MORPHOLOGY AND GENERAL INFORMATION OF SELECT MICROORGANISMS

Acinetobacter

*Gram Stain* - Gram-negative paired coccobacilli, aerobic part of the normal body flora may cause opportunistic infections. opportunistic pathogen associated with sepsis and pneumonia.

Bacteroids

*Gram stain* - anaerobic Gram-negative rod-shaped found in oropharynx, large part of the normal fecal flora the most frequently isolated and most clinically significant anaerobic bacterium.

1. **Bacteroids Fragilis** - most virulent of Bacteroids species the ability to produce destructive extracellular enzymes and potent beta-lactamases

Citrobacter

*Gram stain* - Gram-negative rod-shaped, associated with extraintestinal infections often hospital - acquired

1. **Citrobacter Freundii** - most commonly seen antibiotic- resistant species associated with urinary tract infections, wound infections, pneumonia, bacteremia, meningitis

Clostridium

*Gram stain* - anaerobic, large, Gram-positive rod-shaped bacilli, part of the normal intestinal flora of humans many species decompose protein and/or form toxins associated with gas gangrene, wound infections pathogenic species producing destructive exotoxins or enzymes

1. **Clostridium Difficile** - the cause of antibiotic-induced
pseudomembranous enterocolitis, also associated with many cases of antibiotic-induced diarrhea

**Enterobacter**

*Gram stain* - Gram-negative rod-shaped, present in the intestinal tract, most infections hospital-acquired (nosocomial)

1. **Enterobacter Aerogenes** - causes urinary tract infections, pneumonia, surgical wound infections, bacteremia, endocarditis and meningitis.

2. **Enterobacter Cloacae** - causes urinary tract infections, wound infections, pneumonia, bacteremia and meningitis.

**Escherichia**

*Gram stain*, Gram-negative rod-shaped, present in the intestinal tract, organism nonpathogenic or opportunistic

1. **Escherichia Coli** - part of the normal intestinal flora frequent cause of urinary tract and gastrointestinal infections, cholecystitis, peritonitis, wound infections, pneumonia, bacteremia, endocarditis, meningitis, gastroenteritis.

**Haemophilus**

*Gram stain* - Gram-negative rod-shaped (looks like coccobaccillis) part of the normal flora of the upper respiratory tract mucous membranes more common in children than adults causes sinusitis, otitis media, conjunctivitis, acute epiglottitis, bronchitis, pneumonia, bacteremia, meningitis.

1. **Haemophilus Influenzae** - part of the normal respiratory
flora, causes cellulites, sinusitis, otitis media, bronchiltis, conjunctivitis, endocarditis, empyema, pericarditis

Klebsiella

*Gram stain*- Gram-negative rod-shaped part of the normal gastrointestinal flora

1. **Klebsiella pneumoniae** - part of the normal flora of the gastrointestinal tract
   a colonizer of the upper respiratory tract
   cause of pneumonia, lung abscess, sinusitis, endocarditis, sepsis, meningitis, peritonitis, liver and biliary tract disease, wound infections, uterine and vaginal infections, osteomyelitis and skin and urinary tract infections.
   alcoholics and cirrhotic susceptible to respirtatory infections by this organism

Legionella

*Gram stain* - aerobic, Gram-negative bacilli

1. **Legionella Pneumophila** - cause of pneumonia, febrile respiratory illness
   (Legionnaires' disease)

Morganella Morganii

*Gram stain*- Gram-negative rod-shaped gastrointestinal infections, wound infections, pneumonia, bacteremia, meningitis.

Proteus

*Gram stain*- Gram-negative rod-shaped part of the normal fecal flora
causes urinary tract infections, pneumonia, wound infections, bacteremia, meningitis
1. **Proteus Mirabilis** - most frequently isolated from human sources, isolated from urine, sputum, wounds, intra-abdominal abscesses, blood and CSF

**Pseudomonas aeruginosa**

*Gram stain* - Gram-negative rod-shaped
seen mainly in debilitated individuals, those with neoplasms, severe burns, immunosuppression or on prolonged antimicrobial therapy
frequently present as part of the normal intestinal and skin flora
infects wounds, cause urinary tract infections, necrotizing pneumonia, empyema, eye infections, sepsis, endocarditis and meningitis
can contaminate burns, draining wounds, sinuses and decubitus ulcers
infections more inclined to develop in patients receiving antibiotics

**Salmonella**

*Gram stain* - Gram-negative rod-shaped
contracted orally by ingestion cause of gastrointestinal disease wide range of symptoms from mild enteritis to rapidly fatal sepsis

**Serratia**

*Gram stain* - gram-negative rod-shaped
most clinical isolates represent hospital-acquired infections

**Staphylococcus**

*Gram stain* - Gram-positive cocci (clusters)
most species considered to be part of the normal flora of the skin, mucous membrane and respiratory and gastrointestinal tracts

1. **Staphylococcus Aureus** - coagulase-positive
hospital acquired strains are often resistant to multiple antibiotics in recent years (MRSA)
also cause of toxic shock syndrome by producing a systemically absorbed toxin, characteristic by fever, sun-burn-like rash and occasionally severe hypotension produces abscesses, impetigo, wound
infections, pyelitis, cystitis, pneumonia, empyema, osteomyelitis, arthritis, sepsis, brain abscess, bacteremia, endocarditis, meningitis and suppuration in almost any organ

1. **Staphylococcus Epidermidis** - most commonly isolated coagulase-negative species
   - less virulent than Staph Aureus, often a contaminant
   - producing insidious but potentially very serious infections
   - such as bacteremia, endocarditis, meningitis, infections of catheters and various prosthetic devices

**Streptococcus**

*Gram stain* - Gram-positive cocci (in chains)
- in the GI tract
- capable of producing disease in almost every organ
- there are several classifications of this genus

1. **Lancefield's**
   - Group A Streptococci - primarily streptococcus pyogenes
     - Beta-hemolytic streptococcus
     - causes erysipelas, scarlet fever, acute glomerulonephritis, rheumatic fever, suppurative infections of the ear, throat, mastoids, tonsils, petontsillar abscess, cellulites, impetigo, lymphadenitis, pneumonia, sepsis, endocarditis, meningitis, necrotizing faceitis

   - Group B Streptococci - Beta-hemolytic streptococcus

   - Group C Streptococci - Beta-hemolytic streptococcus

   - Group D Streptococci - contains both hemolytic and non hemolytic types.
     - GI tract
     - prominent cause of bacteremia, bacterial endocarditis, urinary
tract and wound infections, pneumonia among the most highly antibiotic-resistant streptococci

Includes Enterococci
1. *Streptococci fecalis*
2. *Streptococci faecium*
3. *Streptococci durans*
4. *Streptococci avium*

Nonenterococci
1. *Streptococci bovis*
2. *Streptococci equines*