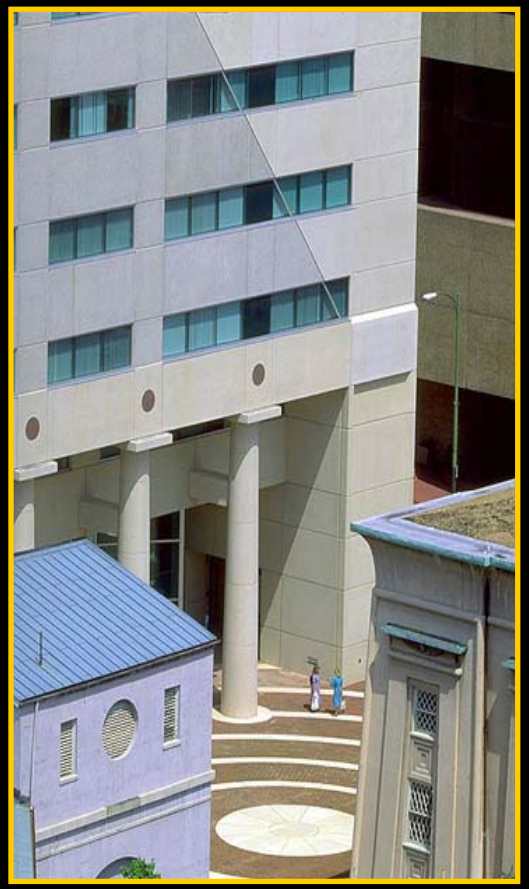
Enteric Infections
VCU SOM
M2 Medical Microbiology



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Case

- 20 year old homosexual man presents with a 3 day history of bloody diarrhea, tenesmus, crampy lower abdominal pain, chills and fever to 39.5C
- He admits to having multiple sexual partners but has never been tested for HIV

Cunha, Burke . ***Infectious Diseases Pearls. Hanley & Belfus Inc, 1999***

Definition

- Diarrhea
  - Increased frequency defined as more than 3 bowel movements per day
    - Or
  - Increased volume of stool
    - > 200 grams/day
  - Acute < 2 weeks duration
  - Persistent 2-4 weeks in duration
  - Chronic > 4 weeks duration

Important Host Defense Systems

- Barrier
  - Gastric acidity
  - Mucosal integrity
- Intestinal Motility
  - Peristalsis
- Intestinal Immunity
  - Phagocytic
  - Cellular
  - Humoral

Important Virulence Factors

- Inoculum size
- Invasiveness
- Toxins
  - Enterotoxin
  - Cytotoxins
  - Neurotoxins

Case

- T 39.6C,P 126, R 24
- Cachectic, lethargic and dehydrated
- Tongue coated, thrush on buccal mucosa
- Chest clear
- Heart no murmurs
- Abdomen: mildly distended with bilateral lower quadrant tenderness and hyperactive bowel sounds, no hepatosplenomagaly
- Rectal exam: blood-tinged mucous; stool has currant jelly appearance

Cunha, Burke . ***Infectious Diseases Pearls. Hanley & Belfus Inc, 1999***

Currant Jelly

Case

- Stool cultures grew
  - *S. flexernii*
- Patient tested positive for HIV
  - CD4 count <20
- The patient died 4 days after admission

http://www.textbookofbacteriology.net/Shigella.gif

Dysentery

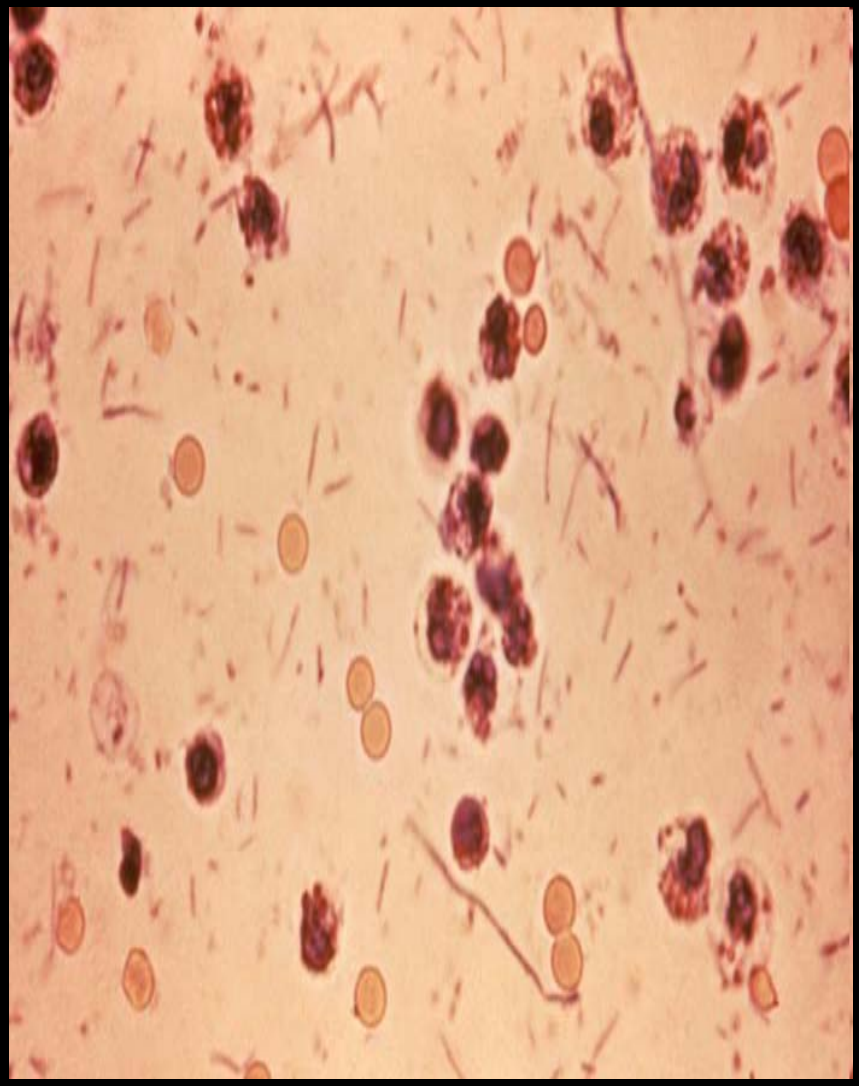
- An infection of the digestive system that results in severe diarrhea containing mucus and blood in the feces.
- Dysentery is typically the result
- There are two major types of dysentery due to micro-organisms:
  - **amoebic dysentery**
  - **bacillary dysentery**

