

Gram-Positive Bacilli

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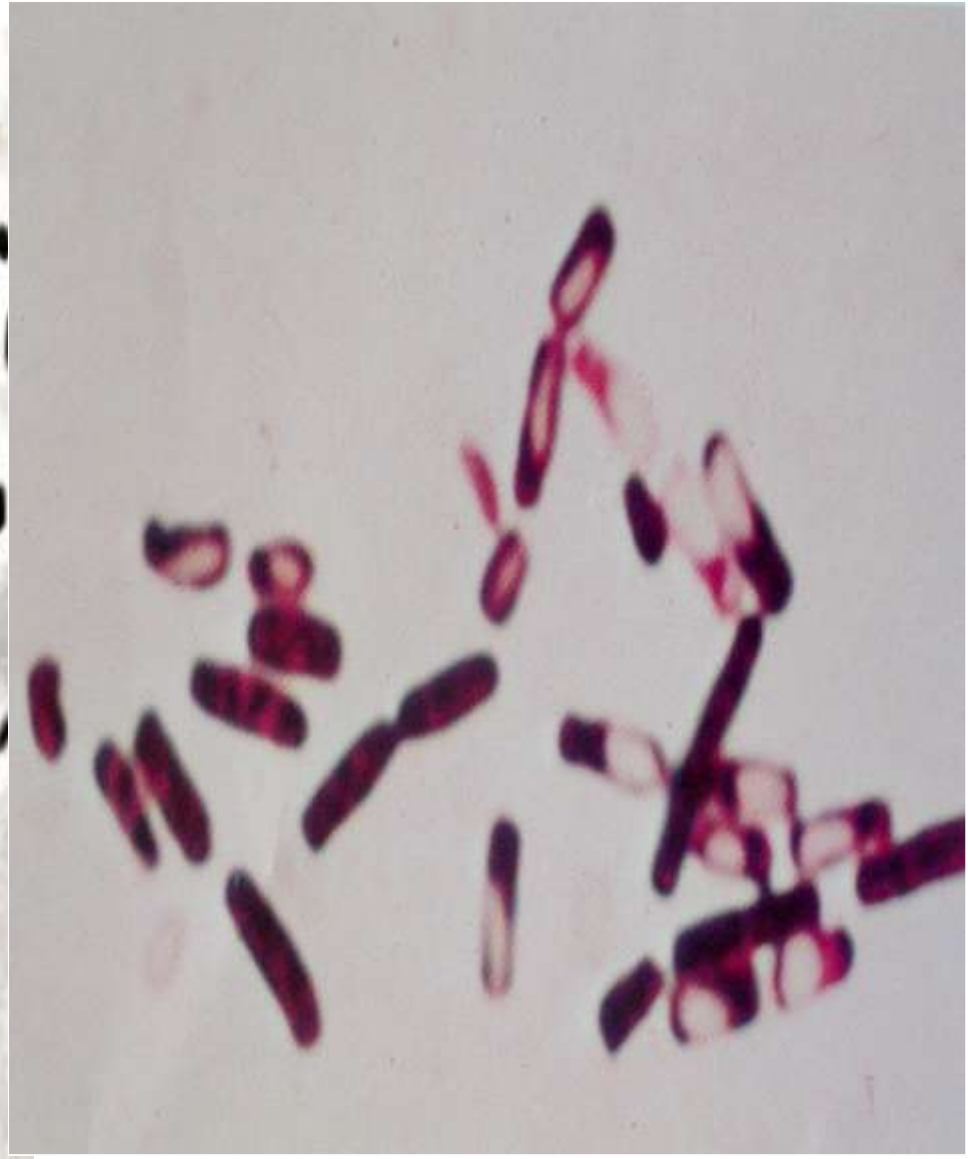
