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**COURSE :1 YEAR BSC NURSING**

**UNIT XI- INFECTION CONTROL**

**TOPIC- NATURE OF INFECTION**



# INTRODUCTION



- Current trends, public awareness, and rising costs of health care have increased the importance of infection prevention and control.. Regardless of where they practice, preventing the transmission of microorganisms is a concern of all nurses. One way that nurses accomplish this goal is by asepsis.



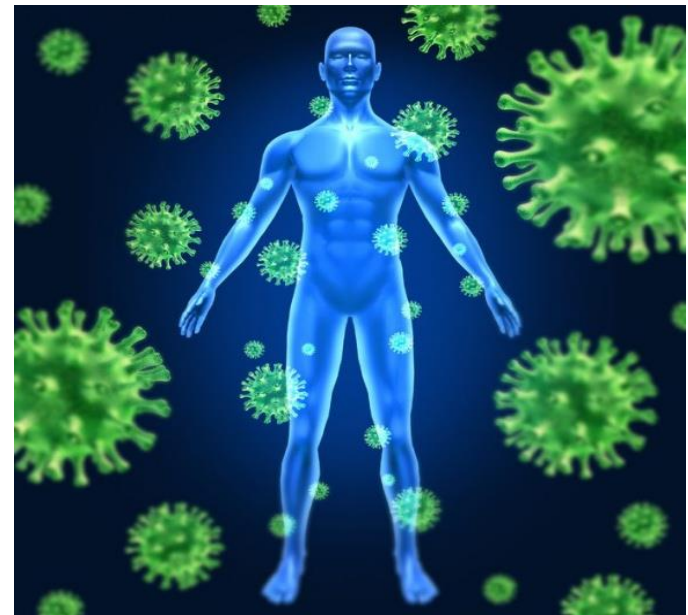


# INFECTION



## DEFINITION

Injurious contamination of body or parts of the body by bacteria, viruses, fungi, protozoa and rickettsia or by the toxin that they may produce.

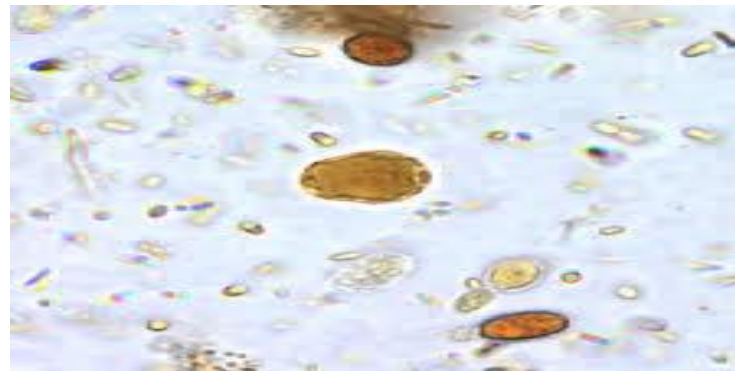




# NATURE OF INFECTION



- An infection is the invasion of a susceptible host (e.g. a patient) by potentially harmful microorganisms (pathogens), resulting in disease. The principal infecting agents are bacteria, viruses, fungi and protozoa.

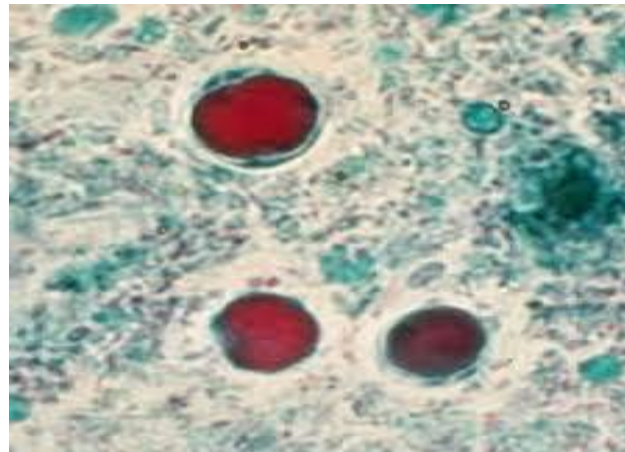




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- All persons have microorganisms on their skin, but usually no disease results.
- Disease or infection results only if the pathogens grows or multiply and alter normal tissue function.