Dysentery

- Amebic dysentery
  - *Entamoeba histolytica*
- Bacillary dysentary
  - Shigellosis is caused by one of several types of *Shigella* bacteria
  - Campylobacteriosis caused by any of the dozen species of *Campylobacter*
  - Salmonellosis caused by *Salmonella enterica* (serovar *Typhimurium*)

Shigella

- Gram negative
- Rod shaped
- Non-spore forming
- Aerobic
- Classic agent of dysentery



Shigella

- The most commonly affected group is children aged 6 months to 10 years
- Shigella species are human pathogens, transmitted from person to person by the fecal-oral route
  - Crowded unsanitary conditions
  - Contaminated food and water
  - Male homosexuals are known reservoirs
  - Immunocompromised patients are predisposed to greater severity of illness and increased mortality

Shigella

- Four species of *Shigella* cause disease in humans
  - *S. dysenteriae and S. flexnerii- cause most severe illness and are associated with epidemics of dysentery and high mortality*
  - *S. sonnei, and S. boydii*
    - *Cause a self limited, watery diarrhea, less severe*
    - *S. sonnei is the most commonly isolated species of shigella both in the USA and in the industrialized world*

Shigella

- Infection with *Shigella* spp occurs after ingestion of contaminated food or water
- Ingestion of as few as 10 to 100 organisms has been shown to cause disease in volunteers
  - Low inoculum
- Shigella are relatively resistant to killing by stomach acid.
  - Ingested bacteria pass into the small intestine where they multiply, so that several logs more bacteria pass into the colon

Shigella

- Shigella produces disease first by invading the intestinal mucosa of the colon and rectum
- Invasion is superficial, rarely penetrating beyond the mucosa
  - Blood cultures will rarely be positive
- One the organisms are intracellular, they multiply in the cytoplasm and move from cell to cell via an actin mediated mechanisms

Shigella Virulence

- Invasiveness is the primary virulence factor
- Toxin production
  - (Shiga toxin- *S.dysenterae*)
- Invasion +toxins results in local, destruction and inflammation of the colon
- Microabsesses and abscess formation

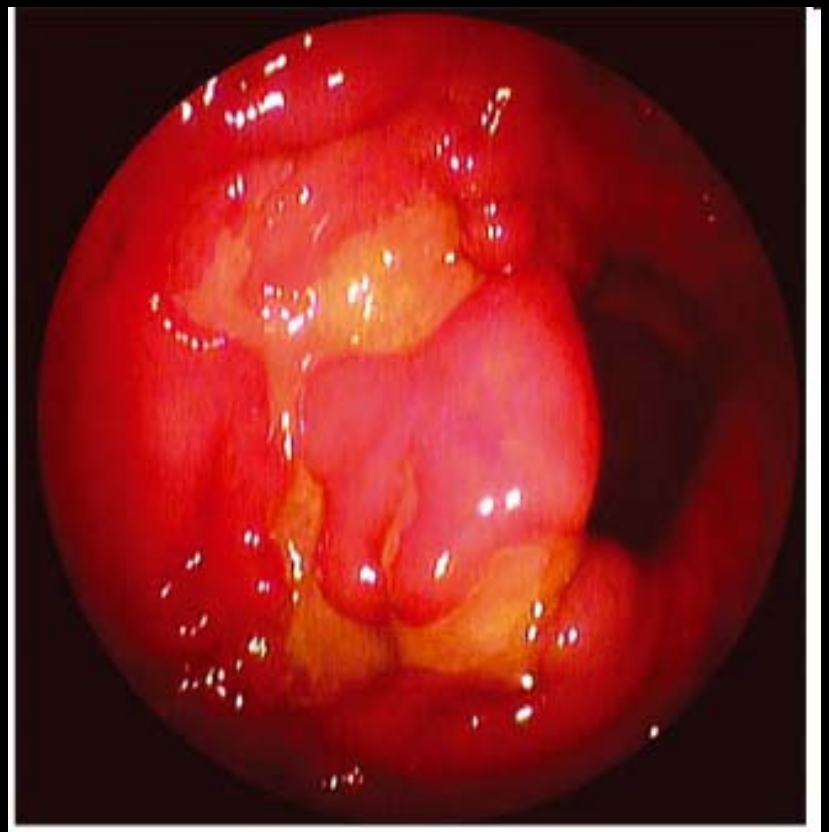


Fig. 7. Similar to the previous image, with ulcers and edematous mucosal islets.
Imagen similar a la anterior, con úlceras e islotes de mucosa edematosa.

http://scielo.isciii.es/img/revistas/diges/v98n3/conferencia_f7.jpg

Fecal leukocytes

- The presence of fecal leukocytes suggest an inflammatory process

Symptoms	Shigella	Amebic Dysentery	Salmonella
Onset	Acute	Insidious/Abrupt	Subacute
Incubation	<24hrs	20-90 days	8-48 hours
Vomiting/Nausea	Absent	Absent	Common
Fever	Common	Common	Common
Shaking Chills	Multiple	None	Single initial chill
Tenesmus	Common/Severe	Uncommon/mild	Uncommon
Abdominal Pain	Severe and maximal over RLQ	Cecal tenderness	Generalized

Dysentery Treatment

- If untreated, bacillary dysentery lasts for about 1 week
  - Symptoms can persist for a month
- Antibiotic treatment decreases the duration of symptoms and decreases fecal shedding of organisms
  - TMP-SMX or fluroquinolone
  - IV antibiotics and fluids may be needed in severely ill patients with dehydration

Picnics and Illness

Case

- 41 year old Caucasian woman attends a picnic during mid-day
- 8 hours later, she reports nausea, vomiting, abdominal cramps and several loose stools
- Her husband, who also attended the picnic, is ill with similar symptoms

