GI Infections Part 1

James A. Platts-Mills, MD
University of Virginia

8/2/2026

Disclosures of Financial Relationships with Relevant Commercial Interests

- None

Question #1

- The morning after families had arrived at a camp for a week-long retreat, approximately one-third of participants had developed nausea (65%), vomiting (44%), abdominal cramps (85%) and diarrhea (94%) during the night.
- The night prior, they shared a meal which consisted of a casserole containing macaroni, frozen mixed vegetables, ground beef, turkey, and gravy.
- The mean onset of symptoms was 11 hours after the meal. All affected persons were substantially improved within 24 hours after onset and there were no secondary cases.

Which one of the following is most likely responsible for this outbreak?

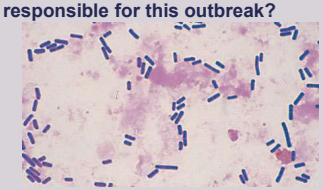
A. *Staph aureus*
B. *Clostridium perfringens*
C. Enterotoxigenic *E. coli*
D. *Listeria monocytogenes*
E. Norovirus

Question #1

- The morning after families had arrived at a camp for a week-long retreat, approximately one-third of participants had developed nausea (65%), vomiting (44%), abdominal cramps (85%) and diarrhea (94%) during the night.
- The night prior, they shared a meal which consisted of a casserole containing macaroni, frozen mixed vegetables, ground beef, turkey, and gravy.
- The mean onset of symptoms was 11 hours after the meal. All affected persons were substantially improved within 24 hours after onset and there were no secondary cases.

Which one of the following is most likely responsible for this outbreak?

A. *Staph aureus*
B. *Clostridium perfringens**
C. Enterotoxigenic *E. coli*
D. *Listeria monocytogenes*
E. Norovirus



Major Gastrointestinal Illness Syndromes

Food poisoning: starts < 24 hours from exposure, short duration, causes are *Staph aureus* toxin, *B. cereus* toxin, *Clostridium perfringens*

Watery diarrhea/vomiting: > 24 hours after exposure, lasts for a few days to a week: viral etiology most likely but differential remains broad esp. *diarrheagenic E. coli, Salmonella, Campylobacter*

Colitis/Dysentery: decreased volume, increased frequency, abdominal pain and cramping, tenesmus, bloody stools: *Campylobacter/Shigella* (Fever + blood), *Yersinia/Salmonella* (Fever), Shiga toxin-producing *E. coli* (Blood), *E. histolytica* (Blood + fever with liver abscess only)

Persistent diarrhea (>14 days duration): *Cryptosporidium, Giardia*, broader differential in immunocompromised patients (including norovirus)

Diarrhea + severe systemic manifestations (high fever, rigors, severe abdominal pain, headache, sepsis): consider invasive *Salmonella, Listeria, Campylobacter*

Question #2

- An outbreak of illness was reported among approximately 50 persons eating at an area restaurant.
- The illness consisted of nausea (97%), vomiting (97%), abdominal cramps (86%), chills (78%), muscle aches (67%), fever (64%), headache (61%) and watery diarrhea (58%).
- The median incubation period was 31.3 hours; one person was hospitalized and 10 sought medical care. The illness lasted approximately 48-72 hours.

What is the most likely cause of the outbreak?

A. Norovirus
B. Shiga toxin-producing E. coli 0157:H7 (STEC)
C. Campylobacter
D. Enterotoxigenic E. coli (ETEC)
E. Pre-formed Staphylococcus aureus enterotoxin

Question #2

- An outbreak of illness was reported among approximately 50 persons eating at an area restaurant.
- The illness consisted of nausea (97%), vomiting (97%), abdominal cramps (86%), chills (78%), muscle aches (67%), fever (64%), headache (61%) and watery diarrhea (58%).
- The median incubation period was 31.3 hours; one person was hospitalized and 10 sought medical care. The illness lasted approximately 48-72 hours.

What is the most likely cause of the outbreak?

