

E. The Mechanism of Infection

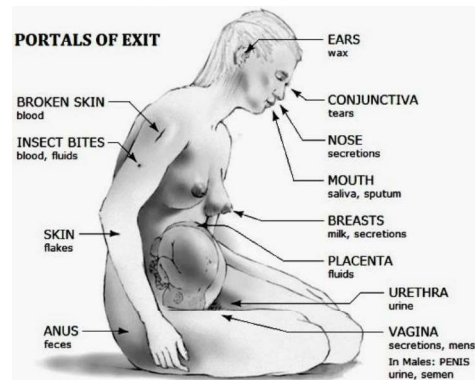
The *Mechanism of Infection*, includes six components or links comprising the “*Chain of Infection*”. In order to prevent epidemics and protect themselves, all health care workers – including massage therapists – must know how to break the chain.



1. Infectious Agent. For infection to occur, there must be a causative agent or pathogen. For humans, pathogens include different types of organisms such as viruses, bacteria, protozoa, and fungi.

2. Reservoir. A Reservoir is a place where pathogens reside as a source of infection. Here they live, reproduce, and stand by while awaiting an opportunity to transfer to another host. There are three types of reservoirs: (1) animal reservoir, (2) human carriers, and (3) nonliving reservoirs like air, water, food, dust, etc.

3. Portal of Exit. The Portal of Exit is the route by which a pathogen leaves the reservoir. Pathogens leave humans by way of blood, various bodily secretions (mucus, semen, vaginal secretions, etc.), urine, feces, skin lesions, and vomit. Many portals of exit also serve as portals of entry.



4. Mode of Transmission. Transmission of infectious disease can be direct or indirect. The modes of transmission are classified into three categories :

(1) *Contact Transmission*, (2) *Vehicle Transmission*, and (3) *Vector Transmission*.

MODE	DESCRIPTION	LEADING EXAMPLES
1 CONTACT <i>Transmission</i>	DIRECT CONTACT involves body contact between hosts. Ex: <i>touching, handshaking, scratching, biting, kissing, “beso-beso”, sexual contact, organ donation, blood transfusion, fluid transfer, etc.</i> Mother-fetus transmission occurs via the placenta and at childbirth. Direct contact with animals can also result in transmission.	<i>From humans: Warts, Herpes, Gonorrhea.</i> <i>From animals: Ringworm, Toxoplasmosis, Malaria, Tapeworm.</i>
	INDIRECT CONTACT involves the use of inanimate objects that happen to contain pathogens. Ex: <i>door handles, needles, toothbrushes, toys, money, tissues, clothing, dining ware, etc.</i>	<i>Common Cold, Enterovirus Infections, Influenza, Measles, Pneumonia, Tetanus, Whooping Cough, etc.</i>
	DROPLET CONTACT. Pathogens ride on mucus droplets by exhaling, sneezing, or coughing, <u>within a distance of one meter</u> .	<i>(SAME)</i>
2 VEHICLE <i>Transmission</i>	AIRBORNE TRANSMISSION. Pathogens ride on a cloud of dust particles or inside fluid droplets which enter through the respiratory mucus membranes. Ex: <i>the “aerosol effect” results from sneezing or coughing (beyond one meter)</i> , or by mechanical actions.	<i>Chicken Pox, Influenza, Measles, Tuberculosis, Pulmonary Anthrax.</i>
	WATERBORNE TRANSMISSION. Carried by bodies of water such as streams, ponds, swimming pools.	<i>Cholera, most forms of Diarrhea, Leptospirosis.</i>
	FOOD-BORNE TRANSMISSION. Pathogens grow on food due to poor handling, lack of refrigeration, careless processing, or undercooking; also true of unpasteurized milk. Ex: <i>poultry, seafood, meats.</i>	<i>Food poisoning, Hepatitis-A, Typhoid Fever, Trichinosis, Salmonellosis.</i>
3 VECTOR <i>Transmission</i>	BIOLOGICAL VECTOR. Usually arthropods, these serve as hosts that nourish and allow pathogens to multiply within them. The infectious agent is transmitted through bites. Ex: <i>mosquitoes, lice, bedbugs, fleas, ticks, mites, etc.</i>	<i>Dengue, Malaria, Plague, Typhus, Yellow Fever.</i>
	MECHANICAL VECTOR. These do not nourish the pathogen, but merely carry these in external body parts. Ex: <i>flies, roaches.</i>	<i>Salmonella, Shigella.</i>