Case

- T 38.2C,P 88, R 24
- Well nourished, not in distress
- Oral mucosa moist, no lesions
- Chest clear
- Heart no murmurs
- Abdomen:not distended, bowel sounds hyperactive, not tenderness or hepatosplenomagaly
- Rectal exam: brown stool, heme test negative

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MMWR Weekly

April 15, 1983 / 32(14);183-4,189

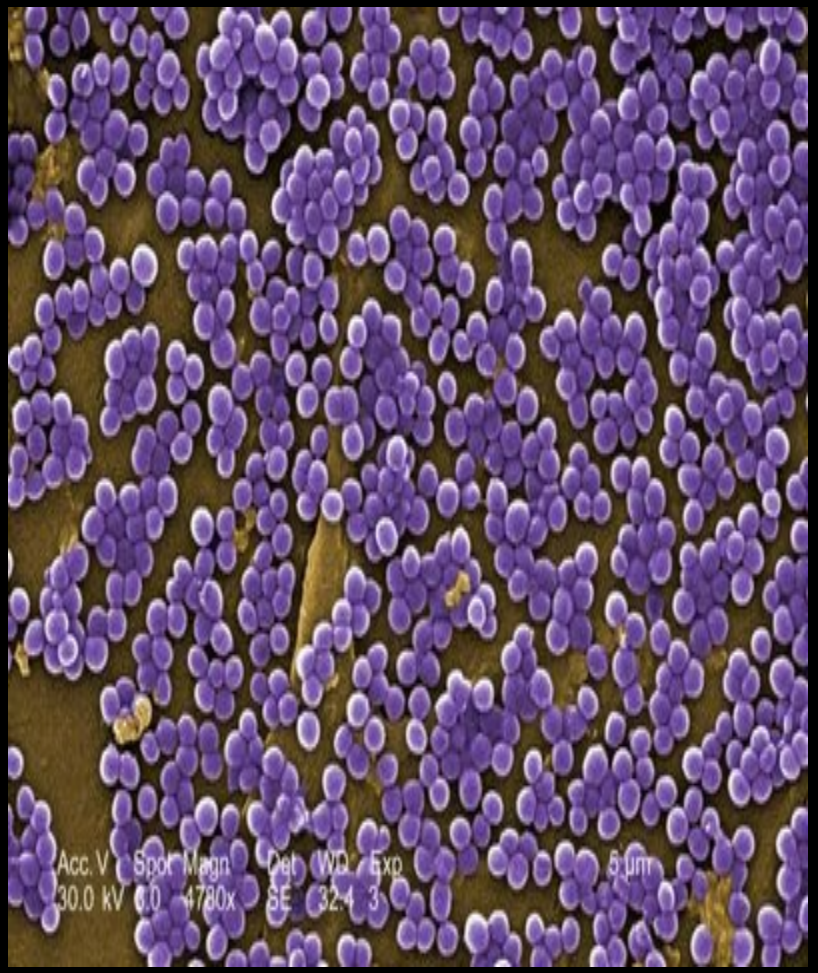
Interstate Common-Source Outbreaks of Staphylococcal Food Poisoning -- North Carolina, Pennsylvania

From July 21 to August 4, 1982, three outbreaks of acute gastroenteritis associated with a single Pennsylvania caterer and caused by Staphylococcus aureus phage type 53 were reported to CDC. Two outbreaks were linked to a specialty ham product, which had been produced in Brooklyn, New York, and distributed to five states, and one was associated with a stuffed chicken-breast product.

North Carolina: On July 21, 14 cases of acute gastrointestinal illness occurred among 41 persons traveling by bus from Allegheny County, Pennsylvania, through Iredell County, North Carolina. Box lunches, containing ham-and-cheese sandwiches prepared by an Allegheny County caterer, had been served to the passengers after more than 5H hours without refrigeration. Symptoms included vomiting (86%), abdominal cramps (86%), nausea (79%), diarrhea (69%), dizziness or weakness (69%), and fever (14%). The incubation period was 2H-5 hours (mean 3T hours). All affected persons sought medical aid at a hospital in Iredell County; nine were hospitalized.

Food histories obtained from 39 passengers implicated the ham-and-cheese sandwiches as the vehicle of transmission. Fourteen (38%) of 37 persons who ate the sandwiches became ill, and none (0/2) of those who had not eaten them became ill, (p 0.05). Stool cultures from four of nine hospitalized persons were positive for S. aureus phage type 53, which was also isolated from the ham-and-cheese sandwiches; enterotoxin tests of the sandwiches revealed preformed enterotoxin type A.

- *Staphylococcus aureus* is a common bacterium found on the skin and in the noses of up to 25% of healthy people and animals
- *Staphylococcus aureus* has the ability to make different toxins that are frequently responsible for food poisoning



Staphylococcal Food Poisoning

- Staphylococcal food poisoning is a gastrointestinal illness caused by eating foods contaminated with toxins produced by *Staphylococcus aureus*
- Contamination with *Staphylococcus* occurs through contact with food workers who carry the bacteria or through contaminated milk and cheeses
- *As Staphylococcus* multiplies in food, it produces toxins that can cause illness
- Staphylococcal toxins are resistant to heat and cannot be destroyed by cooking

Staphylococcal Food Poisoning

- High risk foods for *S. aureus* contamination and subsequent toxin production are those that are made by hand and require no cooking

Examples of foods associated with staphylococcal food poisoning are sliced meat, puddings, potato salads, coles slaw and some pastries and sandwiches

Staphylococcal Food Poisoning

- Staphylococcal toxins are fast acting
  - Illness can ensue in as little as 30-60 minutes.
  - Symptoms usually develop within one to six hours after eating contaminated food.
- Patients typically experience several of the following:
  - nausea, vomiting, stomach cramps, and diarrhea
- The illness is usually mild and most patients recover after one to three days

Staphylococcal Food Poisoning

- Classic toxin of Staphyloccocal food poisoning
  - Water soluble, heat stabile (100C), can survive in freeze dried state for up to one year
- Consumption of the toxin-contaminated food will usually lead to the rapid onset of symptoms (6 to 12 hours) that are predominantly upper intestinal
  - *Staphylococcus aureus*
  - *Bacillus cereus and botulism*