- Not all are harmful
  - Normal flora or resident flora (microorganisms) are found on skin, in the intestines and vagina
  - Some are necessary to maintain normal bodily functions
- Escherichia coli (E. coli):

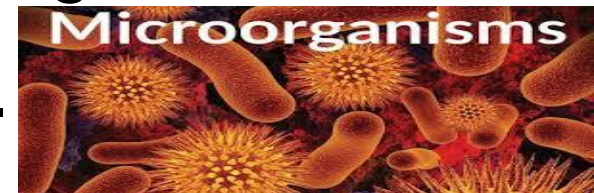




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- Some microorganisms are part of the normal flora but have no beneficial role .
- Normally they do no harm unless the person is susceptible to infection due to suppression of the body's immune response
- The immune response: the body fights infection by producing antibodies.





# Continued.....



- Pathogens are disease producing microorganisms
- Pathogenicity refers to the ability of a microorganism to produce disease.
- Virulence refers to the frequency, with which a pathogen causes diseases.







# GROWTH OF MICROORGANISMS



- Aerobic – require oxygen to live
- Anerobic – do not require oxygen to live
- Many microorganisms thrive in warm, moist, dark environments like the human body which becomes a host to the microorganism





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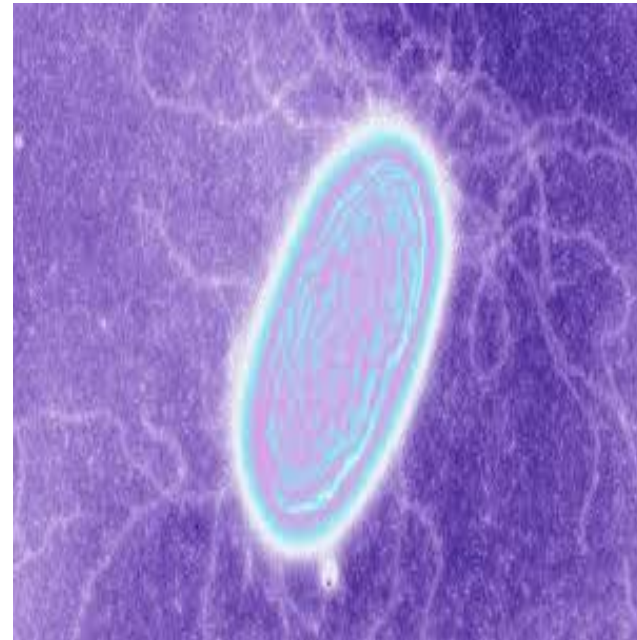
- Symbiosis – the host benefits
- Neutralism – no damage is done to the host
- Parasitic – the host is damaged, the pathogen causing damage is called the parasite.



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- Microbe – a pathogenic microorganism
- Classifications of plant and animal microbes:

1. Bacteria
2. Viruses
3. Fungi
4. Rickettsia
5. Protozoa

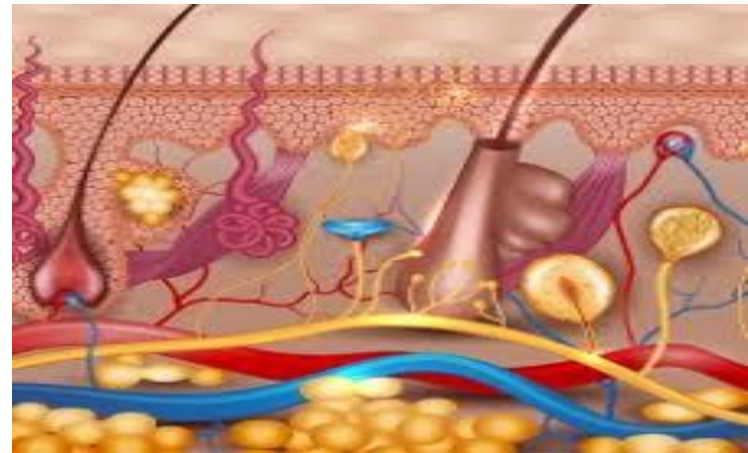




# CHAIN OF INFECTION



- The life cycle of pathogens is frequently described as an uninterrupted chain of events. For microorganisms to spread disease, they must grow, reproduce, and move from one source to another.



