WEEK 4 INTENDED LEARNING OUTCOMES: (INFECTION CONTROL)

- Define the terms microorganism and health care associated infections
- Identify modes of transmission
- Describe the chain of infection
- Describe principles of infection control including hand hygiene, prevention of cross infection, disinfection and sterilisation techniques, standard and transmission based precautions
- Apply principles of infection prevention and control
- Conduct an assessment of a patient with suspected or known infection
- Use the nursing process to identify problems and interventions relating to infection control (include cues, actual/potential problems, interventions and evaluation)
- Safely demonstrate appropriate use of gloves and correct disposal of wastes
- Document assessment findings relating to infection control accurately
- Perform a nursing handover of patient with suspected or known infection using the ISBAR tool
- Demonstrate Basic Life Support (BLS)

Common Types of Bacteria --- passed on by our hands

SALMONELLA
- Found in eggs, poultry, unpasteurised milk and raw vegetables

LISTERIA
- Found in a variety of chilled ready-to-eat food
- Can cause gastroenteritis or flu-like symptoms

ESCHERICHIA COLI (E. COLI)
- Can be caught from eating or handling raw vegetables, meat and unpasteurised milk

SYPHYLOCOCCUS AUREUS
- Found in the nose and throat and on hair and skin
- Can be picked up from other peoples' towels, razors and sports equipment

BACILLUS SPP.
- Found in a wide range of food products; e.g. meat, milk, vegetables and rice
- Some species will grow in warm environments -- e.g. kitchen

PPE -- personal protective equipment

- Mask, gown, goggles, gloves
- Protect yourself from contamination

MICRO-ORGANISM: microscopic organism, not visible to the naked eye; such as: bacteria, viruses, fungi and protozoa, parasites and prions.

Bacteria
- The most common infection-causing micro-organisms
- Can live and be transported via air, water, food, soil, body tissues and fluids and inanimate objects

Viruses
- Consist primarily of nucleic acid
- Must enter living cells in order to reproduce
- Common virus families include: rhinovirus (common cold), hepatitis, herpes and human immuno-deficiency virus (HIV)

Fungi
- Include yeasts and moulds
- E.g. *Candida albicans* is a yeast considered to be a normal flora in the human vagina

Parasites

- Live on other living organisms
- E.g. helminths (worms) and anthropods (scabies, fleas, ticks)

Prions

- Infective particles consisting only of protein
- Responsible for a group of fatal neurological disorders known as transmissible spongiform encephalopathies (TSEs)

RESIDENT FLORA: micro-organisms that normally reside on the skin and mucous membranes and inside the respiratory and gastrointestinal tracts

TRANSIENT ORGANISMS: an organism that clings to the skin's surface but usually does not replicate there

INFECTION: an invasion of body tissue by micro-organisms and their proliferation

- Infection occurs when newly introduced or resident micro-organisms succeed in invading a part of the body where the host's defence mechanisms are ineffective and the pathogen causes tissue damage

DISEASE: a detectable alteration in normal tissue function

COMMUNICABLE DISEASE: the resulting condition if the infectious agent can be transmitted to an individual by direct or indirect contact or as an airborne infection

- **E.g.** colds, influenza, measles, chickenpox, rubella, diphtheria and polio -- as well as gastrointestinal and sexually transmitted infections

Methods of transmission of communicable diseases:

- By contact with aerosols from an infected host
- Via body fluids (blood, sputum, urine, semen, faeces)
- By infected skin cells shed into the environment
- From open wounds or lesions
- From contact with contaminated surfaces

NON-COMMUNICABLE DISEASE: those which do not normally spread from an infected host to a healthy person during normal contact and daily living activities -- e.g. tetanus

LOCAL INFECTION: limited to the specific part of the body where the micro-organisms remain

SYSTEMIC INFECTION: if the micro-organisms spread and damage different parts of the body

ACUTE INFECTION: generally appear suddenly or last a short time

CHRONIC INFECTION: occurs slowly, or over a very long period, lasting months or years

ENDOGENOUS INFECTION: caused by the micro-organisms already present on the individual's body acting as a reservoir

EXOGENOUS INFECTION: caused by micro-organisms from a source external to the individual

Chain of Infection

A cycle of infection, beginning with the source of infection, continuing with transportation of the pathogen, and ending with entry into the body.

Aetiological Agent (micro-organism)

Reservoir (source)

- Common sources are: other humans, the individual's own micro-organisms, plants, animals or the general environment
- People are the most common source of infection for others and for themselves
- CARRIER: a person or animal reservoir of a specific infectious agent that usually does not manifest any clinical signs of disease (e.g. *Anopheles* mosquito = reservoir -- carries malaria virus but is unaffected by it)
- Food, water sources and faeces can also be reservoirs

Portal of Exit from Reservoir

- Micro-organism must leave reservoir before an infection can establish itself in a host
- E.g. portal of exit from the respiratory tract (reservoir) = nose or mouth through sneezing, coughing, breathing or talking

Method of Transmission

1. **Direct Transmission:** involves immediate and direct transfer of micro-organisms from person to person through touching, biting, kissing or sexual intercourse

- Droplet spread -- through sneezing, coughing, spitting, singing or talking - can project droplet spray onto mucous membranes of the eye, nose or mouth of another person

2. **Indirect Transmission**

a. Vehicle-Borne Transmission

- A vehicle is any substance serving as an intermediate means to transport that introduces an infectious agent into a susceptible host
- E.g. Inanimate materials or objects: handkerchiefs, toys, soiled clothes, cooking or eating utensils, surgical instruments or dressings

B. Vector-Borne Transmission

- A vector is an animal or flying or crawling insect serving as an intermediate means of transporting the infectious agent
- Transmission may occur by injecting salivary fluid during biting or by depositing faeces or other materials on the skin through the bite wound or on an area of traumatised skin

3. **Airborne Transmission:** may involve droplets or dust, material is transmitted by air currents to a suitable portal of entry, usually the respiratory tract, of another person

Portal of Entry to the Susceptible Host

- Before a person can become infected, micro-organisms must enter the body
- Any break in the skin can readily serve as a portal of entry
- Often, micro-organisms enter the body of the host by the same route they used to leave the source

Susceptible Host

- Any person who is at risk for infection
- Impairment of the body's immune system, integumentary system and other biological factors increase susceptibility to infection
- E.g. age (very young, very old), immune deficiency conditions
- Age, heredity, level of stress, nutritional status, current medical therapy and pre-existing disease processes