A. Norovirus*
B. Shiga toxin-producing E. coli 0157:H7 (STEC)
C. Campylobacter
D. Enterotoxigenic E. coli (ETEC)
E. Pre-formed Staphylococcus aureus enterotoxin

Major Gastrointestinal Illness Syndromes

Food poisoning: starts < 24 hours from exposure, short duration, causes are *Staph aureus* toxin, *B. cereus* toxin, *Clostridium perfringens*

Watery diarrhea/vomiting: > 24 hours after exposure, lasts for a few days to a week: viral etiology most likely but differential remains broad esp. *diarrheagenic E. coli, Salmonella, Campylobacter*

Colitis/Dysentery: decreased volume, increased frequency, abdominal pain and cramping, tenesmus, bloody stools: *Campylobacter/Shigella* (Fever + blood), *Yersinia/Salmonella* (Fever), Shiga toxin-producing *E. coli* (Blood), *E. histolytica* (Blood + fever with liver abscess only)

Persistent diarrhea (>14 days duration): *Cryptosporidium, Giardia*, broader differential in immunocompromised patients (including norovirus)

Diarrhea + severe systemic manifestations (high fever, rigors, severe abdominal pain, headache, sepsis): consider invasive *Salmonella, Listeria, Campylobacter*

Question #3

- A previously healthy 30-year-old male went to India for a one-week work trip and developed diarrhea and fever on the fifth day of travel.
- After 36 hours of watery diarrhea, they experience increasing abdominal pain and frequent small-volume bowel movements containing blood and mucous.

Which of the following would be the most appropriate empiric therapy for this patient?

A. Ciprofloxacin
B. Azithromycin
C. Nitazoxanide
D. No antibiotic therapy recommended
E. Rifaximin

Question #3

- A previously healthy 30-year-old male went to India for a one-week work trip and developed diarrhea and fever on the fifth day of travel.
- After 36 hours of watery diarrhea, they experience increasing abdominal pain and frequent small-volume bowel movements containing blood and mucous.

Which of the following would be the most appropriate empiric therapy for this patient?

A. Ciprofloxacin
B. Azithromycin*
C. Nitazoxanide
D. No antibiotic therapy recommended
E. Rifaximin

Question #4

- A 45-year-old male with no past medical history develops watery diarrhea 4 days into a two-week trip to South Asia.
- He has had to limit his activities but is able to eat and drink and has access to a bathroom in his hotel room.

Which of the following would be the most appropriate empiric therapy for this patient?

A. Ciprofloxacin
B. Azithromycin
C. Nitazoxanide
D. No antibiotic therapy recommended
E. Rifaximin

Question #4

- A 45-year-old male with no past medical history develops watery diarrhea 4 days into a two-week trip to South Asia.
- He has had to limit his activities but is able to eat and drink and has access to a bathroom in his hotel room.

Which of the following would be the most appropriate empiric therapy for this patient?

A. Ciprofloxacin
B. Azithromycin
C. Nitazoxanide
D. No antibiotic therapy recommended*
E. Rifaximin

Empiric Therapy for Traveler's Diarrhea (IDSA Guidelines)

- ***Recommendation:*** Do **not** treat most cases of traveler's diarrhea – reserve treatment for **severe diarrhea** (incapacitating/completely prevents planned activities and/or dysentery) or for **high-risk patients**
- ***Rationale:*** Benefit (reduction in duration of diarrhea several days to one or two days) is no worth the drawbacks (cost, potential side effects, and promotion of bacterial resistance)
- If treating, favor **azithromycin** or **rifaximin** (but not if features of invasive disease) >> ciprofloxacin due to resistance and adverse effect profile

Question #5

- A 38-year-old male presents to a clinic in Ohio in mid-July with a 3-week history of watery diarrhea, severe fatigue, abdominal cramping, and an 8-pound weight loss.
- He describes a week of explosive watery diarrhea followed by intermittent symptoms over the subsequent two weeks. He denies recent international travel.
- He reports eating at a national fast-food chain during a recent road trip through the Midwest.
- A routine stool ova and parasite (O&P) examination ordered by his primary provider last week was negative, but a multiplex gastrointestinal PCR panel is positive for *Cyclospora cayetanensis*.

Which is the best choice of therapy for this patient?

