

***Clostridium difficile* is a spore-forming Gram-positive rod primarily associated with which condition?**

- A. Foodborne botulism
- B. Necrotizing fasciitis
- C. Antibiotic-associated diarrhea
- D. Wound infections

Answer : C

**Which of the following is the primary reservoir for *Clostridium tetani* spores?**

- A. Contaminated food
- B. Soil
- C. Water
- D. Animal feces

Answer : B

**Which of the following toxins is produced by *Clostridium perfringens* and is responsible for gas gangrene?**

- A. Alpha toxin
- B. Botulinum toxin
- C. Tetanospasmin
- D. Enterotoxin

Answer : A

**Which species is associated with food poisoning due to toxin production after improper reheating of rice?**

- A. *Clostridium difficile*
- B. *Clostridium perfringens*
- C. *Bacillus cereus*
- D. *Clostridium botulinum*

Answer : C

**Which of the following non-spore-forming Gram-positive rods is an important cause of neonatal meningitis?**

- A. *Listeria monocytogenes*
- B. *Corynebacterium diphtheriae*
- C. *Lactobacillus acidophilus*
- D. *Propionibacterium acnes*

Answer : A

**Which of the following characteristics helps differentiate *Actinomyces* from *Nocardia*?**

- A. Gram-positive staining
- B. Presence of branching filaments
- C. Acid-fast staining (positive in *Nocardia*)
- D. Obligate anaerobic growth

Answer : C

**Which of the following Gram-positive rods is often used in probiotics?**

- A. *Corynebacterium diphtheriae*
- B. *Lactobacillus acidophilus*
- C. *Listeria monocytogenes*
- D. *Cutibacterium acnes*

Answer : B

**What is the main mechanism of action of diphtheria toxin?**

- A. Inhibition of protein synthesis by ADP-ribosylating elongation factor 2 (EF-2)
- B. Damage to cell membranes by pore formation
- C. Activation of macrophages to release cytokines
- D. Destruction of DNA by nuclease activity

Answer : A

A 45-year-old male presents with a hard, painless swelling on the lower jaw that has been slowly growing over the past few months. He reports a history of recent dental extractions. Physical examination reveals a draining sinus tract with yellowish granules.

**Question:** What is the most likely causative agent of his condition?

- A. *Clostridium tetani*
- B. *Listeria monocytogenes*
- C. *Actinomyces israelii*
- D. *Bacillus anthracis*

Answer : C

# ***Enterotoxigenic E. coli (ETEC)***

A second-year medical student experiences **watery diarrhea** and mild **abdominal cramps** during his 2-week travel to Egypt. With his little medical knowledge, he makes several assumptions, which of those assumption is **false**?

- a) This is probably a case of traveler's diarrhea that should resolve within a few days.
- b) Enterotoxigenic *E. coli* (ETEC) is a probable causative agent.
- c) He would not have become sick if he washed his hands properly.
- d) Liquids are important to prevent dehydration and loss of electrolytes.
- e) If it is traveler's diarrhea, he probably contracted the pathogen in a meal he ate 2 days ago.

Answer : C

# ***Enterotoxigenic E. coli (ETEC)***

The Enterobacteriaceae is a family of bacteria that:

- A. Consists of gram-positive rods
- B. Is commonly associated with skin infections
- C. Are usually sensitive to a wide range of antibiotics.
- D. Can be part of the human intestinal microbiota but can also cause human intestinal disease.
- E. Share a thick layer of peptidoglycan.

Answer : D

Escherichia coli is the most common cause of one of the following diseases:

- A. Meningitis
- B. Urinary tract infections
- C. Pneumonia
- D. Central venous catheter related blood stream infections
- E. Folliculitis

Answer : B

**Which of the following media is selective and differential for Enterobacteriaceae?**

- A. Blood agar
- B. MacConkey agar
- C. Chocolate agar
- D. Sabouraud agar

Answer : B

**Which of the following is NOT a characteristic feature of Enterobacteriaceae?**

- A. Gram-negative rods
- B. Ferment glucose
- C. Oxidase-positive
- D. Facultative anaerobes

Answer : C

**What component of the *Enterobacteriaceae* cell wall is responsible for triggering a strong immune response?**

- A. Lipid A of lipopolysaccharide (LPS)
- B. Peptidoglycan layer
- C. Outer membrane proteins
- D. Teichoic acids

Answer : A



**What is the primary mode of transmission for non-typhoidal *Salmonella* species?**

- A. Contaminated water
- B. Respiratory droplets
- C. Contaminated food, particularly poultry and eggs
- D. Insect vectors

Answer : C

**Case Scenario:** A 6-year-old child in a daycare center develops bloody diarrhea and fever. Stool culture identifies a non-motile, Gram-negative bacillus. What is the most likely pathogen?

