Mycobacterium tuberculosis:

- Primary and post primary infection
- Primary
  - bacteria settle into lungs and grow
  - in low resistance individuals, acute pulmonary infection, destruction of lung tissue, spread of infection and death.

Mycobacterium leprae (Leprosy)

- can cause folded, bulblike lesions, especially on the face
- poor prognoses for multibacillary form

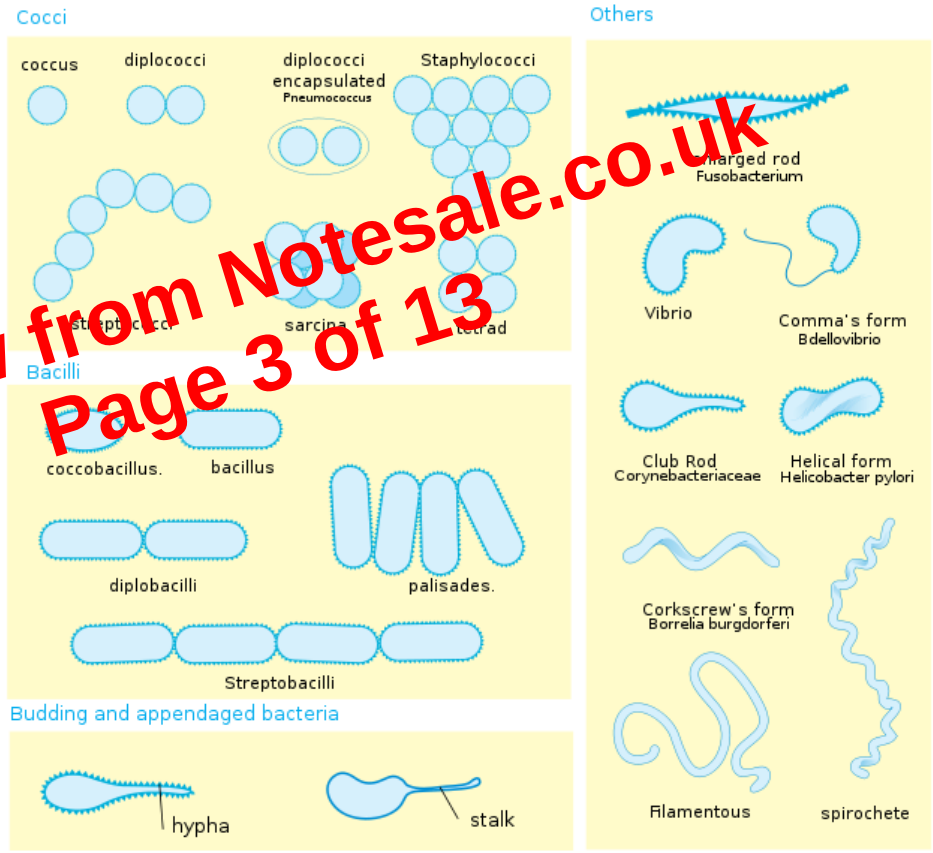
IMPORTANT

- **Gram-positive organisms can cause a wide range of infections of varying severity**
- **Infections include:**
  - **Tuberculosis**
  - **MRSA**
  - **Leprosy**
  - **Pneumonia**
  - **Scarlet fever**

Morphology:
This is the study of form in bacteria

This includes:

- Shape
- Size
- Cell structure
- Motility
- Spore formation
- Capsule formation
- Toxin production



Gram-negative Bacteria:

Salmonella:

- Salmonella causes salmonellisis which causes vomiting and diarrhoea
- Found in the GI tract of birds and animals
- Rod shaped bacteria, non-spore forming!
- Predominantly motile Enterobacteriaceae
- Have a flagella which grades in all directions
- Many infections are due to the ingestion of contaminated food
- Can be passed from non-human to human (zoonotic)

- Skin
- Oral cavity
- Respiratory tract
- Intestinal tract
- Urogenital tract

Skin:
- Most organisms are associated with the sweat glands
- Most gram-negative bacteria continuously inoculate skin, cant multiply and usually die
- Most gram-positive bacteria (staphylococci) are anaerobic and aerobic

Oral cavity:
- Colonisation:
  - Streptococcus sanguis
  - Streptococcus sobrinus
  - Streptococcus mutents
  - Streptococcus mitis
- Dental caries (tooth decay) occurs when plaque accumulates and acid products form. Micro-organisms penetrate the matrix.

Respiratory tract:
- Trachea, bronchi and lungs are usually sterile
- Organisms settle on walls of passages
- Usually streptococci

Urogenital tract:
- Escherichia coli
- Acidophilus (vaginal infection)

<u>Disinfection and sterilisation:</u>

- Sterilisation – the complete elimination or destruction of all forms of microbial life
- Disinfection – a process that eliminates many or all pathogenic microorganisms on inanimate objects, except bacterial endospores.

Factors affecting microbial killing:
- Population size – a large population takes longer to kill than a smaller one
- Population composition – microbes can vary in susceptibility
- Concentration of anti-bacterial agent – the more concentrated, the more effective
- Duration of exposure – the longer the population is exposed to an agent, the more effective
- Temperature – most chemicals kill more effectively at a raised temperature
- Environment – presence of organic matter can protect the effects of agents

Physical methods:
- Heat – dry/moist heat
- Autoclave – moist heat sterilisation 100^{o}C+
- Dry heat – kills by oxidation
- Pasteurisation – doesn't sterilise but kills most pathogens
- Filtration – depth filters (thick layers of granular or fibrous materials) or mem. Filters
- Radiation – kills by disrupting nucleic acid replication

Chemical methods:
- Phenolics – non-sterile, kill by protein denaturation
- Alcohols – kill by denaturing proteins
- Halogens – Chlorine/iodine, oxidises cell constituents