A. Metronidazole
B. Nitazoxanide
C. Trimethoprim-sulfamethoxazole
D. No antibiotic therapy recommended
E. Ciprofloxacin

Question #5

- A 38-year-old male presents to a clinic in Ohio in mid-July with a 3-week history of watery diarrhea, severe fatigue, abdominal cramping, and an 8-pound weight loss.
- He describes a week of explosive watery diarrhea followed by intermittent symptoms over the subsequent two weeks. He denies recent international travel.
- He reports eating at a national fast-food chain during a recent road trip through the Midwest.
- A routine stool ova and parasite (O&P) examination ordered by his primary provider last week was negative, but a multiplex gastrointestinal PCR panel is positive for *Cyclospora cayetanensis*.

Which is the best choice of therapy for this patient?

A. Metronidazole
B. Nitazoxanide
C. Trimethoprim-sulfamethoxazole*
D. No antibiotic therapy recommended
E. Ciprofloxacin

High-yield Points on Antibiotic Therapy for Diarrhea

- **No antibiotic therapy**: Mild-moderate disease in immunocompetent patients with *Salmonella, Campylobacter*, diarrheagenic *E. coli* and all shiga-toxin producing *E. coli* infections
- **Azithromycin and ciprofloxacin**: Treatments of choice for mild-moderate *Shigella, Campylobacter* (dysentery), *Salmonella* (>50, valve disease, severe atherosclerosis)
- **In hospitalized patients/severe disease**, targeted therapy is typically ceftriaxone (*Shigella, Salmonella, Yersinia*) or meropenem (*Campylobacter*)
- **Trimethoprim-Sulfamethoxazole**: Treatment of choice for mild-moderate *Yersinia enterocolitica, Aeromonas, Plesiomonas, Cyclospora*
- **Doxycycline**: Treatment of choice for *Vibrio*
- **Ampicillin**: Treatment of choice for *Listeria*

Question #6

- A 35-year-old female presents for a post-travel evaluation six weeks after return from a trip to Costa Rica. During travel, she had fever and diarrhea and self-administered azithromycin 500mg PO x 3 days.
- Since returning, she has had intermittent abdominal pain, bloating, and loose stools.
- A multiplex PCR panel including common bacteria, viruses, and intestinal protozoa is negative.

Which of the following would be the most appropriate next step in management for this patient?

A. Serologic testing for Celiac disease
B. Referral for endoscopy
C. Initiate treatment with nitazoxanide
D. Reassurance and expectant management
E. Modified acid-fast stain of a stool sample

Question #6

- A 35-year-old female presents for a post-travel evaluation six weeks after return from a trip to Costa Rica. During travel, she had fever and diarrhea and self-administered azithromycin 500mg PO x 3 days.
- Since returning, she has had intermittent abdominal pain, bloating, and loose stools.
- A multiplex PCR panel including common bacteria, viruses, and intestinal protozoa is negative.

Which of the following would be the most appropriate next step in management for this patient?

A. Serologic testing for Celiac disease
B. Referral for endoscopy
C. Initiate treatment with nitazoxanide
D. Reassurance and expectant management*
E. Modified acid-fast stain of a stool sample

Post-infectious Irritable Bowel Syndrome

- ~10-30% of patients will develop IBS after acute gastroenteritis, which can be persistent, in particular after bacterial diarrhea (*Campylobacter, Shigella, Salmonella*).
- Can persist for months to years but generally follows a progressively improving course.
- Treatment options include rifaximin, low FODMAP diet, loperamide, anti-depressants – questions related to IBS management probably out of bounds for ID boards!

Role of Diagnostics (IDSA Guidelines)

Recommendation: Consider diagnostic testing (NAAT panels preferred) for

- Diarrhea accompanied by 1) **fever**; 2) **bloody or mucoid stools**; 3) **severe abdominal pain/cramping/tenderness**; 4) **sepsis**; 5) **immunocompromised patients** (include testing for *Cryptosporidium, Cyclospora/Isospora*, microsporidia, MAC, CMV)
- Diarrhea + concern for an **outbreak** or if in a population with public health implications (e.g., **food workers, healthcare workers**)

A Typical GI Pathogen Panel
(Additional Stool-based Diagnostic Needed)