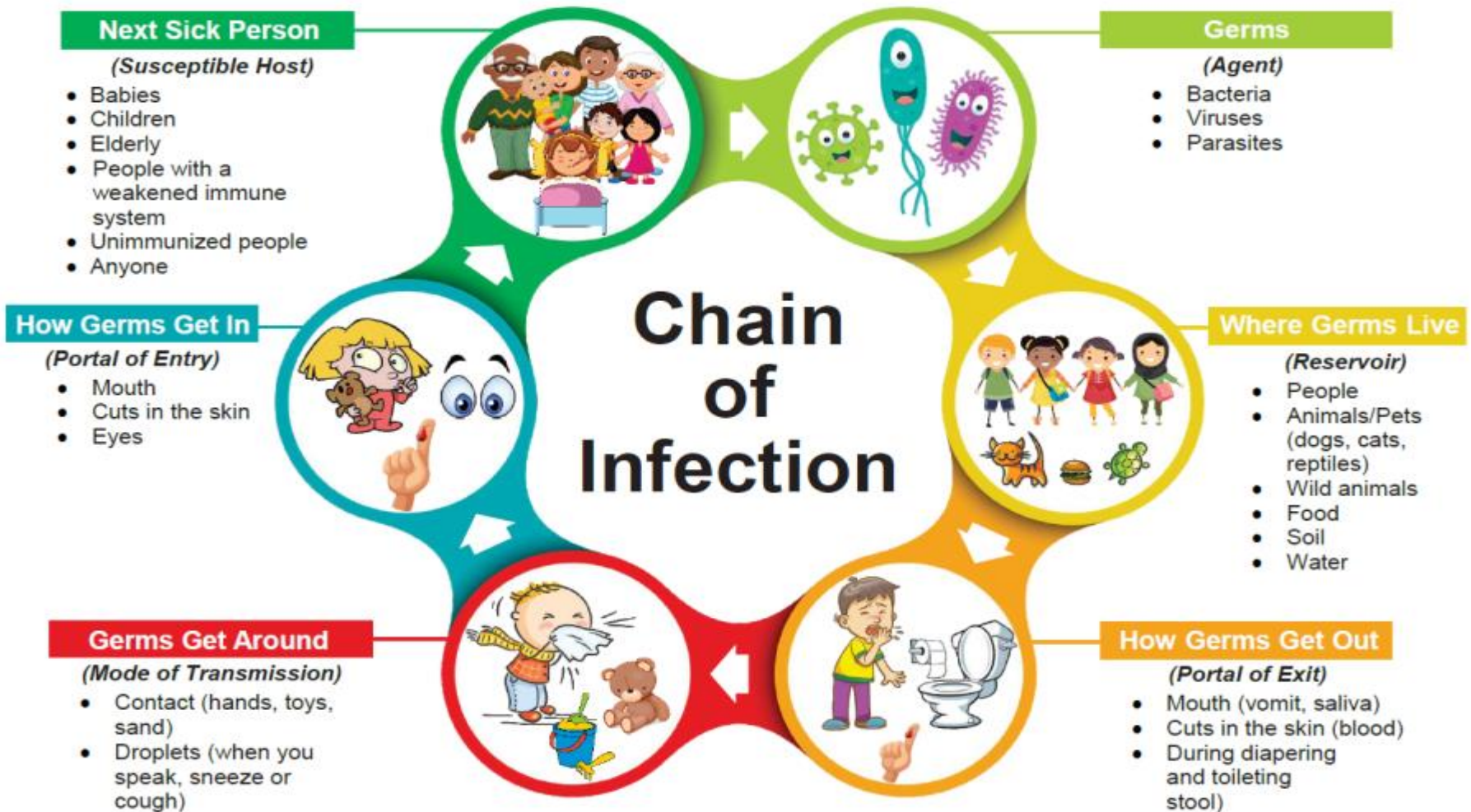


# CHAIN OF INFECTION



- The chain of infection includes the infectious agent, the source, the portal of exit, the mode of transmission, the portal of entry, and a susceptible host.
- Infection develops if the links in this chain remain intact. Preventing infection includes breaking the chain of infection

# CHAIN OF INFECTION



# INFECTIOUS AGENT

## Infectious Agent

### Infectious Agent/ Pathogens

- Bacteria
- Virus
- Fungus
- Rickettsia
- Protozoa
- Parasites





# INFECTIOUS AGENT



- The first link in the chain of infection is the microbial agent or pathogens.
- The ability of the infectious agent to cause disease depends on its Pathogenicity, virulence, invasiveness, and specificity.





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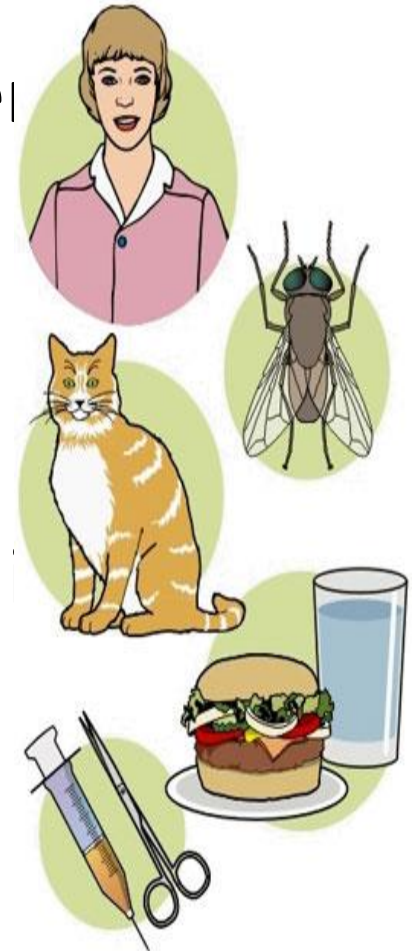


- The more pathogenic, virulent, and invasive the organism, the more likely it can overcome normal body defenses, causing an infection.
- These four characteristics are determined by the structure or chemical composition of the microorganism



# SOURCE /RESERVOIR

- A reservoir is organism or place where microorganisms survive, multiply, and wait to transfer to a susceptible host.
- A source is any place from which an agent disseminated to the host.





# Continued....



- It includes medications, air, food, water, or any other material on which organisms can find nourishment and survive.
- It include other patients, health care personnel, family members, visitors, and patients themselves.
- Animals are often sources of disease for human beings. Insect and rats are good examples.



# PORTAL OF EXIT



- Portal of exit provides a means for the microorganism to leave the source



# MODE OF TRANSMISSION



- It refers to the way in which the organism moves or is carried from the source's to portal of exit.



# Continued....



- There are five main modes or routes of transmission
  - Contact
  - Vector borne
  - Air borne
  - Droplet
  - Common vehicle



# DROPLET



- Droplet generated by sneezing Coughing or respiratory tract procedures like Bronchoscopy or suction



# VECTOR TRANSMISSION



- Transmitted through insects and Other invertebrates animals such as mosquitoes and fleas.





# Continued.....



- Vectors can be biologic or mechanical. Biological vectors are living creatures that carry pathogens, such as rats, insects, or birds. Mechanical vectors are inanimate objects that are contaminated with infected body fluids like central line catheter, needles and syringes shared by IV drugs users



# AIRBORNE TRANSMISSION



- Tiny droplet nuclei that remain (<5) suspended in air.



