

Asepsis and infection control

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Introduction:

A major concern for health partitions is the danger of spreading microorganisms from person to person and from place to place . Microorganisms are naturally present in almost all environments . Some are beneficial ;some are not. Some are harmless to most people, and Others are harmful to many people . Still others are harmless except in certain circumstances.



Systematic approach to the control of infections include:

1. Mass immunization programs
2. Laws concerning safe sewage disposal
3. Regulations for the control of communicable disease
4. Hospital infection-surveillance programs



▶ **Prevention of infection is a major focus for nurses.as primary caregivers, nurse are involved in**

▶ 1. Identifying

▶ 2. Preventing

▶ 3. Controlling

▶ 4. Teaching patient about infection control



Use of the
nursing process

can prove critical in breaking the cycle
of infection



Terminologies



Asepsis

Is the absence of organism causing disease



Medical asepsis(clean)

Refers to practices which help reduce the number and hinder the transfer of disease-producing micro organism from one person or place to another



Surgical asepsis (sterile)

Practices that render and keep objects and areas free from organisms.



Microorganism

A tiny living animal or plant that can cause disease

,most are visible only with a microscope



Pathogen

A microorganism that causes disease



Contamination

Means to make something unclean, such as area equipment ,if it contain microorganisms that cause disease.



Disinfectant

A substance used to destroy pathogens but not necessarily their spores, in general not intended for use on persons.



Antiseptic

A substance used to destroy pathogens on living object such as skin and mucous membrane .



Disinfection

A process by which pathogens, but not spores, are destroyed



Infection

The invasion of the body by disease-producing microorganism and the body's reaction to their presence .



Cross -infection

Is an infection transmitted from an infected person or an object to other persons or objects



Inflammation

Inflammation is a response of a tissue to injury, often injury caused by invading pathogens. It is characterized by:

- ▶ increased blood flow to the tissue causing
- ▶ increased temperature,
- ▶ redness,
- ▶ swelling, and
- ▶ pain.



Sterilization

A process by which all microorganisms including spores are destroyed



Nosocomial infection

also known as a **hospital-acquired infection** or **HAI**, is an infection whose development is favored by a hospital environment, such as one acquired by a patient during a hospital visit



Isolation technique

refers to the precautions that are taken in the hospital to prevent the spread of an infectious agent from an infected or colonized patient to susceptible persons.