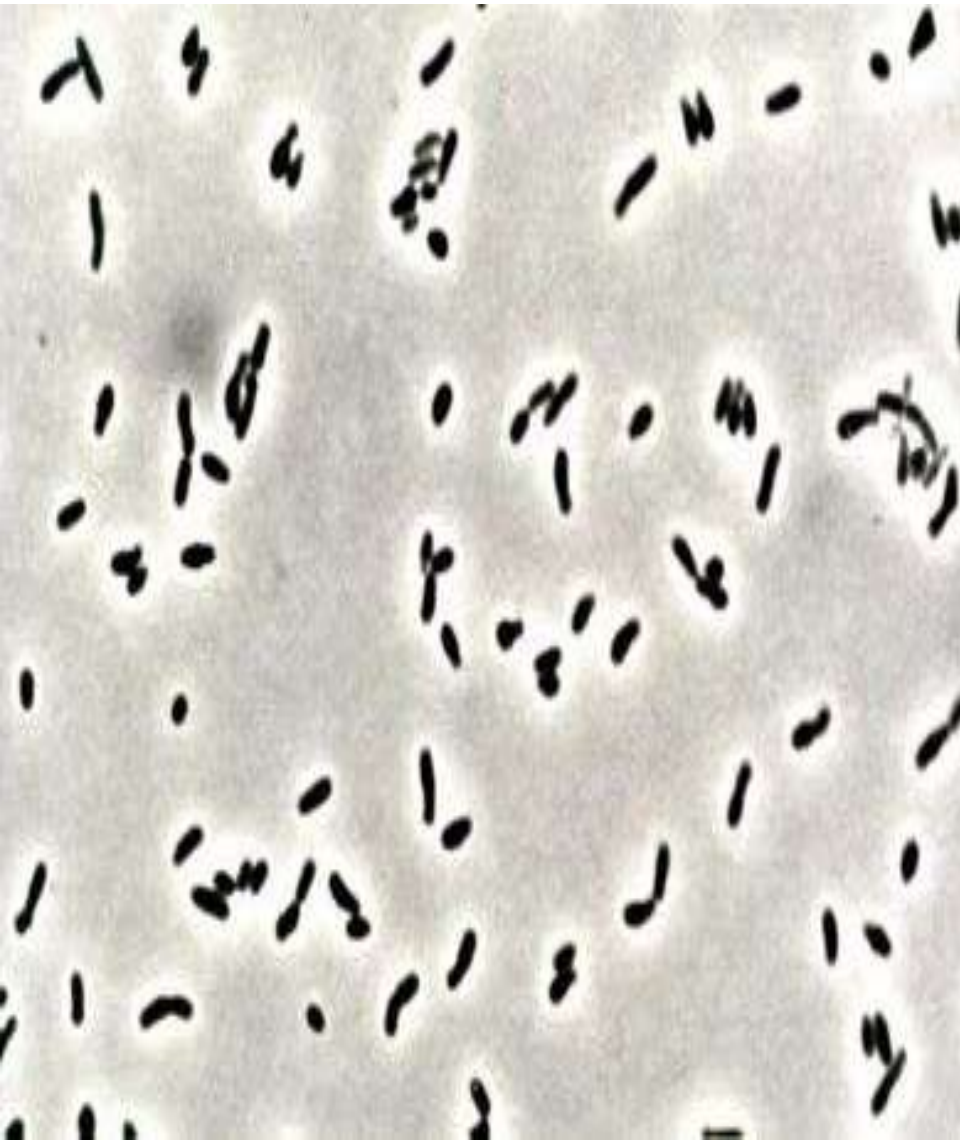
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Corynebacteria Group