- A. *Escherichia coli*
- B. *Salmonella Enteritidis*
- C. *Shigella flexneri*
- D. *Klebsiella pneumoniae*

Answer : C

**Which toxin produced by enterohemorrhagic *Escherichia coli* (EHEC) is responsible for hemolytic uremic syndrome (HUS)?**

- A. Heat-labile toxin (LT)
- B. Heat-stable toxin (ST)
- C. Shiga-like toxin
- D. Endotoxin

Answer : C

**Which *Yersinia* species is associated with the bubonic plague?**

- A. *Yersinia enterocolitica*
- B. *Yersinia pseudotuberculosis*
- C. *Yersinia pestis*
- D. *Yersinia kristensenii*

Answer : C

**Which condition is commonly associated with *Klebsiella pneumoniae* infections?**

- A. Urinary tract infections in young children
- B. Lobar pneumonia with "currant jelly" sputum
- C. Skin abscesses
- D. Diarrheal disease in travelers

Answer : B

**Case Scenario:** A patient with recurrent urinary tract infections has urine cultures showing a swarming Gram-negative rod that is urease-positive. What is the most likely organism?

- A. *Escherichia coli*
- B. *Proteus mirabilis*
- C. *Klebsiella pneumoniae*
- D. *Salmonella Typhi*

Answer : B

A 25-year-old female presents with a urinary tract infection. The causative organism is found to be lactose-fermenting and indole-positive. What is the most likely organism?

- A. *Escherichia coli*
- B. *Klebsiella pneumoniae*
- C. *Proteus mirabilis*
- D. *Salmonella Typhi*

Answer : A

**Which of the following organisms is the most common bacterial cause of gastroenteritis?**

- A. *Vibrio cholerae*
- B. *Campylobacter jejuni*
- C. *Helicobacter pylori*
- D. *Salmonella Typhi*

Answer : B

**Case Scenario: A patient develops profuse, watery "rice-water" stools after consuming contaminated water during a flood. What is the most likely causative agent?**

- A. *Campylobacter jejuni*
- B. *Vibrio cholerae*
- C. *Helicobacter pylori*
- D. *Salmonella Enteritidis*

Answer : B

**Which of the following is the primary virulence factor associated with *Vibrio cholerae* infections?**

- A. Cholera toxin
- B. Urease enzyme
- C. Shiga-like toxin
- D. Lipopolysaccharide (LPS)

Answer : A

**What enzyme produced by *Helicobacter pylori* allows it to survive in the acidic environment of the stomach?**

- A. Catalase
- B. Urease
- C. Coagulase
- D. Oxidase

Answer : B

**What is the role of efflux pumps in bacterial resistance?**

- A. Enzymatically degrade antibiotics
- B. Prevent antibiotic entry into the cell
- C. Actively transport antibiotics out of the cell
- D. Modify antibiotic binding sites

Answer : C

**What is the primary mechanism of resistance to fluoroquinolones in bacteria?**

- A. Production of efflux pumps
- B. Modification of topoisomerase and DNA gyrase enzymes
- C. Enzymatic inactivation of the antibiotic
- D. Alteration of the 30S ribosomal subunit

Answer : B

**A young child presents with meningitis caused by *Streptococcus pneumoniae*. The strain is resistant to penicillin.**

**What is the most likely resistance mechanism?**

- A. Alteration of the 30S ribosomal subunit
- B. Beta-lactamase production
- C. Modification of penicillin-binding proteins
- D. Decreased membrane permeability

Answer : C

**Which of the following strategies is most effective in reducing the development of antimicrobial resistance?**

- A. Using broad-spectrum antibiotics for all infections
- B. Encouraging over-the-counter antibiotic access
- C. Completing prescribed antibiotic courses and limiting unnecessary use
- D. Relying solely on vaccines to control bacterial infections

Answer : C

**Which of the following bacteria is commonly associated with extended-spectrum beta-lactamase (ESBL) production?**

- A. *Escherichia coli*
- B. *Streptococcus pneumoniae*
- C. *Mycobacterium tuberculosis*
- D. *Clostridium difficile*

Answer : A

**Which of the following is NOT part of the ESKAPEE group of pathogens?**

- A. *Enterococcus faecium*
- B. *Escherichia coli*
- C. *Klebsiella pneumoniae*
- D. *Salmonella Typhi*

Answer : D