

# ANAEROBIC BACTERIA

## NOTES :

- ✚ 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”
- ✚ Abscess is the main symptoms for all anaerobic.
- ✚ GIT is the most location for anaerobic infection.
- ✚ Penicillin is the drug for most anaerobic infection.
- ✚ Penicillin is the most important treatment for most anaerobes.
- ✚ HOWEVER, *Bacteroides fragilis* is always resistant to penicillin. So, Treatment of these two is metronidazole.



عملنا هذه المحاضرة على اساس شرح دكتور الصميلي والاشياء اللي طلبها في المحاضرة ولكن هذه المحاضرة ليست مضمونة ١٠٠% لان لم تراجع مع الدكتور (لأنه مشغول اليومين) يوم الاحد راج ابلكم اذا هي مقبولة او اذا في تعديل او نقص .

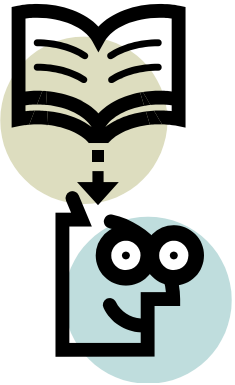
## LECTURE NINE

Color index

**\*Important**  
\*Further explanations

## Definition:

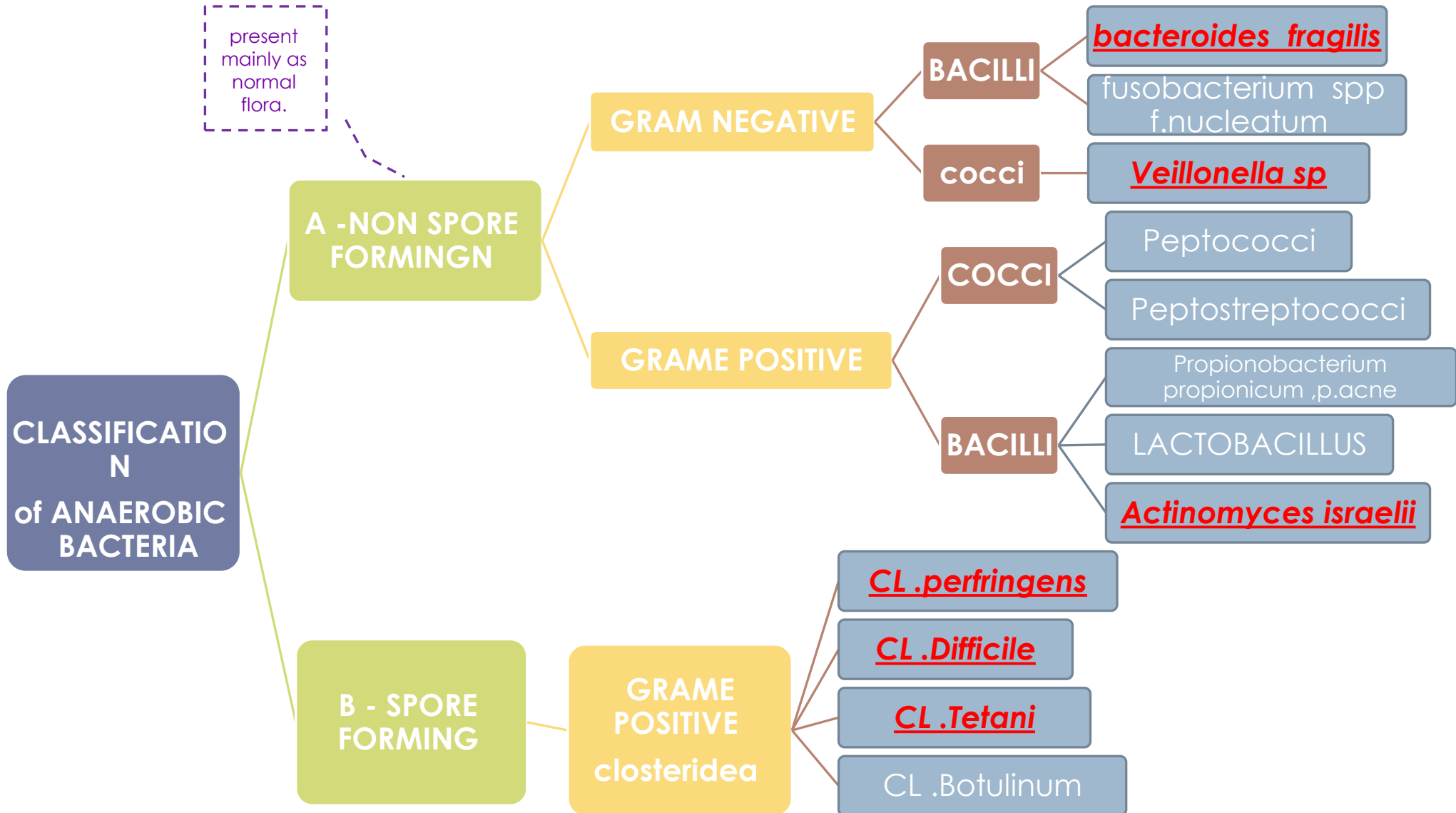
A Microbe THAT CAN ONLY GROW UNDER ANAEROBIC CONDITION  
SENSITIVE TO metronidazole MTZ  
FAIL TO GROW IN AIR 10 % O<sub>2</sub>



