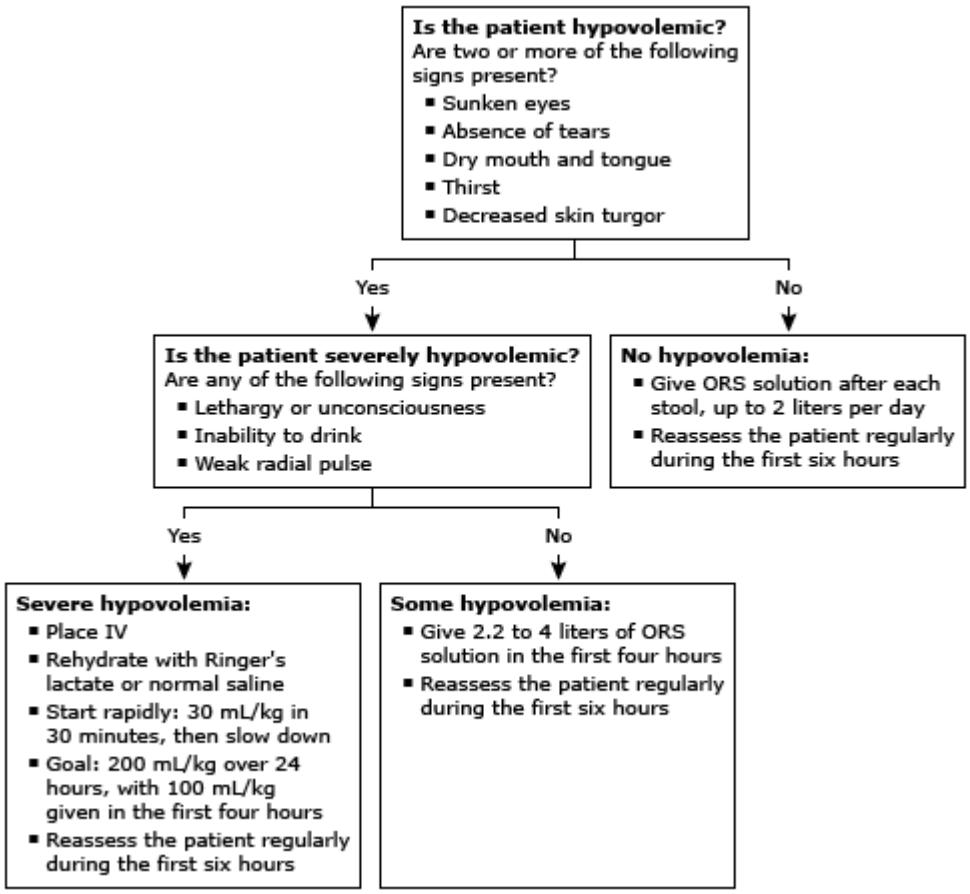
Δ Some laboratories perform multiplex molecular stool testing for multiple organisms simultaneously; the indications for such testing are similar to those for stool cultures. Any specimens that test positive for a bacterial pathogen on a multiplex molecular panel (or other culture-independent test) should be submitted for confirmatory culture; this is important for susceptibility testing and for public health purposes.

◇ Testing for *C. difficile* is warranted for individuals who have had antibiotic use or hospitalization within the prior three months; in addition, testing for *C. difficile* is often performed in patients with inflammatory bowel disease.

§ For most patients with non-travel-associated diarrhea, we do not administer empiric antibiotic therapy routinely, since the potential benefits do not outweigh potential drawbacks in most patients with acute diarrhea. For select patients with severe or persistent disease or high-risk host features, empiric antibiotic treatment is reasonable since symptom reduction may have a greater relative benefit in such patients. In such cases, we suggest treatment with azithromycin or a fluoroquinolone. We favor azithromycin for patients with fever and in patients suspected to be at risk for a fluoroquinolone-resistant pathogen (eg, in patients with diarrhea after travel to Southeast Asia, or during outbreaks of resistant pathogens). Empiric antibiotic therapy should be tailored to stool culture results when available.

Graphic 68348 Version 13.0

Approach to fluid management in adult with hypovolemia



ORS: oral rehydration salts.

Courtesy of Regina C LaRocque, MD, MPH, and Mark Pietroni, MA, MBBChir, FRCP, DTM&H.

Graphic 86529 Version 3.0

Signs and symptoms of volume depletion/dehydration

Dry mucous membranes (dry mouth)
Decreased skin turgor
Increased thirst
Altered mental status (confusion, lethargy)
Dizziness, lightheadedness
Headache
Tachycardia, palpitations
Hypotension, orthostasis
Presyncope or syncope
Weakness, fatigue
Decreased urine output, concentrated urine (deep yellow or amber color)

Graphic 89437 Version 2.0

Contributor Disclosures

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Conflict of interest policy