BACTERIA:
- *Campylobacter (jejuni, coli, and upsaliensis)*
- *Clostridium difficile* (toxin A/B)
- *Plesiomonas shigelloides*
- *Salmonella*
- *Yersinia enterocolitica*
- *Vibrio (parahaemolyticus, vulnificus, and cholerae)*
- *Vibrio cholera*

DIARRHEAGENIC E. COLI/SHIGELLA:
- *Enteroaggregati E. coli* (EAEC)
- *Enteropathogenic E. coli* (EPEC)
- *Enterotoxigenic E. coli* (ETEC) *lt/st*
- *Shiga-like toxin-producing E. coli* (STEC) *stx1/stx2*
- *E. coli* O157
- *Shigella/Enteroinvasive E. coli* (EIEC)

PARASITES:
- *Cryptosporidium*
- *Cyclospora cayetanensis*
- *Entamoeba histolytica*
- *Giardia lamblia*
- Microsporidia (*E. bieneusi, E. intestinalis, etc.)*
- *Cystoisospora belli*

VIRUSES:
- Adenovirus F40/41
- Astrovirus
- Norovirus GI/GII
- Rotavirus A
- Sapovirus (I, II, IV, and V)

SEE ENLARGED SLIDE FOLLOWING ENTIRE PRESENTATION

Question #7

- A 24-year-old male presents to the emergency room with several days of watery diarrhea, nausea, and vomiting. He returned three days prior from a weeklong trip to India.
- Vital signs are T 37.5C, BP 80/52, HR 118, O2 98%.
- Physical examination is notable for dry mucous membranes.
- Labs are notable for HCT 50, Na 144, K 3.0, HCO3 12, BUN 41, Cr 1.2

What is the most likely cause of his illness?

A. Campylobacter jejuni
B. Rotavirus
C. Vibrio cholerae
D. Shigella sonnei
E. Adenovirus Type F

Question #7

- A 24-year-old male presents to the emergency room with several days of watery diarrhea, nausea, and vomiting. He returned three days prior from a weeklong trip to India.
- Vital signs are T 37.5C, BP 80/52, HR 118, O2 98%.
- Physical examination is notable for dry mucous membranes.
- Labs are notable for HCT 50, Na 144, K 3.0, HCO3 12, BUN 41, Cr 1.2

What is the most likely cause of his illness?

A. Campylobacter jejuni
B. Rotavirus
*C. Vibrio cholerae**
D. Shigella sonnei
E. Adenovirus Type F

Question #8

- A 42-year-old male presents to the emergency room with fever, abdominal pain, and constipation. He returned from a business trip to India two weeks prior and was in his usual state of health until the onset of fever and fatigue 4 days prior to presentation.
- His fevers worsened and were accompanied by abdominal pain, poor appetite, and constipation.
- Blood cultures revealed a Gram-negative rod.

What is the most likely cause of his illness?

A. Campylobacter jejuni
B. Plasmodium falciparum
C. Salmonella Typhi
D. Shigella flexneri
E. Enteroinvasive *E. coli*

Question #8

- A 42-year-old male presents to the emergency room with fever, abdominal pain, and constipation. He returned from a business trip to India two weeks prior and was in his usual state of health until the onset of fever and fatigue 4 days prior to presentation.
- His fevers worsened and were accompanied by abdominal pain, poor appetite, and constipation.
- Blood cultures revealed a Gram-negative rod.

What is the most likely cause of his illness?

A. *Campylobacter jejuni*
B. Plasmodium falciparum
C. Salmonella Typhi*
D. *Shigella flexneri*
E. Enteroinvasive *E. coli*

To be continued…

Key Clues And Distinguishing Clinical Features For Less Common Causes Of GI Illness In Travelers

Cholera

Exposures: travel to South/Southeast Asia > East Africa

Clinical manifestations: Rice water stools, severe dehydration

Lab findings: Hemoconcentration, azotemia, acidosis, hypokalemia

Enteric fever (*Salmonella Typhi >> Paratyphi)*

Risk factors: Absence of pre-travel vaccination (or oral typhoid vaccine not taken appropriately) + travel to South/Southeast Asia > Africa > Americas (Paratyphi)

Clinical manifestations: Fever, abdominal pain, and constipation>>diarrhea

Lab findings: Elevated liver enzymes, blood culture with GNR