**Why can't anaerobic bacteria survive in oxygen?**

**They lack an enzyme called superoxide dismutase, Therefore, they cannot because convert H<sub>2</sub>O<sub>2</sub>.**

**NOTE THAT:** 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



## PRESENCE AS NORMAL FLORA IN

Skin

Nose

Mouth, throat

Stomach

**Large intestine  $>10^{11}$  /  
gram colonic contents**

Vagina / Urethra

Endocervix

## CHARACTER OF ANAEROBIC INFECTION

Suppuration

Abscess formation

Tissue destruction {gangrene}

Septic thrombophlebitis

Some have unique pathology  
Actinomycosis •  
Pseudomembranous colitis •  
Gas gangrene •

## PREDISPOSING FACTORS

Low O tension  
{Eh}

Trauma

Trauma, dead  
tissue, deep  
wound

Cholecystitis

Impaired  
blood supply

Obstruction

Presence of  
other  
organisms

Ulceration

Foreign  
bodies

Diabetes  
mellitus

Antibiotic  
therapy

Pylephlebitis

Neoplasm

Diverticula  
formation

### IMPORTANCE :

- Dominate the indigenous flora (colonization resistance)
- Commonly found in infection
- Easy to overlook
  - special precautions
  - Slow growth
  - Mixed infection
- Difficult treatment

## TETANUS STRICT TOXIGENIC DISEASE

### Source

- Animals feaces •  
{horses} ,soil
- Contaminated wound •  
{minor}
- Compound fracture •
- Narcotic addicts •
- Unsterile injections •
- Burns , bites ,avulsions •
- Umbilical stump •

### PATHOGENESIS

- EXTOXIN •  
{TETANOSPASMIN}
- Presynaptic terminals of •  
LMN Inhibitory impulses  
to MNs
- Persistent tonic spasm •

### Clinical picture

- Generalized •
- Localized •
- Cephalic •
- Neonatal{ •  
>90%}mortality
- IP 3-21 days •



## TETANUS STRICT TOXIGENIC DISEASE

### DIAGNOSIS

- Clinical •
- Laboratory •  
(minor role)

### TREATMENT

- Supportive •
  - Airway ○
  - Muscle relaxant ○
  - Wound care ○
- Antitoxin •
- Antibiotics :MTZ , PG •
- TIG {500 UNITS

### PREVENTION

- Complete active childhood immunization
- Appropriate wound management
- Type of wound
- Immunization history



ADAM

prevention  
is very  
important.

## GAS GANGRENE

### ETIOLOGY

*C. perfringens* { 80% }

- Toxin mediated breakdown of muscle tissue
- Rapid progression { Uterus }
- Liquefactive necrosis of muscle , gas formation , toxemia
- Fulminant septicemia
- Intravascular hemolysis
- Hemoglobinuria
- Blood cultures positive in 15 % of patients

### PATHOGENESIS

- 5--Toxins [ A – E ]
- **Phospholipase C { alpha toxin }**  
**the main toxin**
  - Acts on membranes of muscle cells , leukocytes and platelets .
  - Play major role in the pathogenesis of
  - *C. myonecrosis*
  - Has necrotizing activity
- Other toxins :- collagenase , proteinase , DNAs

### Clinical picture

- Acute progressive pain , edema , skin discoloration
- Systemic – fever , tachycardia , hypotension , renal failure , crepitus , pulmonary edema , death



## DIAGNOSIS

CLINICAL ■

SURGICAL ■

MICRO. ■

Gram stain :- G PB , absent leukocytes —

Culture { aerobic and anaerobic } —

Exudate , aspirates ■

Tissue ■

Blood ■

Nagler reaction —



Bacteria	pathogenesis	treatment
Fusobacterium "Gram -ve"	Jugular vein thrombosis - - lead to lung embolism	
Actinomyces	- After tooth extraction the NF invade the soft tissue - It may cause osteomyelitis	
Cl. Perfringens	- Gas gangrene - 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 wound can infected if contaminated by spores)	Antitoxin - To prevent it, avoid exposure to dirt and vaccination
Cl. Botulinuim (powerful toxin)	Botulism paralysis "inhibits the release of Acetylcholine" "- food . الهنود الحمر . It can cause by - Canned and sea "	Antitoxin - To prevent it, autoclaving and heating of food
Peptostreptococcus	Brain abscess	
VEILLONELLA "Gram -ve"	the only gram negative cocci.	

Penicillin

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

## MCQS

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



# THANK YOU

Remember that the happiest people are not those getting more, but those giving more.

H. Jackson Brown, Jr.

## Related videos:

<http://youtu.be/MKvNW60o-xQ>



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