Staphylococcal Food Poisoning

- Staphylococcal food poisoning will cause a brief, self-limited illness
- Treatments is rest, fluids, and anti-emetics
- Elderly or debilitated patients with dehydration may require intravenous hydration therapy and care in a hospital.
- Antibiotics are not useful in treating this illness.
  - The toxin is not affected by antibiotics

Most common microbial causes of foodborne disease

Disease or agent	Estimated total cases	Percent foodborne transmission	Percentage of deaths*
Norwalk-like viruses	23,000,000	40	7
Campylobacter spp	2,500,000	80	5
Giardia lamblia	2,000,000	10	0.1
Salmonella	1,400,000	95	31
Shigella	450,000	20	0.8
Cryptosporidium parvum	300,000	10	0.4
Clostridium spp	250,000	100	0.4
Toxoplasma gondii	225,000	50	21
Staphylococcal food poisoning	185,000	100	0.1
Shiga toxin producing E. coli	110,000	85	1.4
Yersinia enterocolitica	100,000	90	0.1
Bacillus cereus	27,000	100	0
Cyclospora cayetanensis	16,000	90	0
Listeria monocytogenes	2,500	99	28

* Expressed as a percentage of the number of deaths related to foodborne pathogens.
Modified from Mead, PS, Slutsker, L, Dietz, V, et al. Emerg Infect Dis 1999; 5:607.

http://www.utdol.com/online/content/image.do;jsessionid=9686AB12BD3BB068696363E262BA1E96.0503?imageKey=id_pix/foodborn.htm

Case

- 24 year old Caucasian woman, medical student
- Travels to Honduras to participate in the VCU HOMBRE program
- On day 6 of the trip, she experiences nausea, no vomiting, but 3-5 loose bowel movements, lasting 2-3 days
- No fever, tenesmus or abdominal pain or cramping are reported

Case

- T 38.2C,P 75, R 17
- Well nourished, not in distress
- Oral mucosa moist, no lesions
- Chest clear
- Heart no murmurs
- Abdomen:Not distended, bowel sounds normal, not tender no hepatosplenomagaly
- Rectal exam: not done

Traveler’s Diarrhea

- Traveler's diarrhea is the most common illness in persons traveling from resource-rich to resource-poor regions of the world
- 40 to 60 percent of travelers to these countries may develop diarrhea
- Episodes of travelers' diarrhea (TD) are nearly always benign and self-limited
  - Dehydration can complicate an episode and this may be severe and pose a greater health hazard than the illness itself

Traveler's Diarrhea

- Classic
  - Passage of three or more unformed stools in a 24 hour period
  - Plus at least one of these other symptoms:
    - Nausea
    - Vomiting
    - Abdominal pain or cramps
    - Fever
    - Blood in stools (uncommon)

Traveler's Diarrhea

- Diarrheal disease in travelers may be caused by a variety of bacterial, viral, and parasitic organisms, which are most often transmitted by food and water
- More than 90 percent of illnesses in most geographic areas are caused by bacteria; the most common organism is enterotoxigenic *Escherichia coli* (ETEC)

Traveler's Diarrhea

- Enterotoxigenic E.coli
  - Produces heat labile and stabile toxins:
    - Toxins act by stimulating adenylate cyclase and increasing intracellular cyclic AMP/GMP, which results in secretion of chloride from intestinal crypt cells and inhibition of absorption of sodium chloride at the villus tips
      - Small Bowel involvement
    - The secretion of free water follows these changes
    - The result is a watery diarrhea

Clinical syndromes associated with diarrheagenic Escherichia coli

Strain	Syndrome
Enterotoxigenic E. coli (ETEC)	Watery diarrhea
Enteropathogenic E. coli (EPEC)	Infantile diarrhea
Enterohemorrhagic E. coli (EHEC)	Hemorrhagic colitis and hemolytic uremic syndrome
Enteroinvasive E. coli (EIEC)	Dysentery
Enteroaggregative E. coli (EAEC)	Persistent diarrhea in children and patients infected with HIV

http://www.utdol.com/online/content/image.do;jsessionid=9686AB12BD3BB068696363E262BA1E96.0503?imageKey=id_pix/foodborn.htm

The Causes of Traveler's Diarrhea are Multiple

Pathogens causing travelers' diarrhea

Bacteria
Enterotoxigenic Escherichia coli
Enteroaggregative E. coli
Campylobacter jejuni
Salmonella species
Shigella species
Clostridium difficile
Vibrio parahaemolyticus (V. cholerae less common)
Aeromonas hydrophilia
Plesiomonas shigelloides
Yersinia enterocolitica
Viruses
Rotavirus
Enteric adenovirus
Parasites
Giardia lamblia
Cryptosporidium parvum
Cyclospora cayetanensis

http://www.utdol.com/online/content/image.do;jsessionid=9686AB12BD3BB068696363E262BA1E96.0503?imageKey=id_pix/traveler.htm

Case

- A 51-year-old woman was brought to the hospital after a close friend found her semiconscious, obtunded, and listless
- On Sunday, she appeared healthy, alert, and talkative. The next morning, she began to experience episodic chills lasting 30 to 40 minutes
- That evening, her lethargy was pronounced.
- The patient had a medical history of chronic active hepatitis B virus (HBV) infection

Resident & Staff Physician
A Peer-Reviewed Medical Education Journal

http://www.residentandstaff.com/article.cfm?ID=281

Case

- In the ED, she was lethargic and diaphoretic
- She was tachypneic (25-32 breaths/min) & mildly tachycardic (95-105 beats/min), temperature was 103°F and systolic blood pressure between 90 and 100 mm Hg
- Her sclera were icteric, skin was jaundiced with mild generalized edema
- Auscultation of her abdomen revealed decreased bowel sounds.
- Palpation of the abdomen revealed diffuse tenderness, and a liver edge was noted 2 to 3 cm below the costodiaphragmatic angle

