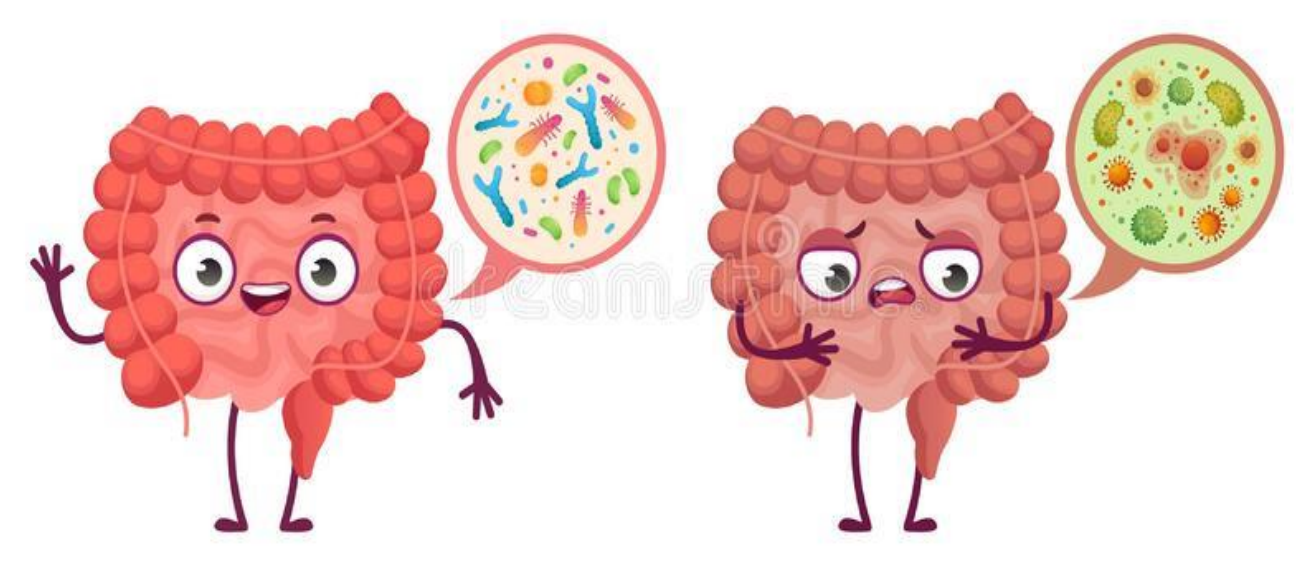
Normal Body Flora



Dr. Shuaibu Abdullahi Hudu, ***MBBS (Nig), PhD (Malaysia)***
Faculty of Dentistry,
Zarqa University, Jordan

INTENDED LEARNING OUTCOMES

- Define Normal flora
- Know the Normal Flora of the Oral Cavity
- Understand the Beneficial Functions of Normal Flora
- Know the Harmful Effect of Normal Flora

What are Normal Flora?

These are mixture of micro-organisms regularly found at any anatomical site on or within the body of a healthy person

→skin

- Under normal conditions in a healthy human they are harmless and may even be beneficial
- Also called **Commensals, Microbiota, Microflora, Probiotics** example: yougurt

Types of normal flora

- 1- Resident Flora
- Regularly found and fixed in a given area at a given age
  - if regular flora remain in this area it will not cause disease.
- May disturbed e.g. by hand washing, (antiseptic)
- They can reestablished by themselves.
- 2- Transient Flora
- Are derived from the environment contaminating the site.
- They may remain for hours or days
- They can be readily removed e.g. by hand washing. (Normal)
  - if transient flora get access to the inside of the body, it will cause disease.

Why Should We Know About Normal Flora?

- It gives us better understanding of the possible pathogenic organism that cause infection in a specific body site and are so called potential or opportunistic pathogens.

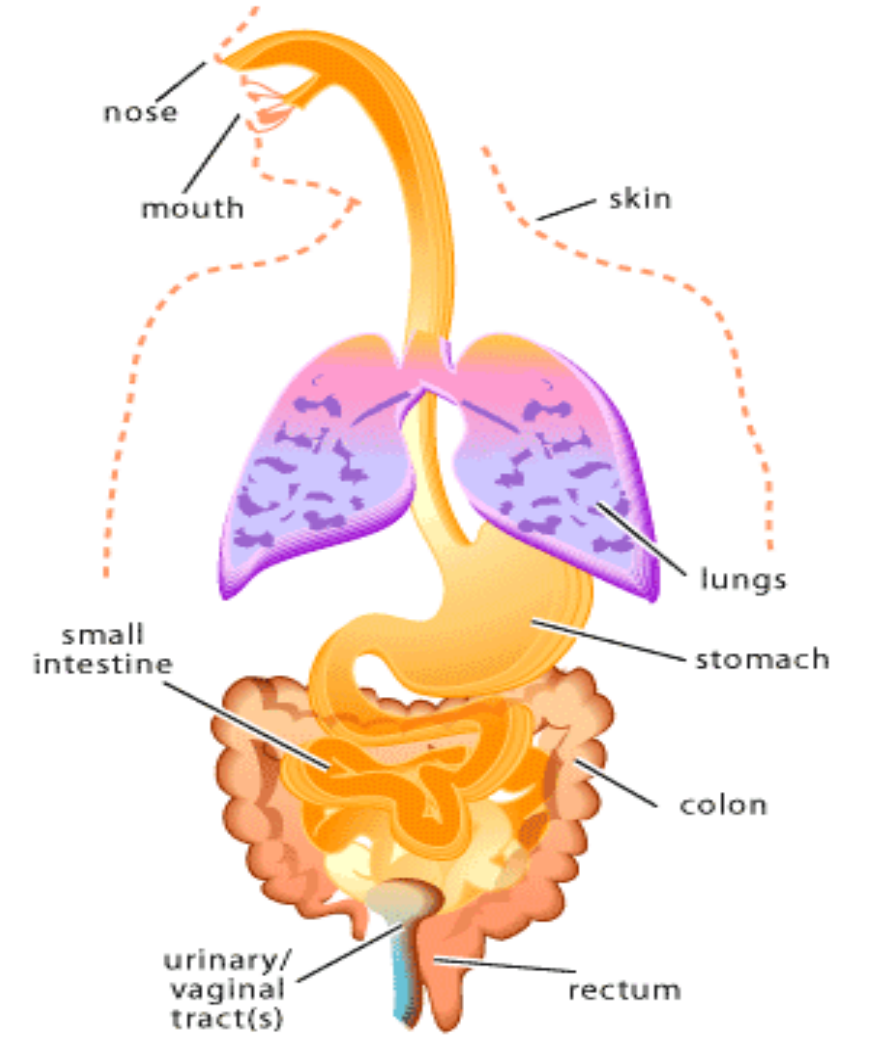
When given the oppurunity, e.g: reduced immune system, they will cause infection (like HIV)

