

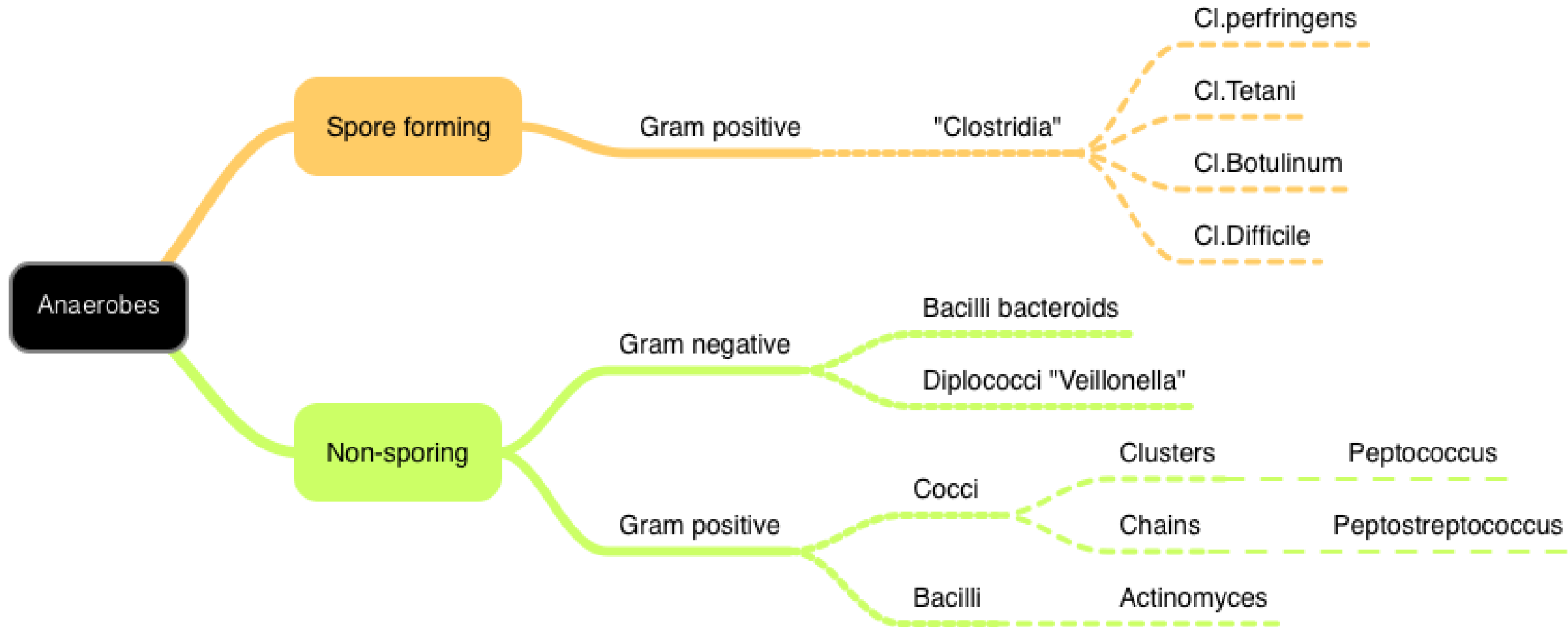
Lecture 11



Anaerobic Bacteria

- Additional Notes
- Important
- Explanation
- Examples

Classification of anaerobes:



Anaerobic Bacteria

- The broad classification of bacteria as anaerobic, aerobic, or facultative is based on the types of reactions they employ to generate energy for growth and other activities.
- Anaerobes cannot grow in the presence of oxygen.
- They lack an enzyme called superoxide dismutase, Therefore, they cannot convert H₂O₂.
- They contain flavoprotein so in the presence of oxygen they produce H₂O₂ which is toxic.

HABITAT I:

- Organism are normal flora in:

- ✓ Oropharynx
- ✓ Gastrointestinal tract (the most abundant) Found mainly in the large colon
- ✓ Female genital tract

- Laboratory diagnosis:

To have proper collection of the sample, pus (**aspirate**) is better than swabs. It is necessary to send the sample quickly to the lab for **culture**.

Incubation for anaerobic bacteria takes at least 2 days.

- Treatment:

- ✓ Penicillin is the most important treatment for most anaerobes.
- ✓ **HOWEVER**, Bacteroides fragilis is always resistant to penicillin. So, Treatment of these two is **metronidazole**.

FEATURES OF ANAEROBIC INFECTIONS:

Go through it only!!

- They are always near to the site of the body which is habitat.
- Infection from animal bites.
- Deep abscesses.
- The infections are also polymicrobial “presence of several species of microorganisms”.
- Gas formation, foul smell “Bad smell”.
- Detection of "Sulphur granules" due to actinomycosis.
- Failure to grow organism from pus if not culture anaerobically.
- Failure to respond to usual antibiotics.
- Infection begins when there is disruption of barriers e.g. trauma, operation or disruption of blood supply, e.g. tissue necrosis.
- Infection can occur everywhere, in any part of the body around the normal flora area. They can happen in the brain, sinuses, abdomen and genital area.

Bacteria	pathogenesis	treatment
Fusobacterium "Gram -ve"	- Jugular vein thrombosis - lead to lung embolism	
Actinomyces	- After <u>tooth extraction</u> the NF invade the soft tissue - It may cause <u>osteomyelitis</u>	
Cl. Perfringens	- <u>Gas gangrene</u> - Wound infection	Surgery - To prevent it, avoid dirt.
Cl. Tetani (powerful toxin)	Tetanus (muscle spasm) "inhibits inhibitory impulses from the brain" - (Lives in soil and animal feaces. and any <u>wound can infected if contaminated by spores</u>)	Antitoxin - To prevent it, avoid exposure to dirt and vaccination
Cl. Botulinuim (powerful toxin)	Botulism paralysis "inhibits the release of Acetylcholine" - "الهنود الحمر" It can cause by - Canned and sea food .	Antitoxin - To prevent it, autoclaving and heating of food
Peptostreptococcus	Brain abscess	
VEILLONELLA "Gram -ve"	<u>the only gram negative cocci.</u>	

Penicillin

Bacteria	pathogenesis	treatment
Bacteroides "Gram -ve"	<u>Most common anaerobic Bacteria</u>	Metronidazole (Resistant to penicillin)
Cl. Difficile ⁽¹⁾	Normal Flora + Antibiotics ↑ Cl. Difficile: A, enterotoxin (diarrhea) B, Cytotoxic (kill the cell)	Metronidazole (No penicillin)

⁽¹⁾Will cause pseudomembranous colitis. The patient will have a pseudo membrane in the GIT that is composed of "fibrin, bacteria, WBCs" which is actually not a real membrane but a necrotic tissue happened because of toxin B that is produced from the bacteria.

REMEMBER !

- Abscess is the main symptoms for all anaerobic.
- GIT is the most location for anaerobic infection.
- Penicillin is the drug for most anaerobic infection.

Quiz

1. Treatment of most anaerobic bacteria is:

- a) Penicillin b) Metronidazole c) Vancomycin

2. Anaerobic bacteria lack an enzyme called:

- a) Lactase b) Superoxide dismutase c) Lyase

3..... is the most location for anaerobic infection.

- a) Genital tract b) GIT c) Respiratory Tract

4. The broad classification of bacteria is based on the types of reactions they employ to generate energy for growth. a) T b) F