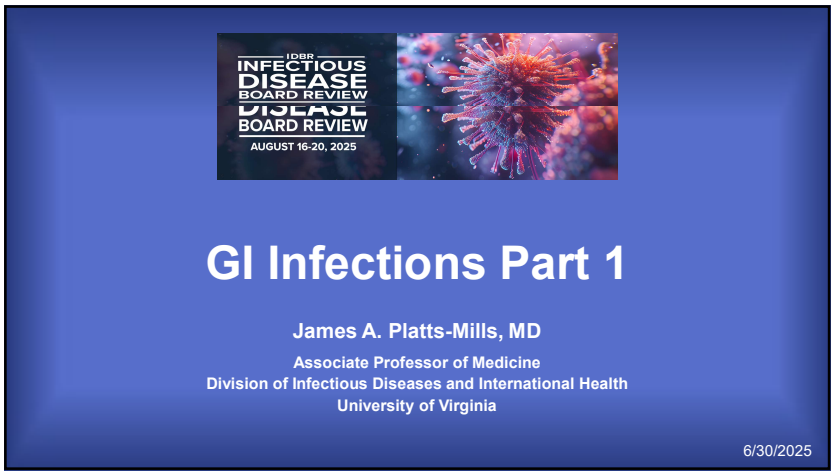
17 GI Infections Part 1

Speaker: James Platts-Mills, MD



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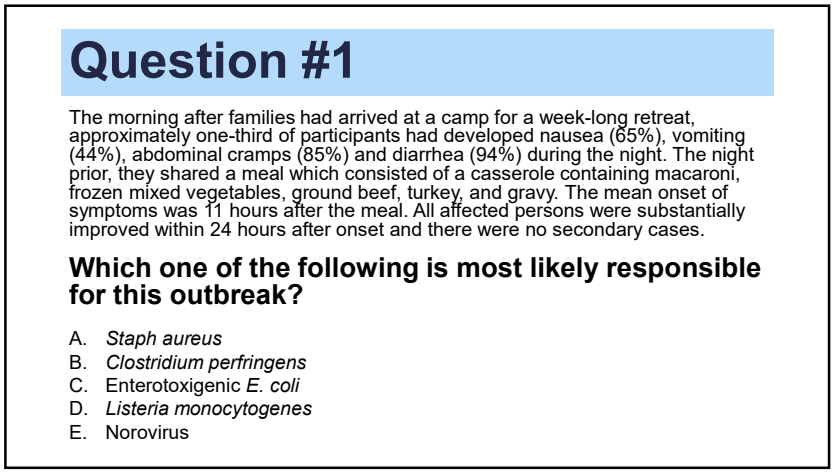

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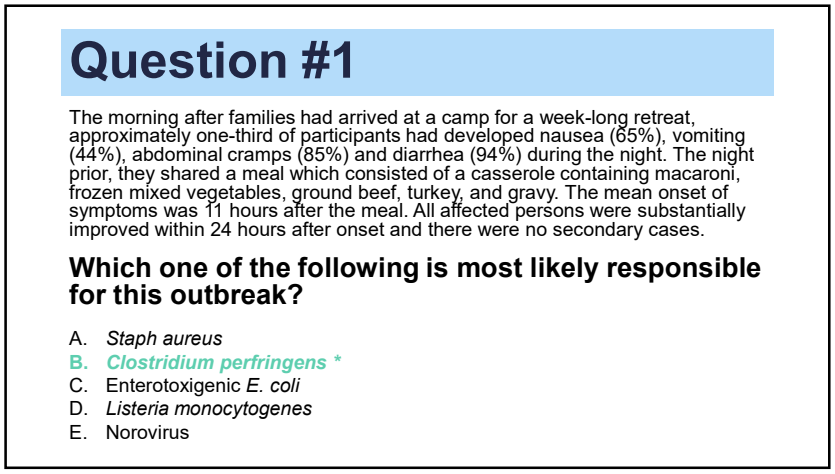

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Major Gastrointestinal Illness Syndromes

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

- Symptoms (mostly vomiting) within six hours suggest ingestion of a preformed toxin of *Staphylococcus aureus* or *Bacillus cereus* (emetic syndrome)
- Symptoms that begin from 6 to 24 hours suggest *Clostridium perfringens* or *Bacillus cereus* (diarrheal syndrome)

Watery diarrhea/vomiting: > 24 hours after exposure, lasts for a few days to a week: viral etiology (rotavirus, norovirus, sapovirus, adenovirus, astrovirus) but differential remains broad esp. *Salmonella*, *Campylobacter, diarrheagenic E. coli*

Dysentery: progression from watery diarrhea, but volume decreases, frequency increases, abdominal pain and cramping, tenesmus: *Campylobacter*/*Shigella* (Fever common), Shiga toxin-producing *E. coli* (Fever *uncommon*), *E. histolytica* (fever uncommon for luminal disease)

Persistent diarrhea (>14 days): *Cryptosporidium, Giardia,* broader differential in immunocompromised patients (including norovirus), but often non-infectious or post-infectious IBS)

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

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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

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Question #3

A nursing home experiences an outbreak of diarrhea with fever among long-term residents. Over the course of several weeks, additional residents develop illness one to three days after contact with illness cases.

Which one of the following organisms is the most likely cause?

A. *Salmonella enterica* (non Typhi)
B. *Vibrio cholerae*
C. *Shigella sonnei*
D. Enterotoxigenic *E. coli* (ETEC)
E. Toxin-producing strain of *Staph aureus*

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Infectious Doses for Common Enteric Pathogens

10^{5-8}	10^{1-3}
Diarrheagenic *E. coli*	*Shigella*
V. cholerae	*Giardia lamblia*
Campylobacter	*E. histolytica*
	Cryptosporidium
	Viruses
Only from food, water, other non-human sources	... also can be spread person to person

(*Salmonella* is complicated, but in general S. Typhi and S. Paratyphi can be person to person, whereas non-typhoidal *Salmonella* usually are not)

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Question #4

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

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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 > ciprofloxacin: Treatments of choice for mild-moderate *Shigella*, *Campylobacter* (dysentery), *Salmonella* (>50, valve disease, severe atherosclerosis)

Trimethoprim-Sulfamethoxazole: Treatment of choice for mild-moderate *Yersinia enterocolitica*

In **hospitalized patients/severe disease**, empiric therapy is typically **ceftriaxone** (*Shigella*, *Salmonella*, *Yersinia*) or **meropenem** (*Campylobacter*)

Doxycycline: Treatment of choice for *Vibrio*

Ampicillin: Treatment of choice for *Listeria*

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Question #5

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?

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C. Nitazoxanide
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2017 IDSA Guidelines: Empiric Therapy for Traveler's Diarrhea

Recommendation: Do **not** treat most cases of traveler's diarrhea – reserve treatment for **severe diarrhea** (incapacitating/completely prevents planned activities and/or dysentery)

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>ciprofloxacin 2/2 resistance, adverse effect profile

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Question #6

PREVIEW QUESTION

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

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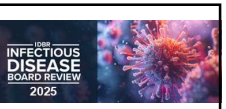

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Post-infectious Irritable Bowel Syndrome

~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!

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2017 IDSA Guidelines: Role of Diagnostics

Recommendation: Consider diagnostic testing (NAAT panels preferred) for

A. 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)

B. Diarrhea + concern for an **outbreak** or if in a population with public health implications (e.g., **food workers**, **healthcare workers**)

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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)

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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

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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*

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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

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To be continued…

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