- Gram-positive Pleomorphic Bacilli.. Diptheroides.. Aerobic, Normal Flora, Respiratory-Urinary tract, Skin.. Mostly Nonpathogenic.
- Corynebacterium diphtheriae: Highly infectious & Human Pathogenic.. Spread by Droplets Carriers/ Clinical cases.. Inflammation.. Throat-Pharynx-Larynx.. Diphtheria Toxin.. Necrosis Liver, heart. Toxin gene carried on bacteriophage.. Lysogenic strains.. High Fatality without antibiotics treatment.
- Prevention: Diphtheria Toxoid (Triple Vaccine, DTP) 2-4-6 Months Children .
- Lab Diagnosis: Albert's stain Direct Smear & Throat culture.. Tellurite Blood Medium.. Toxin test of *C.diphtheria* isolates.

Corynebacteria-Bacillus species



Spore Forming Bacilli

- **Gram+ve Spore-forming small/Large Bacilli ..**
Aerobic/Anaerobic.. Survive Long Period in Dryness.. Resist boiling temperature..Common in Nature.. Soil, Dust, Vegetations, Human /Animal Intestines, Feces & Water.. Mostly Saprophytes..Putrefaction of organic compounds.. Few Pathogenic bacteria species causing disease in humans/Animals. Rapid growth 24-48h
- **Aerobic Bacilli Group:**
- **Bacillus cereus**: Easily contaminated Food (Rice, Meat, Fish, Dairy products).. **Heat-stable Enterotoxin**.. Food-poisoning: Incubation Period.. 1-24 Hrs, Vomiting & Diarrhea, No Fever..No Need for Antibiotic..Very rare invasive infections.

