

# **Medical Bacteriology- Lecture- 2**

## **Normal Flora**

# The Normal Flora of Humans ( Human Microbiota)

**Definition:** The mixture of population of microorganisms found on or within body of healthy individuals

**Normal flora of humans consists of**

many bacteria  
few fungi

Viruses and Parasites



**not Normal Flora**

• In healthy human, there are many of bacteria are consistently associated with the body:

- **1) Body surfaces**
- **2) Mucus membranes**
- (skin and mucous membranes, are always contact with environmental organisms and become colonized by various bacterial species)
- **3) Intestinal linings of humans**

# The Normal Flora of Humans ( Human Microbiota)

- **Normal Flora absent in.....**
- **Sterile Tissues ( internal tissues)**
- **Blood**
- **Brain**
- **Muscles**

# The Normal Flora of Humans ( Human Microbiota)

*What is the Importance of Normal Flora?*

# The Normal Flora of Humans ( Human Microbiota)

- **Factors influencing Normal Flora ...**
  - **Age**
  - **Sex**
  - **Stress**
  - **nutrition and diet of the individual**
  - **Health condition**
  - **Antibiotics.**

# The Normal Flora of Humans ( Human Microbiota)

- Normal Flora of the Skin
- Non-pathogen: *S. epidermidis*
- Sometimes pathogenic *S. aureus* found on the hands.



# The Normal Flora of Humans ( Human Microbiota)

- Normal Flora of the Conjunctiva ( eyes)
- **Small** numbers
- ***S. epidermidis*** (predominant)
- Silver nitrate or an antibiotic may be put into the newborn's eyes to avoid infection ( *Candida sp.* , *Niesseria sp.*) after passage through the birth canal.

# The Normal Flora of Humans ( Human Microbiota)

- Normal Flora of the Respiratory Tract
  - - Upper Respiratory Tract
    - **Large** numbers
    - Predominantly with *S. epidermidis*, *Corynebacteria*, and *S. aureus*.
    - **Sinuses** : sterile in healthy person.
    - **Throat**: colonized by streptococci and gram-negative cocci.
      - pathogens : *Stre. pneumoniae*, *Strep. pyogenes*, *H. influenzae*
    - **Nose**: heavily colonized with coagulase negative staphylococci and *S. aureus*
  - Lower respiratory tract (trachea, bronchi)
    - Virtually **free of bacteria**
    - The pathogens such as *H. influenzae* or *S. pneumoniae*.
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# The Normal Flora of Humans ( Human Microbiota)

