Lecture 2

Normal Flora

- Additional Notes
- Important
- Explanation
- Examples

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OBJECTIVES:

- Define the terms: *Normal Flora, Resident flora, Transient flora* and carrier state
- Know the origin of normal flora.
- Know the importance of normal flora with examples, including importance as:
  - ✓ Source of opportunistic infection.
  - ✓ Immunostimulation.
  - ✓ Nutrition: Vitamins production.
  - ✓ Production of Carcinogens.
  - ✓ Protection against external invaders.
- Know areas of the body with normal flora (GIT, Urogenital tract, and skin) and most common types of organism in these areas and relation to pathogenicity of these organism.
- Know sites of the body with no normal flora e.g. sterile body sites and the importance of this fact in relation to interpretation of culture results.

NORMAL FLORA:

- Normal flora are microorganisms that are frequently found in a particular site in normal healthy individual, they are mostly bacteria and it doesn't cause any illness.
- Normal flora is divided into different types:

✓ Commensals: natural relationship with host.

✓ Residents: present for a long time.

✓ Transients: present for a short time.

✓ Carrier state: this type is different from the other because it is potentially pathogenic. Ex: Streptococcus Pneumoniae

- Newborn is sterile from normal flora in utero. After birth, it will be exposed to many sources of normal flora Ex: mother's genital tract and skin.

NORMAL FLORA'S EFFECTS:

- Normal flora has beneficial effects:

✓ Immunostimulation: produce antibody to protect the body.

✓ Exclusionary effect: vaccum effect and protection from external invaders.

✓ Production of essential nutrients: vit. K & B by some normal intestinal flora Ex: Eschericia Coli

- In the other hand normal flora has some harmful effects:

✓ Source of opportunistic infections: Ex: Staphylococcus epidermidis

✓ Reaction with normal tissue components: Ex: the reaction between intestinal flora and the antigens of A&B blood substances.

✓ Production of carcinogens: Some normal flora may be modify through their enzymes chemicals in our diets. Ex: Artificial Sweeteners.

DISTRIBUTION OF NORMAL FLORA:

- Internal organs except alimentary tract are STERILE at health.
- Sterility maintained by:

✓Local defense mechanisms
✓Chemical substances in serum & tissues. Ex: Antibodies.
✓Pahgocytic activity of polymorphomononucleocytes (PMN)

- Areas of the body with normal flora:

✓Respiratory tract
✓Gastrointestinal tract
✓Genital tract
✓Skin
✓External auditory meatus.

- Respiratory tract flora:

✓ Lower respiratory tract is STERILE.

✓ Nose normal flora: Ex: Staphylococcus epidermidis.

✓ Oropharynx flora: Ex: Viridance Streptococci & Corynebacteria.

There are also some potential pathogens in the oropharynx Ex: Haemophilus influenzae & Pneumcoccus and others are less common Ex: Streptococcus pyogenes & Neisseria meningitidis.

- Genital tract flora:

✓ Female genital tract is heavily colonized by bacteria because of the vaginal secretion.

✓ Male & Female distal urethra is considered as skin so it has Staphylococcus epidermidis.

✓ Female vagina flora: Ex: Lactobacilli it is important to maintain the PH of the vagina.

- Skin flora:

Ex: Propionibacterium acnes, Staphylococcus epidermidis & Staphylococcus aureus[1].

- External auditory meatus flora:

Ex: Staphylococcus epidermidis,
AFB (Acid Fast Bacilli)[2]

[1] It is considered as potential pathogens.

[2] Occasionally found in ear wax.

- Gastrointestinal tract flora:

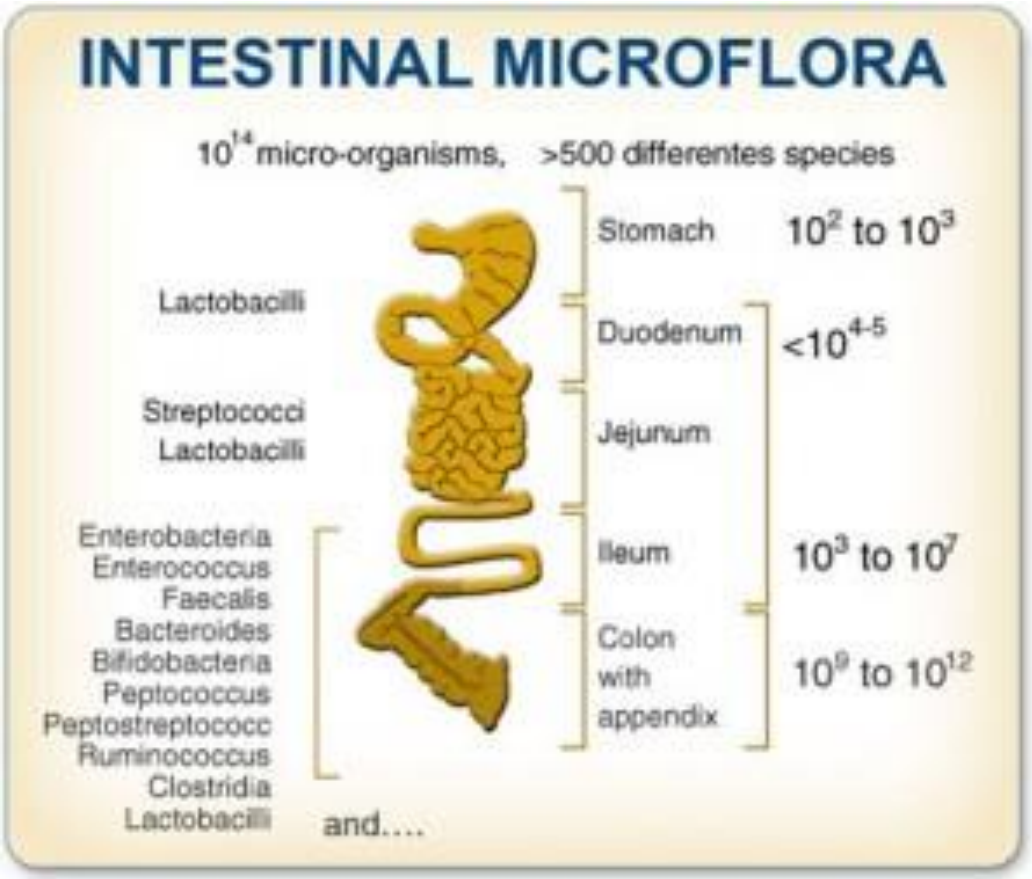
✓ Empty stomach is STERILE due to gastric acid.

✓ Duodenum, jejunum & upper ileum have small amount of flora, but Large intestine is heavily colonized by flora.

