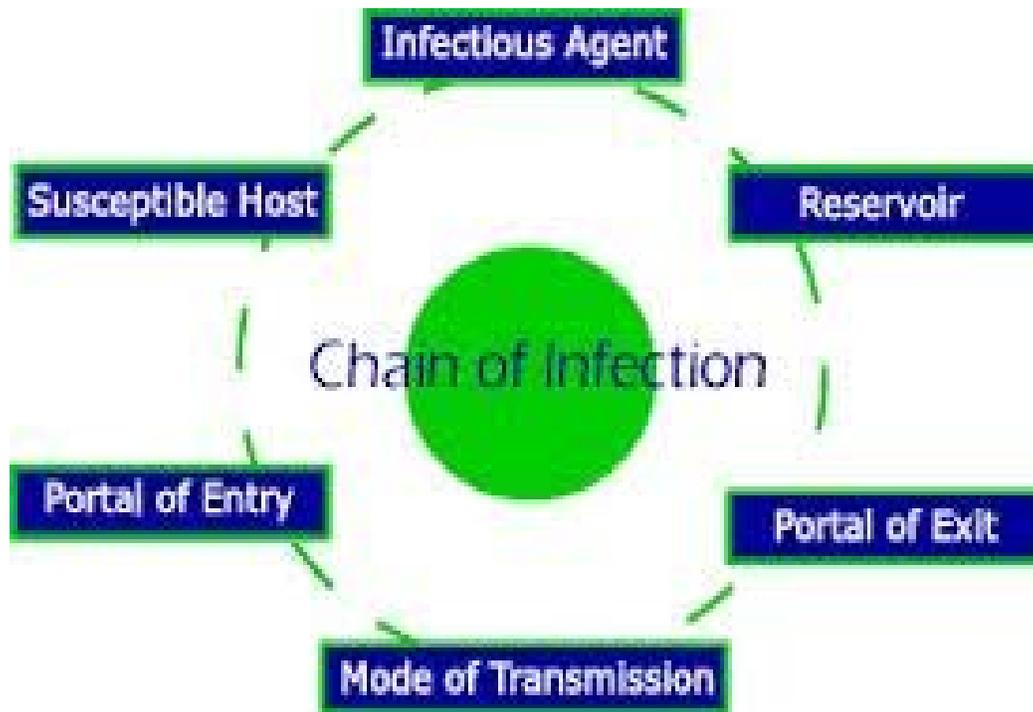


Lecture 3 : Fundamentals of Nursing

Chain of Infection



Chain of infection :

- The chain of infection refers to those elements that must be present to cause an infection from a microorganism.
- Basic to the principle of infection is to interrupt this chain so that an infection from a microorganism does not occur in client.

1. Infectious agent: microorganisms capable of causing infections are referred to as an infectious agent or pathogen, Infectious agent include:

1. Bacteria
2. Viruses
3. Fungi

a. Bacteria: The most significant and most commonly observed infection-causing agents in health care institutions. Common bacterial infections include diarrhea, pneumonia, gonorrhea, meningitis, and urinary tract infections., Can be categorized according to :

1. Shape :

- Spherical كروي (cocci)
- Rod shaped عصا (bacilli)
- Corkscrew shaped لولبي (spirochetes)

2. Reaction to Gram stain:

- Gram positive bacteria
- Gram negative bacteria

3. Bacterial is their need for oxygen:

- Aerobic
- Anaerobic

b .Viruses: Is the smallest of all microorganisms, visible only with an electron microscope, such as virus cause common cold and AIDS, Organisms that live only inside cells. They cannot get nourishment or reproduce outside cells. Common viral infections include influenza, measles, common cold, chickenpox, hepatitis B, and AIDS .

C. Fungi: Plant-like organism (molds and yeasts) that also can cause infection, are present in the air, soil, and water. Fungi can cause infections of the hair, skin, nails, and mucous membranes.

Under normal conditions, some organisms may not produce disease .

Microorganism that commonly inhabit various body sites and are part of the body's natural defense system are referred to as normal flora .

Other factors may intervene causing this usually harmless organism to generate an infection . Bacterial that normally cause no problem but, with certain factors, may potentially be harmful .For example .one type of Escherichia coli normally resides in the intestinal tract and causes no harm. However , if it migrates to the urinary tract ,it can lead to UTI.

2. Reservoir:

It for growth and multiplication of microorganisms is the natural habitat of the organism. Possible reservoirs that support organism pathogenic to humans include other people ,animals ,soil, food ,water ,and not motile objects.

3.Portal of exit: the means in which the pathogen escapes from the reservoir and can cause disease; there is usually a common escape route for each type of microorganism; on humans, common escape routes are the gastrointestinal, respiratory and the genitourinary tract. as well as breaks in the skin. Blood and tissue can also be portals of exit for pathogens. Portal of exit Includes:

- Sputum from respiratory tract.
- Semen, vaginal secretions, or urine, from the genito-urinary tract.
- Saliva and feces, from the gastrointestinal tract.
- Blood.
- Draining wounds.
- Tears.

4. Mode of transmission:

Organism can enter the body by way of the contact route, either directly or indirectly , Contaminated blood, food, water, are vehicles of transmission. Vectors such as mosquito , and lice. Microorganism can also be spread through the airborne route when infected host coughs, sneezes, or talk.

1. **Direct contact:** describes the way in which microorganisms are transferred from person to person through biting, touching, kissing, or sexual intercourse; droplet spread is also a form of direct contact but can occur only if the source and the host are within 3 feet from each other; transmission by droplet can occur when a person coughs, sneezes, spits, or talks.
2. **Indirect contact:** can occur through fomites (not motile objects or materials) or through vectors (animal or insect, flying); the fomites or vectors act as vehicle for transmission .
3. **Air:** airborne transmission involves droplets or dust; droplet nuclei can remain in the air for long periods and dust particles containing infectious agents can become airborne infecting a susceptible host generally through the respiratory tract .

5. Portal of entry:

The portal of entry is the point at which organism enter a new host. The organism must find a portal of entry to a host or it may die. common escape routes are the gastrointestinal, respiratory and the genitourinary tract.

6. Susceptible host:

Is the degree of resistance the potential host has to the pathogen, in humans this may occur if the person's resistance is low because of poor nutrition, lack of exercise of a coexisting illness that weakens the host.