Resident & Staff Physician
A Peer-Reviewed Medical Education Journal

http://www.residentandstaff.com/article.cfm?ID=281

Case

- Edema of the legs was noted, with the right being more swollen than the left
- The right leg was erythematous and exquisitely tender
- Two prominent blisters, approximately 4 and 6 cm in diameter, soft and compressible and filled with serous fluid

Figure 2—Dorsum of patient's right foot.

http://www.residentandstaff.com/article.cfm?ID=281

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Case

- On the third day-debridement of the right leg was necessary
- The surgical specimen taken from the right ankle grew a bacillus species later identified as *Vibrio vulnificus*
- *It was discovered that she had purchased and eaten raw oysters*

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http://www.residentandstaff.com/article.cfm?ID=281

Vibrio vulnificus

<> June 04, 1993 / 42(21);405-407

Vibrio vulnificus Infections Associated with Raw Oyster Consumption -- Florida, 1981-1992

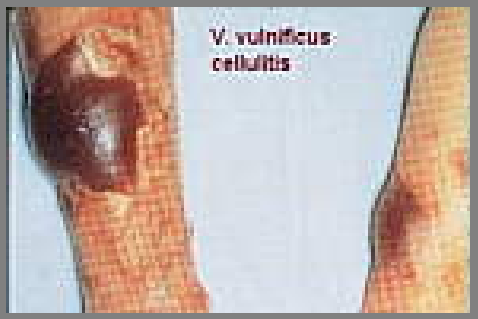
<> July 26, 1996 / 45(29);621-624

Vibrio vulnificus Infections Associated with Eating Raw Oysters -- Los Angeles, 1996

Vibrio vulnificus

Vibrio vulnificus **causes wound infections, gastroenteritis or a serious syndrome known as "primary septicema."**

Vibrio vulnificus

Mode of Transmission	Clinical Manifestations	Dermatologic Manifestations
Transmitted to humans through open wounds in contact with seawater or through consumption of certain improperly cooked or raw shellfish. AVOID RAW CLAMS and OYSTERS!	-Gastroenteritis: usually develops within 16 hours of eating the contaminated food -Sepsis: 60% case fatality Over 70 percent of infected individuals have distinctive bullous skin lesions.	From hematogenous spread or from direct innoculation Bullous skin lesions 

Vibrio vulnificus

Vibrio vulnificus

- **High Risk Conditions Predisposing to *Vibrio vulnificus* infection:**
  - **Liver disease, either from excessive alcohol intake, viral hepatitis or other causes**
  - **Hemochromatosis**
  - **Diabetes mellitus**
  - **Stomach problems, including previous stomach surgery and low stomach acid (for example, from antacid use)**
  - **Immune disorders, including HIV infection**
  - **Long-term steroid use (as for asthma and arthritis).**

Vibrio vulnificus

Diagnostic Pearls	Culture
-A physician should suspect V. vulnificus if a patient has watery diarrhea and has eaten raw or undercooked oysters or when a wound infection occurs after exposure to seawater	**Vibrio organisms can be isolated from cultures of stool, wound, or blood** **the laboratory should be notified as a special growth medium is preferred**
	RX: **Doxycycline or a third-generation cephalosporin (e.g., ceftazidime)**

Case

- 50 year old woman presents to the office with a 3 day history of watery diarrhea accompanied by crampy abdominal pain
- She is having 10-12 bowel movements in a 24 hour period and is awakened from sleep to use the bathroom
- She has low grade fever, but denies nausea, vomiting and blood in the stool
- Two weeks ago she was treated with a course of ampicillin for an *E.coli* infection of the urinary tract

Case

- T 38, P 92, RR 12, BP 122/80
- General: well nourished
- HEENT: dry mucous membranes
- Cardiac- normal
- Chest- clear
- Abdomen- soft, diffuse, mild tenderness to the right and left lower quadrants; bowel sounds hyperactive
- Rectal: trace heme positive stools
- Extremity and skin: no edema, no rashes

Case

- WBC 16,200/uL
  - 90% Neutrophils
  - 8% Bands
  - 2% Lymphocytes
- Bun 40 mg/dL
- Creat 1.2mg/dL
- Sigmodoscopy:

Clostridium difficile

- *Clostridium difficile* is a gram-positive, anaerobic, spore-forming bacillus that is responsible for the development of antibiotic-associated diarrhea and colitis

Epidemiology

- *C. difficile* cultured from the stool of 3% of healthy adults and up to 80% of healthy newborns and infants
- Stool carriage of *C. difficile* reaches 16–35% among hospital inpatients.
- *C. difficile* persists in the stools of 10–40% of patients with CDAD regardless of antibiotic treatment
- Contaminated environmental surfaces, other patients with CDAD and hand carriage on the part of healthcare personnel are important reservoirs for cross transmission

Aslam S, et al. *Lancet Infect Dis* 2005; 5: 549–557.

Mcfarland LV et al. *N Engl J Med* 1989; 320: 204–210.

Risk Factors and Pathophysiology

- C. *difficile* is more likely to cause clinical disease in patients who are newly exposed
- Patients who are already colonized with *C. difficile* typically remain asymptomatic during their hospital stay

Johnson S et al. *Lancet* 1990; 336:97.

Shim, JK et al. *Lancet* 1998; 351:633

Risk Factors and Pathophysiology

- The association of developing *C. difficile* infection following exposure to antibiotic is well defined
  - The probability of CDAD is greatest with Clindamycin and Ampicillin
  - Fluoroquinolones are now increasingly associated with CDAD

Gurwith MJ et al. *J Infect Dis* 1977; 135 Suppl:S104.

Pepin, et al *Clin Infect Dis* 2005; 41:1254.

Loo, VG et al *N Engl J Med 2005*; 353:2442.

Muto et al. *Infect Control Hosp Epidemiol* 2005; 26:273.