# VEHICLE TRANSMISSION



- COMMON VEHICLE TRANSMISSION Transmitted indirectly by materials contaminated with the infections.  
e.g. foods can carry Salmonella, blood can carry Hepatitis and HIV



# CONTACT TRANSMISSION



Most important and frequent mode of transmission of nosocomial infections, is divided into two subgroups:

- Direct-contact transmission
- Indirect-contact transmission



# DIRECT TRANSMISSION



- Direct-contact transmission Involves a direct body surface-to-body surface contact causing the physical transfer of microorganisms between a susceptible host and an infected or colonized person, such as occurs when a person turns a patient, gives a patient a bath, dressing changes and inserting devices.



# INDIRECT TRANSMISSION



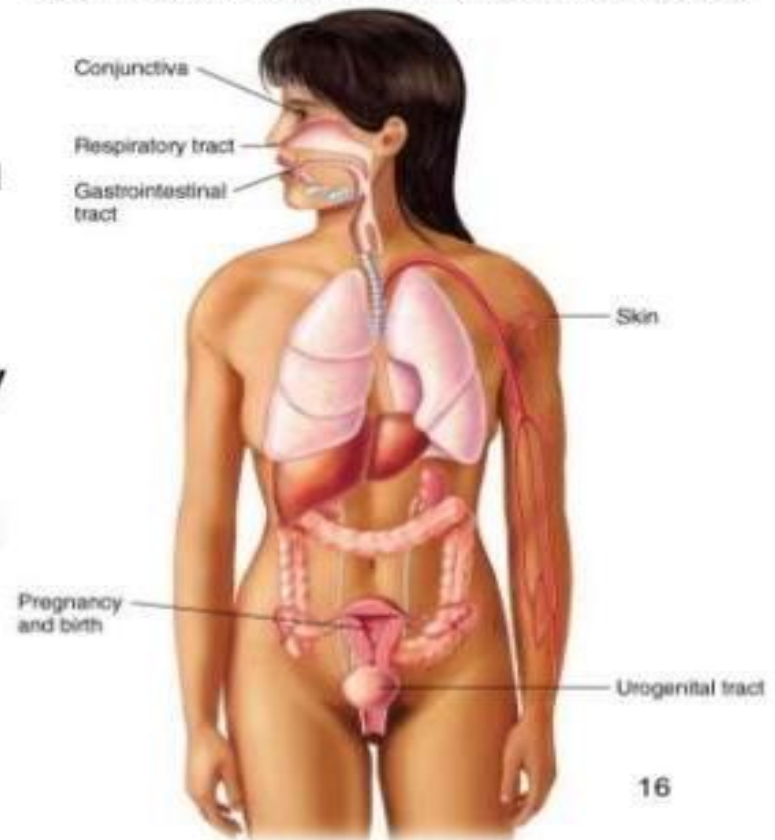
- Indirect-contact transmission Involves contact of a susceptible host with a contaminated intermediate object, usually inanimate, such as shared patient care devices, shared pediatric toys, contaminated instruments, needles, or dressings, or contaminated gloves that are not changed between patients

# PORTALS OF ENTRY

## Portals of entry

- Microbes enter in body by various transmission methods
- Most pathogens have specific portals on entry
  - 1) **Skin**
  - 2) **Gastrointestinal tract**
  - 3) **Respiratory tract**
  - 4) **Urogenital**
  - 5) **Placenta**
  - 6) **Mucous Membrane**

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# SUSCEPTIBLE HOST



Infection  
Prevention  
& Control

## Susceptible host

A host is a person whose own body defense mechanisms, when exposed, cannot withstand the invasion of pathogens.

- Some people are more susceptible due to:
  - Low immunity
  - Poor physical resistance
  - Being very young or old
  - Being malnourished
  - Underlying disease







# CONCLUSION



- Infection is one of the leading causes of preventable death. Regardless of all work area, preventing the transmission of organisms is concern of all nurses.