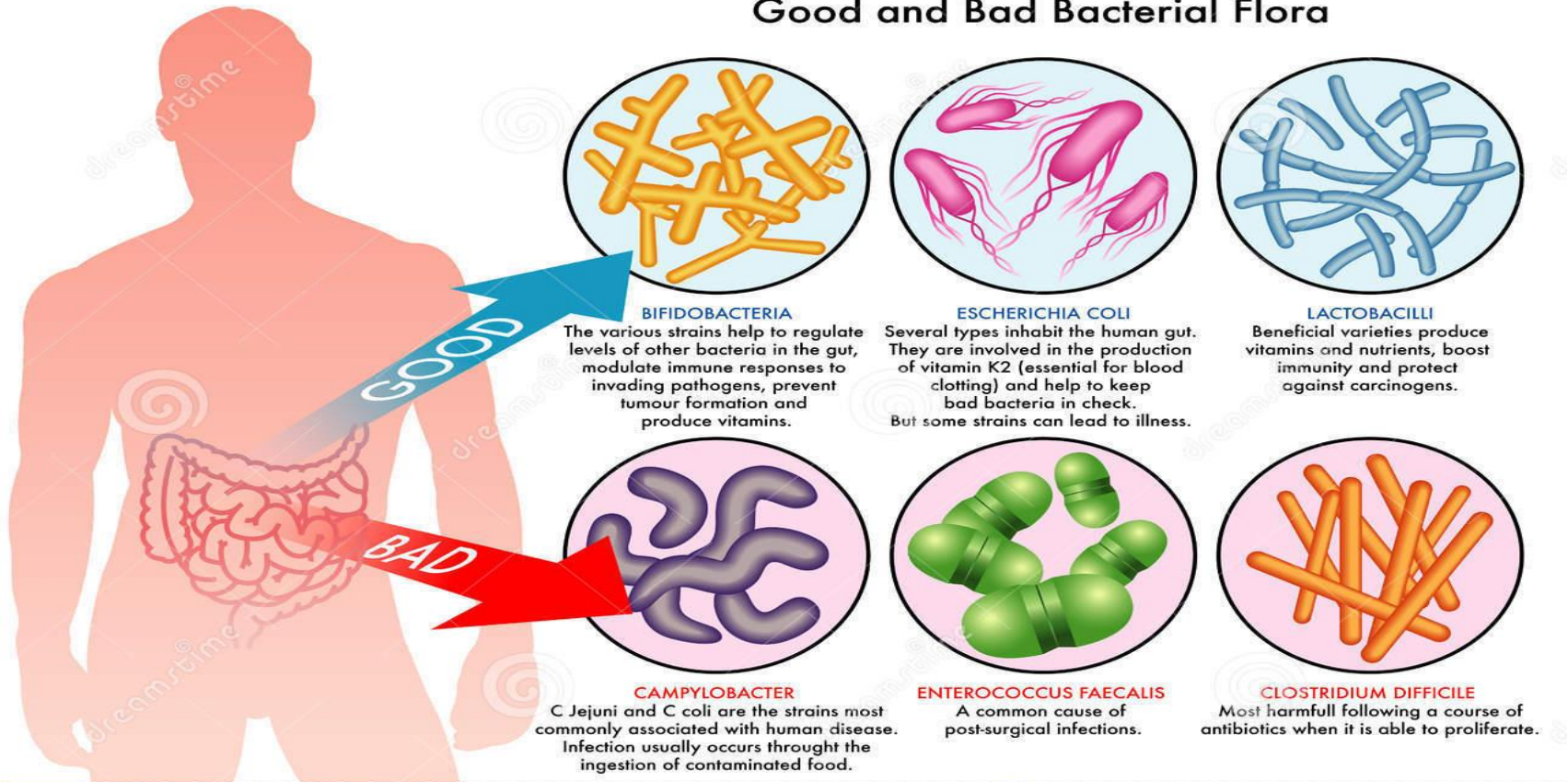
- Normal Flora of the Oral Cavity
- **The mouth** is a favorable habitat for variety of bacteria.
- **Oral bacteria include streptococci, Lactobacilli, Staphylococci , anaerobes such as Bacteroids.**
- ***Strep. mutans*** colonize teeth ( can causes dental caries)

# The Normal Flora of Humans ( Human Microbiota)

- Normal Flora of the Gastrointestinal Tract
- **Different** (age, diet, and the use of antibiotics).
- **Stomach** : because the high acidity of gastric juice; very few bacteria (mainly acid-tolerant lactobacilli).
- *Helicobacter pylori* is a pathogen.
- **Small intestine**; sparse gram-positive flora, **Lactobacilli** and *Enterococcus faecalis*.
- **large intestine (colon)** : highest, **E. coli**, anaerobic bacteria.
- **Intestinal tract is sterile at birth.**

# The Normal Flora of Humans ( Human Microbiota)

## Good and Bad Bacterial Flora



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# The Normal Flora of Humans ( Human Microbiota)

- Normal Flora of the Urogenital Tract
- Urinary bladder, upper urinary tract; are normally sterile.
- Some enteric bacteria (e.g. *E. coli*, *Proteus*) and Corynebacteria, which are probably **contaminant urine from the skin.**
- **Vagina: flora influenced by estrogen.**
- Colonized after birth with Corynebacteria, Staphylococci, Streptococci, *E. coli*.
- Lactobacilli are dominate
- **low pH of the vaginal epithelium prevents pathogenic**