

Gram (+) Organisms

| | | |
|--------------|----------------|--|
| Cocci | Aerobic | → Staph. aureus |
| | (Cluster) | → Staph. epidermidis → Staph. saprophyticus |
| | Aerobic | → Strep. pneumoniae |
| (Pair/Chain) | | → Strep. pyogenes (Grp A) |
| | | → Strep. agalactiae (Grp B) |
| | | → Viridans streptococci |
| | | → Enterococcus faecium |
| | | → Enterococcus faecalis |

| | |
|------------------|----------------------|
| Anaerobic | → Peptococcus |
| | → Peptostreptococcus |

| | | |
|----------------|----------------|--|
| Bacilli | Aerobic | → Corynebacterium |
| | | → Listeria (facultative aerobic & anaerobic) |
| | | → Lactobacillus |
| | | → Gardnerella |
| | | → Bacillus |

| | |
|------------------|---------------------|
| Anaerobic | → Clostridium |
| | → Lactobacillus |
| | → Actinomyces |
| | → Propionibacterium |

Gram-positive bacteria, identifiable by their thick cell walls staining purple, are targeted by antibiotics like penicillin, glycopeptides (e.g., vancomycin), and lipopeptides (e.g., daptomycin) that disrupt cell wall synthesis or membrane integrity, depending on the bacterium's resistance and infection site.

Pneumonia (PNA): Pathogens

| | |
|-------------------------------------|----------------------------|
| Community-acquired PNA (CAP) | (+) Strep. pneumoniae |
| | (-) Haemophilus influenzae |
| | (-) Moraxella catarrhalis |
| | (A) Mycoplasma pneumoniae |
| | (A) Legionella species |
| | (A) Chlamydia pneumoniae |

Pneumonia (PNA): Pathogens (cont)

| | |
|--------------------------------------|-------------------------------|
| Hospital-acquired PNA (HAP) | (+) MRSA |
| Ventilator-acquired PNA (VAP) | (-) Pseudomonas aeruginosa |
| | (-) Acinetobacter species |
| | (-) Enterobacteriaceae family |

| | |
|-------------------|-------------------------------|
| Aspiration | (-) Enterobacteriaceae family |
| | (+/-) Anaerobic organisms |

Pneumonia (PNA) is the infectious disease of the Lower Respiratory Tract. The 3 main routes of inoculation are inhaled, bloodstream, and aspiration.

Skin & Soft Tissue Infections (SSTI)

| | | |
|-------------------|---|---|
| Cellulitis | Folliculitis | |
| | Furuncles, Carbuncles, Abscesses | S. aureus is the most common cause |
| | Diffuse cellulitis (Erysipelas) | Group A Strep (GAS; S. pyogenes) is the most common cause |
| | Impetigo | Strep pyogenes -or- S. aureus are the most common cause |

| | |
|--------------------------|--|
| Necrotizing SSTIs | Streptococcus pyogenes (GAS) |
| | Mixed infection (Gram +/- and anaerobes) |
| | Clostridium species |

| | | |
|---------------------------------|--|---|
| Diabetic Foot Infections | Begin as skin ulceration, can spread into deeper tissue and bone | S. aureus Strep species Enterobacteriaceae Anaerobes |
|---------------------------------|--|---|

| | | |
|---------------------------------|---------------------------|--------------------------------|
| Surgical Site Infections | (Develop >48 hrs post-op) | Staph. aureus Strep species |
|---------------------------------|---------------------------|--------------------------------|

| | | |
|---------------------------|--------------------------|----------------------------|
| Immuno-compromised | HIV, hematology/oncology | Common or unusual bacteria |
|---------------------------|--------------------------|----------------------------|

Gram (-) Organisms

| | | |
|------------------|------------------|----------------------------|
| Bacilli | Anaerobic | → Bacteroides |
| | | → Prevotella |
| | | → Fusobacterium |
| | Aerobic | Enterobacteriaceae: |
| (Fermenters) | | → Proteus |
| | | → E. coli |
| | | → Klebsiella |
| | | → Enterobacter |
| | | → Serratia |
| | | → Salmonella |
| | | → Shigella |
| | | → Citrobacter |
| | | Other (Vibrio/Aeromonas) |
| | Aerobic | → Pseudomonas |
| (Non-fermenters) | | → Acinetobacter |
| | | → Stenotrophomonas |
| | | → Burkholderia |
| | Aerobic | → Haemophilus influenzae |
| (Fastidium) | | → Helicobacter pylori |
| | | → Campylobacter |
| | | → Bartonella |
| | | → HACEK group |

| | |
|--------------|-------------|
| Cocci | → Neisseria |
| | → Moraxella |

Gram-negative bacteria have thin cell walls with an outer membrane, staining red in the Gram stain process. They are treated with antibiotics such as aminoglycosides, cephalosporins, and fluoroquinolones, which target protein synthesis, cell wall synthesis, and DNA replication, respectively, adapting to their unique outer membrane and resistance mechanisms.

Urinary Tract Infections: Pathogens

| | |
|---------------------------|--|
| Uncomplicated UTIs | (-) PEK (E. coli, Klebsiella pneumoniae, Proteus) |
| | (+) Enterococci |
| | (+) Staph. saprophyticus |
| Complicated UTIs | The above pathogens + MDR pathogens in those with frequent UTIs and nosocomial UTIs (S. aureus, Pseudomonas) |

Urinary Tract Infections can be acquired via **Ascending** (urethral colonization with fecal flora) or **Descending** (bloodstream → kidneys).

Uncomplicated is defined as UTI in young, otherwise healthy females.

Complicated is defined as everyone else (e.g. Pyelonephritis, Prostatitis, Catheter/Nosocomial related UTIs, and Renal stones)

