



THE CHAIN OF INFECTION

The Chain of Infection is fundamental to infection prevention and control. All components of the chain of infection must be present for an infection to occur. If one of the 'links' in the chain is missing or is deliberately broken, the spread of disease to another is effectively controlled.

Hand hygiene is the single most effective way to break the chain of infection.

Links in the Chain of Infection

Infectious Agent

An infectious agent is a microorganism with the ability to cause an infectious disease. The greater the organism's virulence (ability to grow and multiply), invasiveness (ability to enter tissue) and pathogenicity (ability to cause disease), the greater the possibility the organism will cause an infection. Infectious agents are bacteria, virus, fungi and parasites.

Reservoirs

Reservoirs are a place within which microorganisms can thrive and reproduce. For example, microorganisms thrive in human beings, animals, and inanimate objects such as water.

Portal of Exit

A portal of exit is a way for a microorganism to leave the reservoir. For example, the microorganism may leave the reservoir through the nose or mouth when someone sneezes or coughs, or can be carried away from the body by feces from an infected bowel.

Mode (Means) of Transmission

The mode (means) of transmission is the route or method of transfer by which the infectious microorganism moves or is carried from one place to another to reach the new host. The modes (means) of transmission are: Contact (direct and/or indirect), Droplet, Airborne, Vector and Common Vehicle.

Portal of Entry

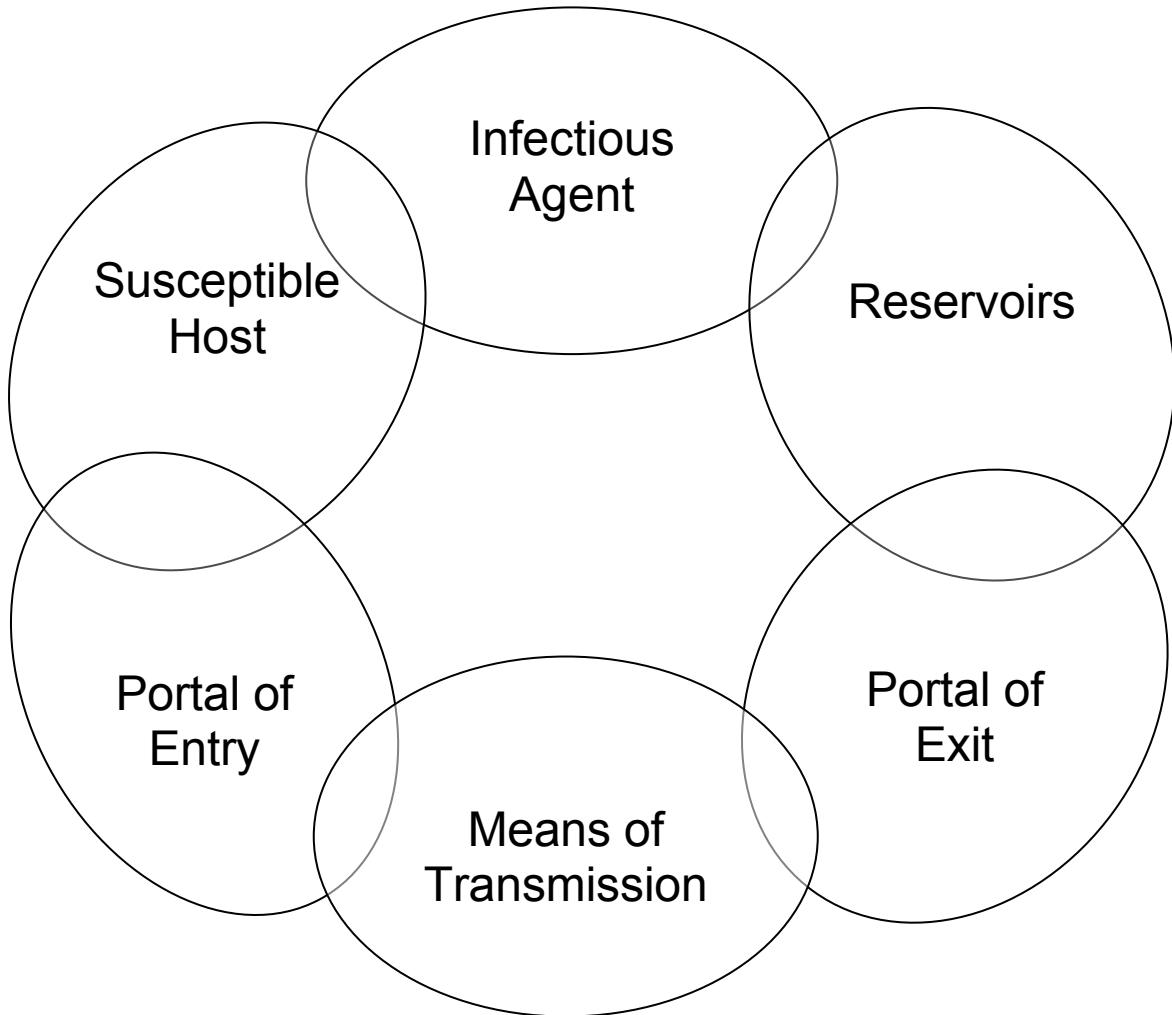
The portal of entry is the means by which the infectious microorganisms gains access into the new host. This can occur, for example, through ingestion, breathing, or skin puncture.