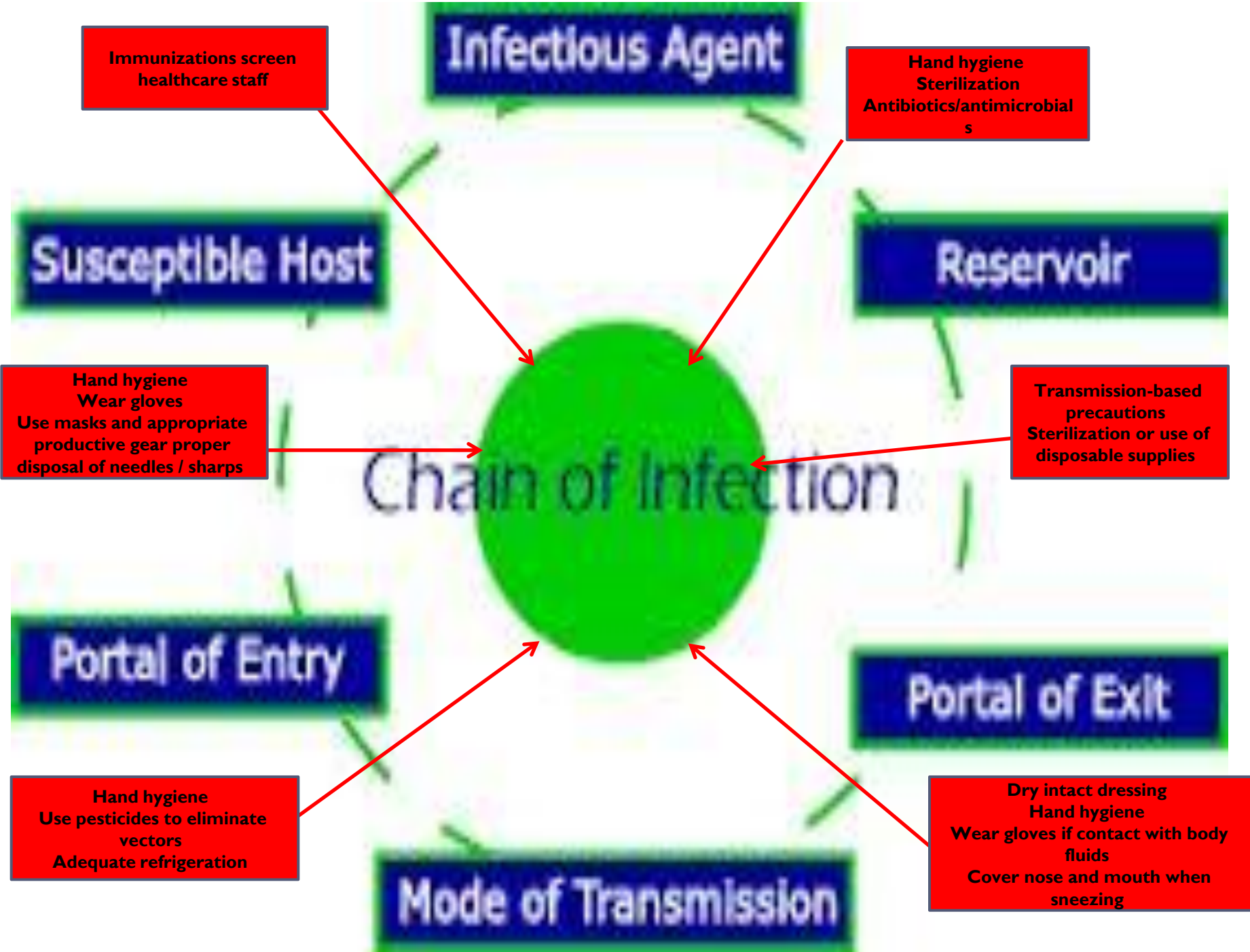
Endemic

The occurrence of certain diseases as they relate to a population or geographic area.



Chain of infection





1. Infectious agent

1. Bacteria

2. Viruses

3. Fungi



1. Bacteria

The most significant and most commonly observed infection-causing agents in health care institutions




Can be categorized according to :

1. Shape

- spherical (cocci)
- rod shaped (bacilli)
- corkscrew shaped (spirochetes)

2. Reaction to Gram stain

- Gram positive bacteria
 - Gram negative bacteria
-
- 

3. Bacteria and their need for oxygen

- aerobic
- anaerobic



2. Virus


Is the smallest of all microorganisms, visible only with an electron microscope ,such as virus cause common cold and AIDS



3. Fungi

Plant-like organism (molds and yeasts) that also can cause infection ,are present in the air ,soil, and water .

Example of disease cause by fungi include athlete's foot ,ringworm, and yeast infections.



An organism's potential to produce disease in a person depends on verity of factors, including:


1. Number of organism
 2. Virulence of the organism , or its ability to cause disease.
 3. Competence of the person's immune system
 4. Length and intimacy of the contact between the person and the microorganism.
-



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 are referred to as opportunists.

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 inanimate objects.

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Other reservoir



3. Portal of exit

The portal of exit is the point of escape for the organism from the reservoir . The organism that cannot extend its influence unless it moves away from its original reservoir . Usually, each type of microorganism has a primary exit route . In humans, common portals of exit or escape routes include the respiratory, gastrointestinal , and genitourinary tracts, as well as breaks in the skin. Blood and tissue can also be portals of exit for pathogens.



4. Means of transmission

Organism can enter the body by way of the contact route, either directly or indirectly ,

Contaminated blood, food, water, or inanimate objects (fomites) are vehicles of transmission.

Vectors such as mosquito ,ticks, and lice.

Microorganism can also be spread through the airborne route when infected host coughs, sneezes, or talk.



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.



6. Susceptible host

Is the degree of resistance the potential host has to
the pathogen



Stages of infection

An infection progresses through the following phases:

1. incubation period
2. prodromal stage
3. full stage of illness
4. convalescent period

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The body's defense against infection

1. Body's normal flora
2. Inflammatory response
3. Immune response

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2. Inflammatory response

The inflammatory response is a protective mechanism that eliminates the invading pathogen and allows for tissue repair to occur. ▶

The inflammatory response also occurs in response to injury .it is either an acute or chronic process. ▶



The **vascular and cellular stages** are the main component of the inflammatory process and these physiological processes are responsible for the appearance of the cardinal signs(redness , heat, swelling, pain, and loss of function)



Vascular stage

Small blood vessels constrict



Vasodilation of arterioles and venules



Increase blood flow



Redness and heat

Histamine released



Increase permeability of vessels



Allow protein-rich fluid pour into area



Swelling, pain, and loss of function



Cellular stage

White blood cells(leukocytes)



Neutrophils (phagocytes)



Engulf the organism and consume cell debris



Exudate (fluid, cell), Clear (serous), Red blood cell (sanguinous), Pus (purulent)



Regeneration



Scar tissue



3. Immune response

The foreign material is called an antigen
,and the body responds to the antigen by
producing an antibody .(humoral immunity)



Cell mediated defense (cellular immunity)

Increase the number of lymphocytes (white blood cell)

Help to defend the body specifically against bacterial, viral, and fungal infections, as well as malignant cell.

