Escherichia coli Virotypes

PLAY PICMONIC

EIEC

Enteroinvasive E. coli (EIEC)
Invading E-coal-eye
EIEC, or enteroinvasive E. coli, is invasive to the intestinal mucosa, leading to dysentery. The symptomatic manifestations are similar to Shigella, with watery to bloody stool and possible mucus.

Necrosis with Inflammation
Necrosis-crow In-flames
Enteroinvasive E. coli (EIEC) involves invasion of the intestinal mucosa, resulting in necrosis and inflammation.

Bloody Diarrhea
Red Toilet
As enteroinvasive E. coli (EIEC) invades the intestinal mucosa, it can lead to watery/bloody diarrhea and the possibility of mucus (i.e., dysentery). Other symptoms can include abdominal cramping, vomiting, fever, and fatigue.

Clinical Presentation Similar to Shigella
She-Jello in mirror
Enteroinvasive E. coli (EIEC) has a clinical presentation similar to Shigella.

ETEC

Enterotoxigenic E. coli (ETEC)
Toxic-genie and E-coal-eye
ETEC, or enterotoxigenic E. coli, produces two types of enterotoxins, leading to secretory diarrhea. ETEC is the most common cause of traveler's diarrhea.

Heat Labile and Heat Stable Enterotoxin
Heat-lamp with Stable-ground melting Toxin
Enterotoxigenic E. coli (ETEC) does not involve invasion of the intestinal mucosa. Instead, it produces a heat-labile toxin and heat-stable toxin. The heat-labile toxin is part of an AB toxin, similar to cholera, increasing chloride secretion, thereby causing an efflux of water into the intestine. The heat-stable toxin acts differently, decreasing sodium chloride reabsorption, thereby also causing an efflux of water into the intestine. Both toxic effects lead to secretory diarrhea, which is why ETEC is also known as "traveler's diarrhea."

Traveler with Watery Diarrhea
Traveling-backpacker with Watery Toilet
Enterotoxigenic E. coli (ETEC) leads to secretory diarrhea and is non-invasive. Therefore, watery diarrhea is a common presentation. Additionally, fever, nausea, abdominal cramping, and appetite changes may occur.

EPEC

Enteropathogenic E. coli (EPEC)

Pathogen and E-coal-eye

EPEC, or enteropathogenic E. coli, is a non-toxin-producing form of diarrhea and is most common in the pediatric population.

Blocks Absorption

Blocks and Absorbing-sponge

Enteropathogenic E. coli (EPEC) is most common in the pediatric population and is non-toxin-producing. It involves blocking the absorption in the intestinal epithelium, thereby flattening villi and interfering with proper absorption.

Child with Watery Diarrhea

Child on Watery Toilet

Enteropathogenic E. coli (EPEC) is most common in the pediatric population and, due to its ability to flatten villi and block absorption, this leads to watery diarrhea. This diarrhea can involve up to 10-20 bowel movements per day, along with a possible fever and/or vomiting.

EHEC

Enterohemorrhagic E. coli (EHEC)

Hemorrhage-hammer and E-coal-eye

EHEC, or enterohemorrhagic E. coli, is toxin-producing, which can lead to bloody dysentery. EHEC is often associated with hamburgers, hemorrhage, and HUS.

Produces Shiga-like Toxin

She-Jello in Mirror

Enterohemorrhagic E. coli (EHEC) produces Shiga-like toxins (e.g., O157:H7) through gene integration, leading to inflammation and necrosis of the intestinal mucosa. This toxic effect then leads to watery/bloody diarrhea with mucus (i.e., dysentery).

Ingestion of Undercooked Meat

Ingestion of Raw/Undercooked Meat

Enterohemorrhagic E. coli (EHEC) is transmitted via the fecal-oral route. This transmission is often associated with contaminated foods, such as undercooked beef, milk, and raw vegetables.

Bloody Diarrhea

Red Toilet

Enterohemorrhagic E. Coli (EHEC) is toxin-producing and therefore leads to bloody diarrhea, abdominal cramping, and possible fever, though this is less common.

Hemolytic Uremic Syndrome (HUS)

Hemolysing U-rainbow Anemone

Enterohemorrhagic E. coli (EHEC) produces a Shiga-like toxin (e.g., O157:H7). With particular strains, this can lead to the complication of HUS, which is especially relevant to young children.