Antibiotics and CDAD

Highly associated	**Moderately Associated**	**Rarely Associated**
Ampicillin Amoxicillin Cephalosporins Clindamycin	Other Beta-lactam antibiotics Sulfonamides Erythromycin Trimethoprim Quinolones	Parenteral Aminoglycosides Tetracylcines Chloramphenicol Metronidazole Vancomycin

Toxins

- Enterotoxin A
  - Causes fluid accumulation in the bowel
- Cytotoxin B
  - Cytopathic toxin
    - Promotes cell lysis and death

***C. difficile* endospores**

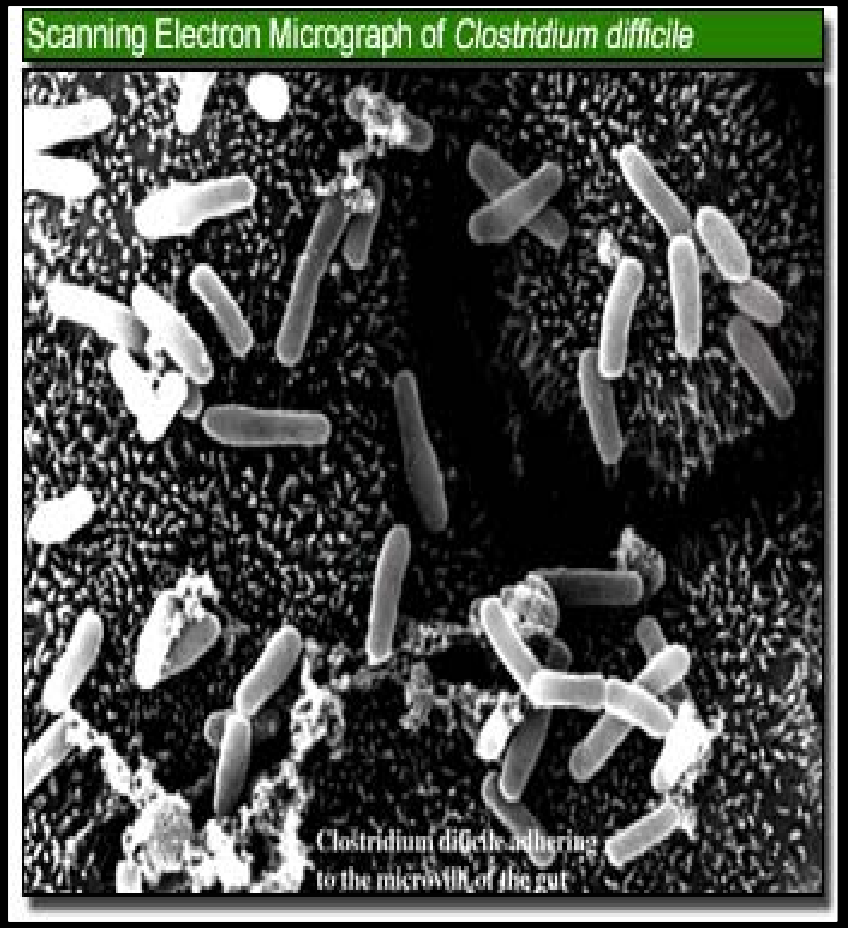
Pathophysiology

- ***C. difficile*** **toxins A and B are large proteins**

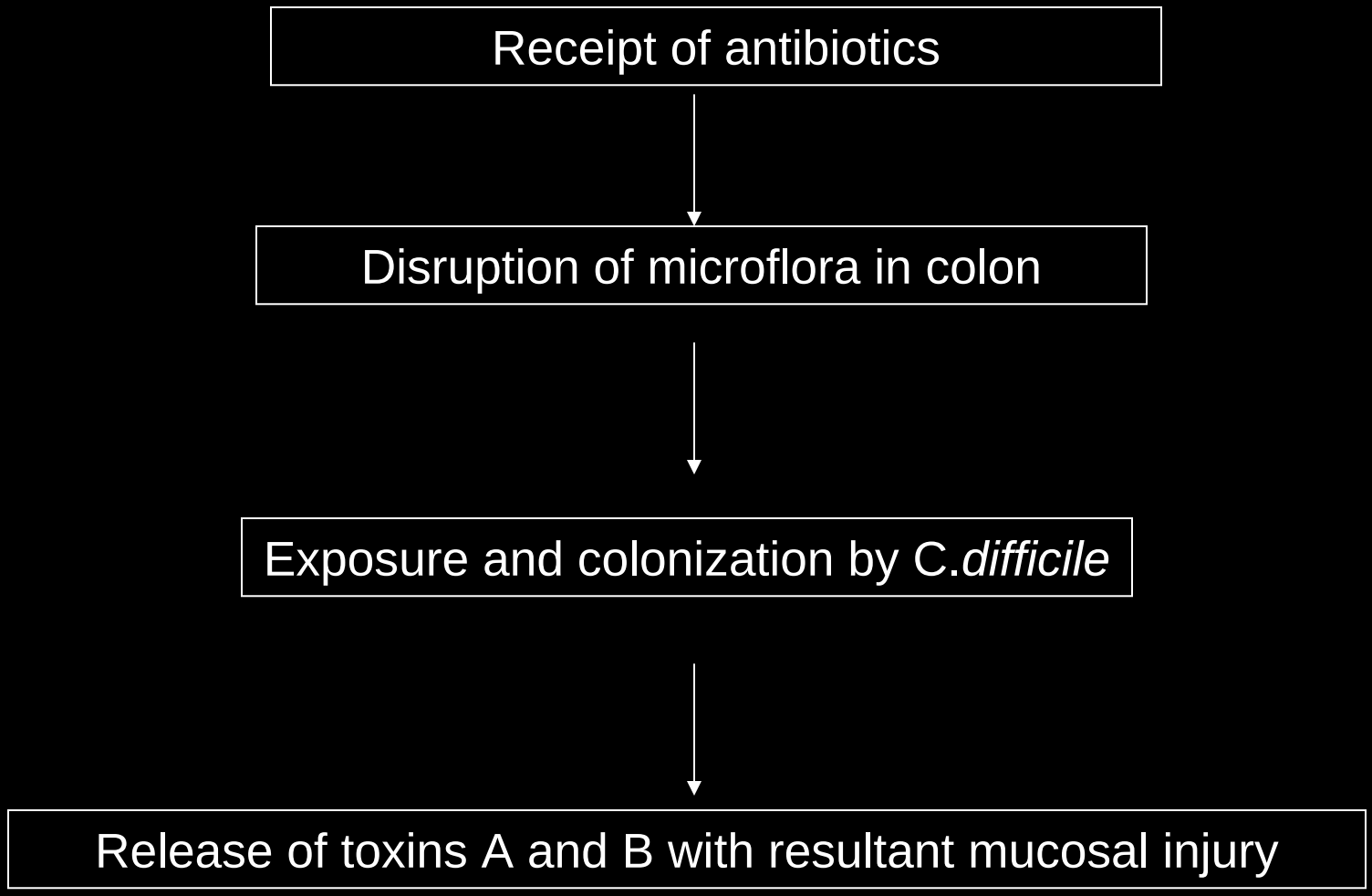
  (308 kDa and 275 kDa)