Susceptible Host

A susceptible host is a person who is susceptible to the disease, lacking immunity or physical resistance, to overcome invasion by the microorganism.



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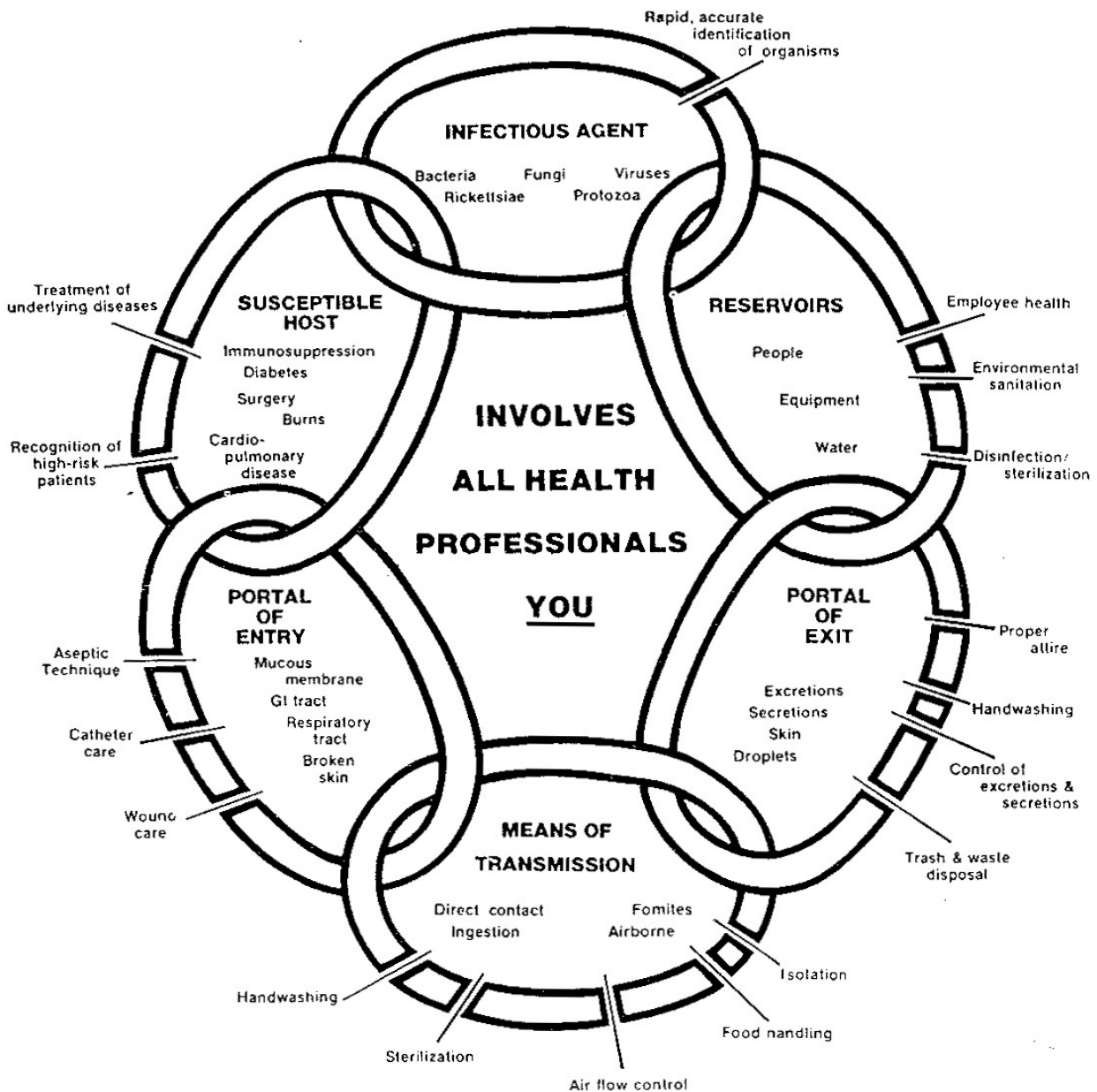