- Disturbance in human microbiota may be associated by certain diseases as irritable bowel syndrome → due to reduction in normal flora

Where Can We find Normal Flora?

Resident normal flora are found in the following sites:

1. **Skin**
2. **Eyes and Ears**
3. **Oral Cavity (Mouth)**
4. **Respiratory Tract**
5. **Gastrointestinal Tract**
6. **Urogenital Tract**



Oral Cavity (Mouth)

- They have both aerobic and anaerobic bacteria, yeasts, protozoa, and viruses can be living in the **Mouth, Teeth and Gingiva**
- Poor dental hygiene help bacteria to grow and cause dental caries, gingivitis
- After dental surgeries, there might be a risk of bloodstream infection that might cause endocarditis

→ normal flora of the mouth gained access to the blood.

→ To prevent that we give prophylactic antibiotic to reduce oral normal flora & possibility of it reaching the blood & causing infection.

↓ infection of the inner layer of heart tissue

Oral Cavity (Mouth)

The organisms in the oral environment interact with each other by:

- ✓ Competing for receptor sites by prior occupation or colonization → Preventing Pathogenic bacteria from causing infection
- ✓ Production of **bacteriocin** → Antibiotic produced by bacteria that is lethal closely related species e.g. Enocin produced by Strept. Salivarius inhibits Strept. Pyogenes.
- ✓ Production of metabolic end products that lower the pH.

→ Normal flora of mouth

Acquisition of the Normal Oral Flora

- The infant's mouth is sterile at birth
- Few hours later, microorganisms are established in the mouth. acquired from the birth canal, mother's breast and the environment
  - → from amniotic fluid
- 4. If all teeth are lost, as a result of senility, bacteria at this stage are very similar to those in a child before teeth eruption. because bacteria require a surface to attach to
- 5. The introduction of a prosthetic application changes the microbial composition once again

Normal Flora of the Oral Cavity

Bacteria acquired from the birth canal: Seen in a child that hasn't grown teeth.

- ✓ Strept. Salivarius.
- ✓ Staphyloceccus.
- ✓ Commensal neisseriae.
- ✓ Diphtheroids
- ✓ Lactobacilli. Seen in both children & adults

Normal Flora of the Oral Cavity

Oral bacteria During and after tooth eruption:

- Organisms that prefer hard tissue surface of enamel are:
  - ✓ Strept. mutans,
  - ✓ Strept. Sangius
  - ✓ Lactobacilli.

Beneficial Functions of Normal Flora

1. The normal flora prevent colonization by pathogens by *competing* for attachment sites or for essential nutrients

- This important beneficial effect, which has been demonstrated in the *oral cavity, the intestine, the skin, and the vaginal epithelium*

Beneficial Functions of Normal Flora

2. The normal flora may antagonize other bacteria through the production of substances which inhibit or kill non-indigenous species.

Intestinal bacteria produce a variety of substances like non-specific fatty acids, peroxides and highly specific ***bacteriocins,*** which inhibit or kill other bacteria.

Beneficial Functions of Normal Flora

3. The normal flora stimulates the production of *"cross-reactive antibodies"*

- Since the normal flora behave as antigens in an animal, they induce an Ab mediated immune response

Beneficial Functions of Normal Flora

4. The normal flora ***synthesize and excrete vitamins*** in excess of their own needs, which can be absorbed as nutrients by the host.

For example, *enteric bacteria* secrete **Vitamin K and Vitamin B12**, and *lactic acid bacteria* produce certain B-vitamins.

Harmful Effect of Normal Flora

a. Normal flora cause infection in:

1. When the normal flora are displaced from their normal site (Habitat) of the body **e.g.** bloodstream infections by *S. epidermidis*.
2. When potential pathogens gain a competitive advantage due to diminished populations of harmless competitors **e.g.** *C. difficile* growing in the gut after antibiotic therapy.

Harmful Effect of Normal Flora

3. When individuals are immunocompromised, normal flora can overgrow and become pathogenic

None communicable, No microorganisms are found.

b. May cause non infectious disease:

1. When harmless, commonly ingested food substances are converted into carcinogenic derivatives by bacteria in the colon **e.g.** artificial sweetener.

Causes cancer

aspartate → carcinogenic sweetener

2. Disturbance in human microbiota may be associated by certain diseases as irritable bowel syndrome

THANK YOU