- **Both toxins adhere to receptors on the human colonocyte brush border and cause:**

  - **Necrosis**
  - **Shedding of cells into the GI lumin**



Risk Factors and Pathophysiology



Carrier State

- Once infected, 2/3 of infected hospitalized patients remain asymptomatic
  - Carriers are reservoirs of toxigenic organisms
- Routine treatment of carriers is not recommended
  - Treatment of carriers may be employed during hospital outbreaks
    - Elimination of the organism from the hospital environment

McFarland, LV et al. *N Engl J Med* 1989; 320:204.

Johnson, S et al. *Ann Intern Med* 1992; 117:297.

Antibiotic Associated Diarrhea Without Colitis

- Common in hospitalized patients
- Diarrhea is mild
  - 3-4 loose watery stools per day
  - Cramping
- Physical examination is normal with only minimal lower abdominal tenderness
- Fever, leukocytosis, and dehydration are mild or absent
- *C. difficile* toxins present in stool
- Sigmoidoscopic examination is normal

Antibiotic Associated Colitis Without Pseudomembrane Formation

- Abdominal pain, nausea, anorexia
- Profuse watery diarrhea of 5 to 15 watery bowel movements per day
- Left or right lower quadrant abdominal pain and cramps
- Fever and dehydration
- Sigmoidoscopic examination may reveal a nonspecific diffuse or patchy erythematous colitis without pseudomembranes

Pseudomembranous Colitis

- Appears as raised yellow or off-white plaques ranging up to 1 cm in diameter scattered over the colorectal mucosa
- Similar clinical symptoms of diarrhea, fever, leukocytosis and abdominal pain

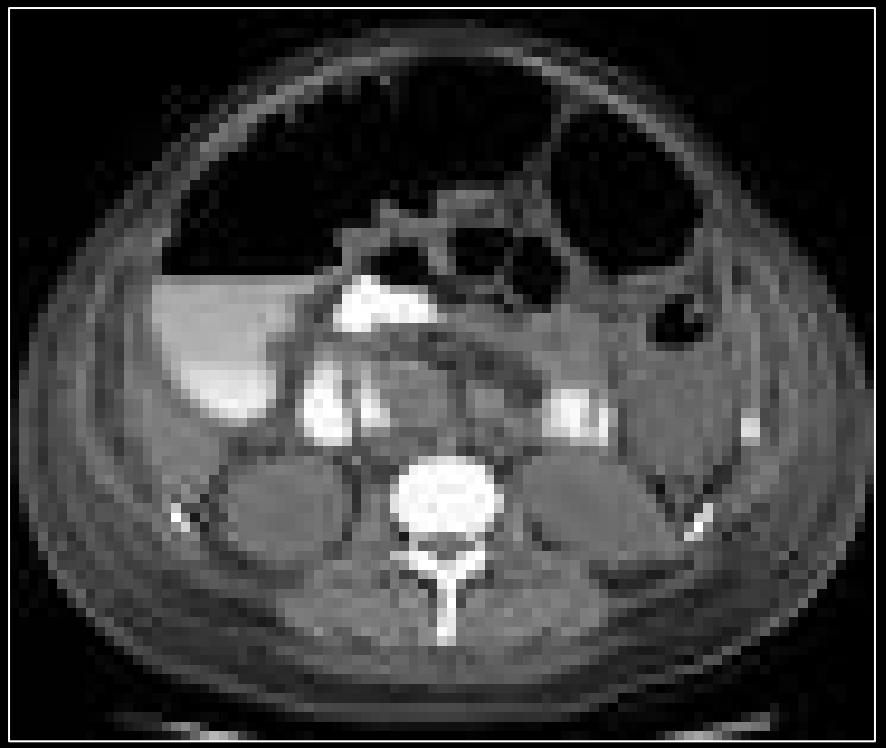
Histopathology of pseudomembranous colitis

- **The pseudomembrane membrane is composed of fibrin**
- **Adheres to the damaged colon surface and blocks the absorptive surface layer further adding to diarrhea**

http://www.pathguy.com/~tdemark/0075.htm

Pseudomembranous colitis

Axial CT images show distention and significant colonic wall thickening of the transverse and sigmoid colon