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Breaking the Chain of Infection

The transmission of any infectious microorganism can be controlled effectively by breaking the chain of infection. Each disease/infectious microorganism presents unique problems. Knowledge of the specific disease can break the chain at its weakest link. Routine Practices, Additional Precautions, aseptic technique and sterilization procedures prevent the spread of infectious microorganisms among residents, healthcare workers, families and visitors by breaking the chain of infection.





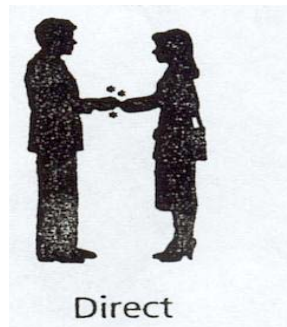
Transmission of Microorganisms

Microorganisms are transmitted in the following ways and in combination:

- Direct contact
- Indirect contact
- Droplet particles
- Airborne particles
- Common vehicle
- Vectorborne

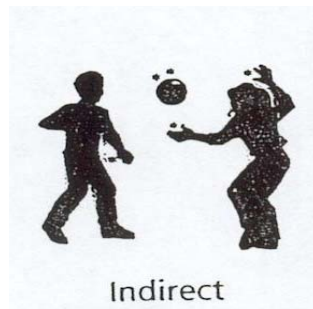
a. Direct contact transmission:

Direct contact transmission occurs when microorganisms are transferred by direct physical contact with an infected or colonized individual. Direct contact is one of the most common modes of transmission.



b. Indirect contact transmission:

Indirect contact transmission involves transfer of microorganisms via an object. Examples include, hands not washed between residents, contaminated gloves, objects in the resident's bed space or environment, medical equipment, and/or contaminated instruments. Indirect contact is also a common mode of transmission.





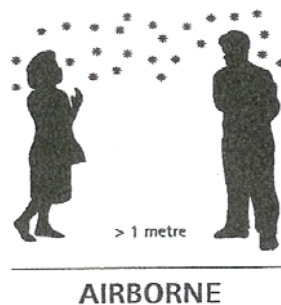
c. Droplet transmission:

Droplet transmission involves large droplets, ≥ 5 microns in diameter, that comes from the respiratory tract during coughing or sneezing, or during aerosol generating procedures such as suctioning. These droplets are propelled a short distance, < 1 meter through the air, and enter the nasal or oral mucosa of the new host. Some microorganisms transmitted by this route, especially respiratory viruses, survive on objects in the immediate environment of the resident. In these cases, droplets are also spread by direct and indirect contact (Droplet/Contact transmission).



d. Airborne transmission:

Microorganisms transmitted by this route are carried by dust or other small particles floating in the air and are < 5 microns in size. These microorganisms remain suspended in the air and are widely dispersed by air currents. Susceptible hosts, who may be some distance away from the source resident, even in different rooms inhale these microorganisms. Control of airborne transmission is the most difficult, as it requires control of airflow through special ventilation systems.





e. Common vehicle transmission:

Common vehicle transmission refers to transmission through a contaminated source. Examples include food, medication, intravenous fluid, or shared equipment that transmits infection to multiple hosts. This transmission may result in a large-scale outbreak.

f. Vectorborne transmission:

Vectorborne transmission refers to infections caused by animals and insects. Examples of these infections include, West Nile Virus and Dengue Fever. Appropriate facility construction and maintenance, closed or screened windows, and proper housekeeping prevent Vectorborne transmission. This type of transmission has not been reported in Canadian hospitals.