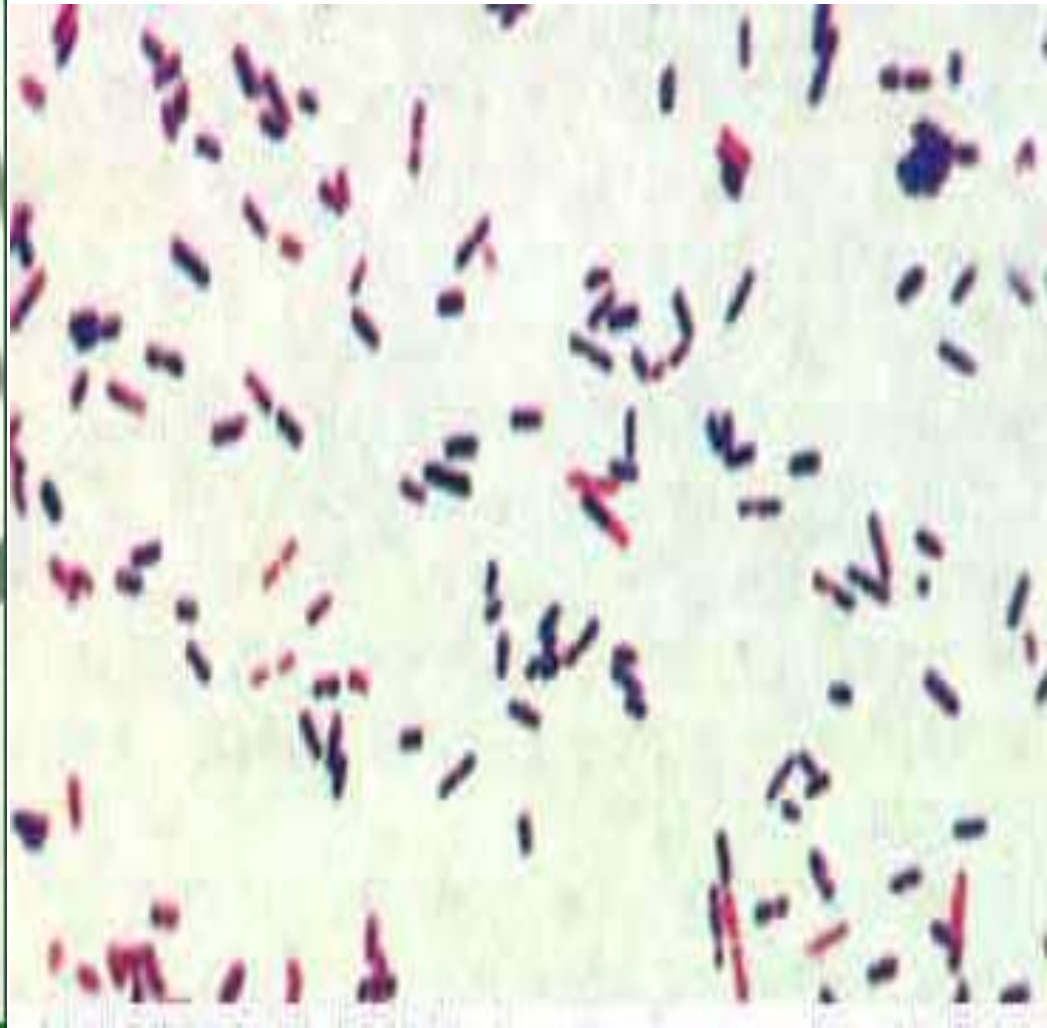
Aerobic Bacilli

- *B. subtilis*: Opportunistic Pathogen.. Wound infect ..Sepsis.. Infant.. Immunocompromised Patients.
- *B. anthracis*: Common cause of intestinal FATAL disease in animals.. Polypeptide Capsule.. Potent virulence factors.. Human Cutaneous Anthrax- chronic Lesions.. Surgery & antibiotics
- Inhalation *B. anthracis* spores causes **hemorrhagic Pneumonia & Septicemia**, High mortality..Biological War Agent.
- **Lab Diagnosis**: Culture Specimens.. Skin Ulcer.. Rare Blood / Sputum .. Culture on Blood & Chocolate Agar..

Clostridia-1

- **2- Anaerobic Clostridia Group**: Spore forming bacilli.. Exo-Enterotoxins.. Heat-Stable /Labile .. Exo-& Endogenous Infection.. High Fatality without Treatment.
- **Clostridium tetani**: Tetanus highly fatal disease .. Without treatment .. Localized infection/-Surface -Deep Tissue injury ..Release potent neurotoxin binds to the neurons CNS(**Tetanus toxin / tetanospasmin**), produced by vegetative cells grow in necrotic tissues under anaerobic conditions.
- ***Cl.tetani*** multiplies locally and symptoms appear remote from the infection site.. Toxin causes spasm in face& jaw ..Overall body muscle spasm ..Respiratory & heart failure..Rapid death
- **Treatment**: Surgical Debridement.. Antibiotics.. Tetanus Vaccine.
- **Lab Diagnosis**: Specimens from damaged Tissues.. Direct Gram-stain.. Culture on Tellurite-blood & chocolate agar