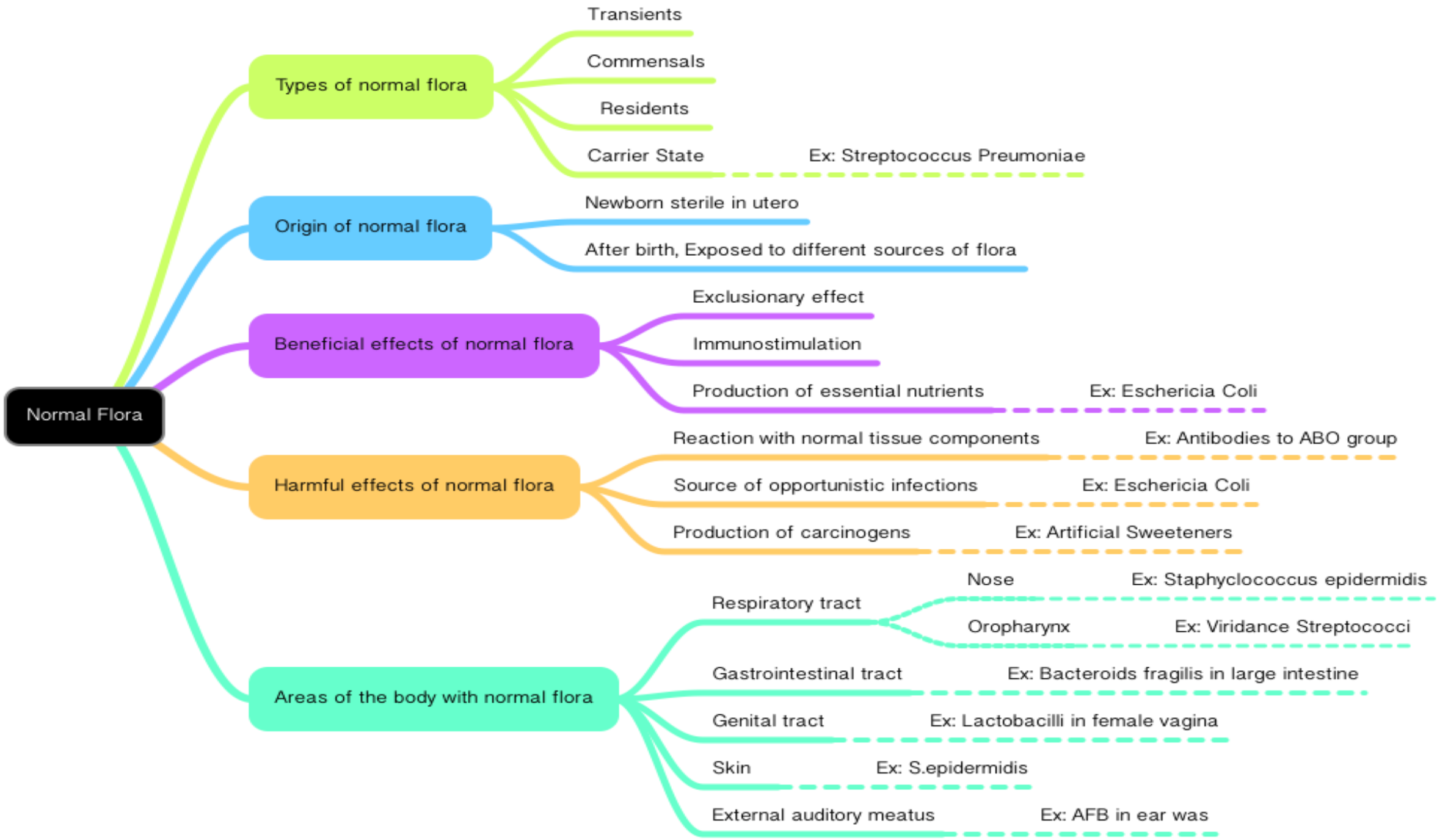
✓ 1/3 of stool weight is anaerobes bacteria, mainly dead.

Bacteroids fragilis group is dominant anaerobes also Bifidobacterium & Lactobacilli.

Less common: Eschericia Coli



You can notice that the most part of Gastrointestinal tract which is heavily colonized by bacteria is the large intestine.


Normal Flora
Types of normal flora
Transients
Commensals
Residents
Carrier State
Ex: Streptococcus Preumoniae
Origin of normal flora
Newborn sterile in utero
After birth, Exposed to different sources of flora
Beneficial effects of normal flora
Exclusionary effect
Immunostimulation
Production of essential nutrients
Ex: Eschericia Coli
Harmful effects of normal flora
Reaction with normal tissue components
Ex: Antibodies to ABO group
Source of opportunistic infections
Ex: Eschericia Coli
Production of carcinogens
Ex: Artificial Sweeteners
Areas of the body with normal flora
Respiratory tract
Nose
Ex: Staphyclococcus epidermidis
Oropharynx
Ex: Viridance Streptococci
Gastrointestinal tract
Ex: Bacteroids fragilis in large intestine
Genital tract
Ex: Lactobacilli in female vagina
Skin
Ex: S.epidermidis
External auditory meatus
Ex: AFB in ear was

Quiz

1.Which type of normal flora is potentially pathogenic?

a) Carrier state b) Residents c) Commensals d) Transient

2.Staphylococcus epidermidis are found in:

a) Female Vulva b) Skin c) Upper respiratory tract d) all of the above

3…… is a source of opportunistic infection.

a) Antibodies b) Eschericia Coli c) Bacteroids Fragillis d) Corynebacteria

4.Internal organs except alimentary tract are sterile at health.

a) T b)F

5…… is important to maintain the PH of vagina.

a) S.epidermidis b) E.coli c) Lactobacilli d) none of the above

ANSWERS: 1.A 2.D 3.B 4.A 5.C