

UNDER THE MICROSCOPE: *CLOSTRIDIUM*

Clostridium: Gram positive, obligate anaerobe, found naturally in the soil, and in our colon.

1. ***Clostridium tetani*** –
 - causes tetanus (AKA lockjaw).
 - Newborn babies can contract the disease from a dirt-contaminated umbilical stump.
 - A neurotoxin binds to CNS neurons that normally inhibit muscle contraction. This results in rigidity and painful cramping.
 - Death occurs in about 10% of cases.
 - Good hygiene and a vaccine to the neurotoxin have virtually eliminated this disease from the U.S.
2. ***Clostridium botulinum*** –
 - causes food-poisoning.
 - Neurotoxin binds to neuromuscular junction and blocks muscle contraction.
 - Causes paralysis and may lead to respiratory arrest.
 - Endospores can survive in canned food and in raw honey; babies are most susceptible.
 - “Botox” is the injection of a small amount of the neurotoxin into the facial muscles to eliminate wrinkles (temporarily).
3. ***Clostridium perfringens*** –
 - causes gangrene and food-poisoning.
 - Exotoxins can dissolve collagen fibers and other connective tissue elements.
4. ***Clostridium difficile*** –
 - Causes diarrhea and pseudomembranous colitis (which can progress to toxic mega colon)
 - Overgrows in the colon during antibiotic treatment (because the endospores can survive the antibiotics and then germinate afterwards).
 - Persistent problem in nursing homes. Spreads easily between patients because endospores are very difficult to destroy.
 - Enterotoxin causes intestinal cells to lose water; cytotoxins directly damage intestinal cells.
 - Vancomycin may be given to treat *C. dif.*
 - Fecal transplant is a legitimate treatment option.