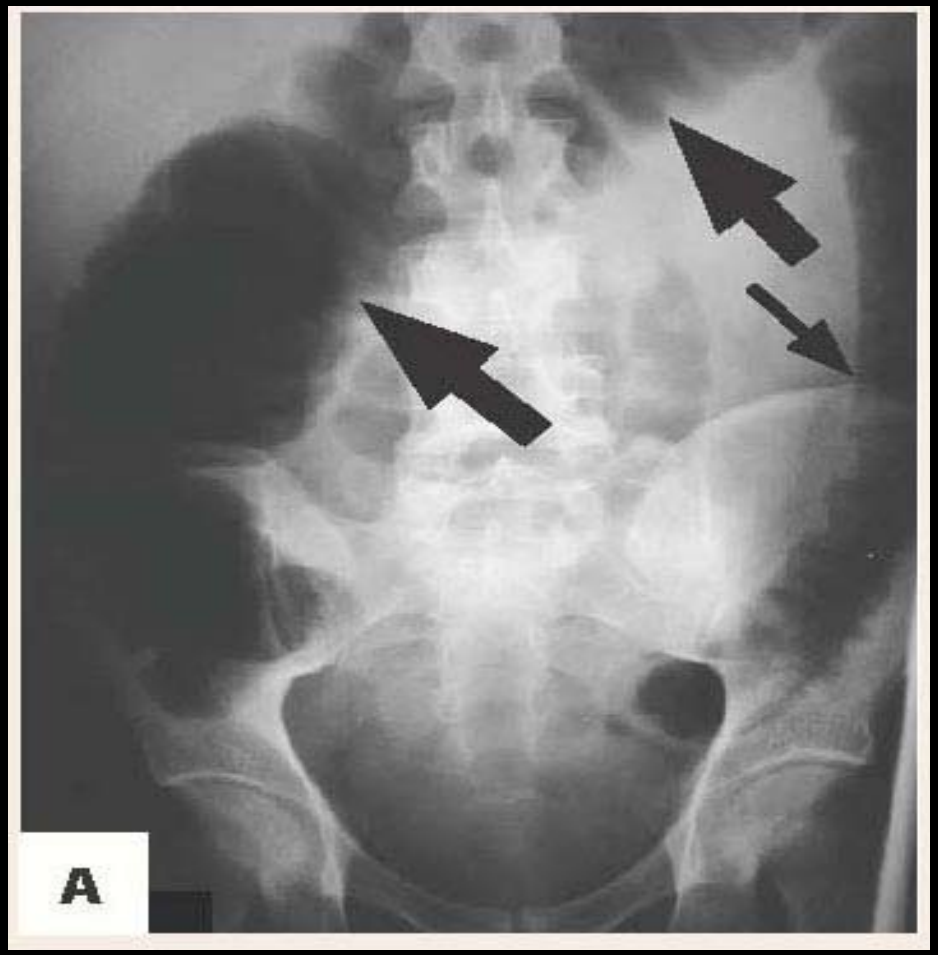
rad.usuhs.edu/.../thumb/synpic26179.jpg

Fulminant Colitis and Toxic Megacolon

- 2 or 3 percent of patients
- Marked leukocytosis (>30,000 to 40,000 WBC/microL)
- Fever, chills, dehydration and metabolic (lactic) acidosis
- Diarrhea is prominent
  - However, diarrhea is less prominent in patients with ileus and secondary pooling of secretions in the dilated, adynamic colon

Toxic Megacolon

- Diagnosis based upon the finding of an enlarged dilated colon
  - >7 cm in its greatest diameter
- Accompanied by severe systemic toxicity



http://www.cfpc.ca/cfp/2004/Nov/_images/Fig0376_104_A.jpg

Hospital-acquired *Clostridium difficile-associated* disease in the intensive care unit setting: epidemiology, clinical course and outcome

- Historical cohort study on 58 adults with *CDAD* occurring in intensive care units at VCUMC.
- In ICU patients with CDAD, advanced age and increased severity of illness at the onset of infection were independent predictors of death
- The in-hospital mortality was 27.6%

Marra A, Edmond MD, Wenzel RP and Bearman G. *BMC Infectious Diseases* 2007, 7:42

ELISA for Toxin Detection

- Rapid assays with comparable sensitivity (70 to 90 percent) and specificity (99 percent)
- Some detect Toxin A only
  - Toxin A variant strains (toxin A-negative, toxin B-positive strains) relatively infrequent
    - (1-2% of all isolates)

Barbut, F et al. *J Clin Microbiol* 2002; 40:2079.

Treatment

Mild CDAD	**•Discontinue offending antibiotic** **•Oral Metronidazole**
Moderate to severe	**•Oral vancomycin** **•Oral metronidazole** **•IV metronidazole (ileus) + oral vancomycin via NG tube** **•Antibiotics + IVIG**
Recurrences	**•Repeat metronidazole therapy** **•Repeat Vancomycin therapy** **•Nitazoxanide**
Severe ileus, toxic megacolon	**•Surgical evaluation for complete colectomy**

Case

- “An Anchorage woman reported that she and her husband had become ill about one-half hour after consuming a meal of marinated raw salmon. Illness consisted of generalized hives, a brassy taste, flushing, abdominal cramps, nausea, and vomiting without diarrhea. Symptoms persisted for four hours.”

Case


State of Alaska Epidemiology Bulletin

Copies of any bulletin may be ordered by calling the Section of Epidemiology at (907) 269-8000 or by writing to us at PO Box 240249, Anchorage, Alaska 99524-0249

- “August 12th, a Valdez physician informed our office that three days previous she had treated nine Japanese sailors for an illness which began one hour after eating a meal of mixed raw cod, flounder and salmon.”
- “Illness was said to have affected most of the 23 man crew, but only nine were seen by the doctor. “
- “She found tachycardia in two, hives in four, nausea in eight, and vomiting in two. No respiratory difficulty was noted. Treatment included emetics, antihistamines, and epinephrine.”
- “Symptoms resolved by morning and the crew left for Japan with a cargo of refrigerated raw fish.”

Is this an allergic reaction to fish?

Scombroid

- Scombroid fish poisoning is a food-related illness typically associated with the consumption of fish.
  - Scombroidea fish
    - Large dark meat marine tuna, albacore, mackerel, skipjack, bonito, marlin Mahi-Mahi

Scombroid

Symptoms are related to the ingestion of biogenic amines, especially *histamine*.

Serum histamine levels and urinary histamine excretion are elevated in humans with acute illness.

The result is a massive histamine like reaction

Cooking does not inactivate the toxin!

Scombroid

Clinical Presentation	Dermatologic Manifestations
The onset of symptoms is 10-30 minutes after ingestion the fish, which is said to have a characteristic *peppery bitter* taste. **Flushing** **Palpitations** **Headache** **Nausea and Diarrhea** **Sense of anxiety** **Prostration or loss of vision (rare)** **Tachycardia and wheezing** **Hypotension or hypertension**	**Nonspecific: diffuse, macular, blanching erythema and hives** 

Scombroid

Diagnostic Pearls	Management
• Disease of acute onset and short duration •Diagnosis is clinical; no laboratory tests are necessary. •If the diagnosis requires confirmation, histamine levels can be measured in a the suspect frozen fish	•ECG, IV access, oxygen, and cardiac monitoring as needed. •Treat bronchospasm as needed •Treat with antihistamines: H1- and H2-blockers. •Consider use of activated charcoal only if presentation is very early and a large amount of fish was ingested.

Enteric Infections