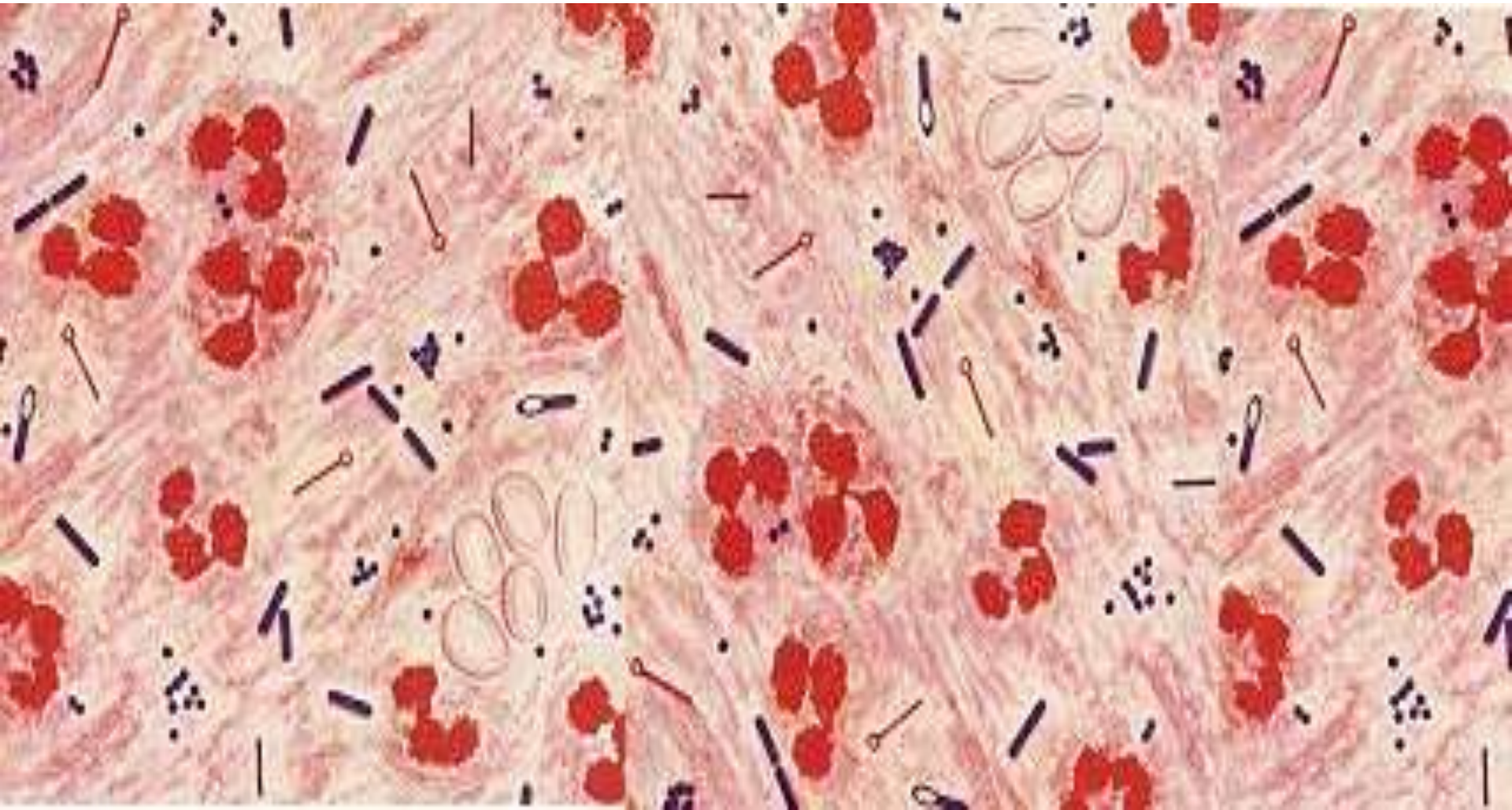
Clostridium tetani- *Cl.perfringens*



Clostridia-2

- **Clostridium perfringens & Others Species:** Toxigenic & Invasive .. Endo-Exo Infections.. Release Enzymes /virulence factors ..Collagenase, Hyaluronidase,Toxins .
- Infection due to contamination deep wounds..multiplication in damaged tissue causing Gasgangrene- Myonecrosis- Cellulitis. septicemia
- **Treatment: Surgical Debridement/ Amputation & Antibiotics**.. No Preventative Vaccine
- A common cause of Food-Poisoning.. food (meat) or intestine.. Enterotoxin . Incub 6-24 Hrs, Intense watery diarrhea abdominal cramps.. No Fever
- Lab Diagnosis: Culture Specimens, Aspirated Fluid Wound/Blood .. Gram-stain , PCR.

Wound Infection with Mixed Clostridia & Other Bacteria



Clostridia-3

- *C. botulinum* : Food-borne botulism is **intoxication** .. Ingestion of foods contain preformed toxin.. Heat-Stable Exotoxins..20min /100C.
- Contamination Canned Food.. Meat, Fish, Beans.
- Botulism: Clinical symptoms begin 8-36 hours after toxin ingestion with weakness, dizziness, dryness mouth, Nausea, Neurologic features.. blurred vision, inability to swallow, difficulty in speech, weakness of skeletal muscles and Respiratory Paralysis.. Inhibition the release of the neurotransmitter acetylcholine.. No Fever..Now rare cases.
- Diagnosis & treatment: Clinical Features.. Difficult to detect toxin..antitoxin serum..support therapy.

Clostridia-4

- *Clostridium difficile*: Human intestines..Healthy Carriers .. Endo.. Common Nosocomial Infection..Antibiotic usage
- Produces two toxins: Toxin A is enterotoxin .. causes fluid accumulation in the Intestinesl. Toxin B is an extremely lethal (cytopathic) toxin.
- Pseudomembranous Colitis.. Bloody Diarrhea.. AntibioticAssociated diarrhea (Amoxicillin, Lincomycin-Clindymicin, Cephalosporines) .. Long Treatment.. Fatal.. Treatment: Stop used Antibiotics..replace by Metronidazole or vancomycin
- Lab Diagnosis: Identification of Toxins in Stool Specimen by immunological test.. Less Culture