5. Port of Entry. The port of entry is the route by which the pathogen enters the body of the new host. In principle, every port of exit is also a port of entry. Ports of entry vary, depending on the mode of transmission. It is at the port of entry that the pathogen first comes in *contact with mucous membranes or broken skin* of a new host.

- **Mucous Membrane Contact.** Infectious materials can be splashed on unprotected mucous membranes or may be inhaled into the lungs. This could include entry via the urinary or reproductive tract.
- **Ingestion.** Food, water, or even cigarettes can be contaminated and pathogens ingested.
- **Breaks in the Skin.** Insect vectors such as mosquitoes create breaks in the skin when they feed, allowing pathogens to pass through. Open wounds, cuts and sores are also potential ports of entry.

6. Susceptible Host. Not all hosts are can be infected by a particular pathogen. If the host's defenses are strong, the pathogen cannot cause disease. Factors such as age, genetics play a major role in resistance to infection. **Lifestyle factors** such as nutritional status, personal hygiene, and habitual stress levels are also significant. **Immunization** can help guard against pathogens.

Acute localized infections, at the very least, are subject to local contraindication. If the infection is systemic, as in influenza, the contraindication is also systemic, during the acute stage. Massage is applicable during the period of recovery.

Sneeze Velocity, Range, and Mucous Dispersion

EXPERIMENT No.1: Sneeze Velocity. Adam and Jamie used snuff to irritate their mucous membranes and force themselves to sneeze. Their findings:

- **Droplets from Adam's and Jamie's sneezes traveled at 35 mph (56 km/h) and 39 mph (63 km/h), respectively.**
- **Droplets from a sneeze can travel up to a distance of 30 ft (9.1 m).**

EXPERIMENT No.2: Sneeze Range. To get a visual indication of distance, Adam mixed cherry drink powder into the snuff and sneezed over a 30-foot-long strip of white paper. When this method failed to show any marks, he and Jamie tried drinking a small amount of food coloring just before sneezing. This idea worked, giving a maximum distance of 17 ft (5.2 m) for Adam and 13 ft (4.0 m) for Jamie. Nasal secretions from a person with a cold can spread so far and so quickly that anyone in the vicinity can become contaminated.

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- **Nasal secretions from a person with a cold can spread so far and so quickly that anyone in the vicinity can become contaminated.**

EXPERIMENT No.3: Mucous Dispersion. Adam and Jamie consulted with an otolaryngologist and learned that a person with a cold may secrete up to 60 milliliters of mucus per hour. Jamie built a rig from a syringe and tubing to match that drip rate with fluorescent dye, and Adam wore it by his nose as he did model-building work. After one hour, he and



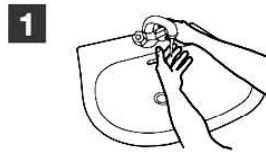
everything he had touched were stained with the dye. They then set up a party for Adam to host, with three "germaphobe" guests (Kari, Grant, and Tory, who were briefed to try to avoid contact with Adam) and three unsuspecting ones. Thirty minutes later, Adam, the whole table, and every guest except Kari – who admitted that she actually was a germaphobe – were heavily contaminated. In a second experiment in which Adam consciously did his best to avoid physical contact, all six guests came up clean.

Adam and Jamie declared the myth confirmed at this point, commenting that: **A healthy person would find it very difficult to avoid being contaminated by a sick one who did not attempt to keep from spreading his/her germs.**

Sanitation guidelines for massage therapists include the following:

a. Hand Washing and Antisepsis

Massage therapists are expected to wash their hands for 40-60 seconds, in the manner prescribed below.



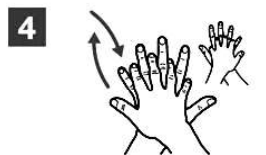
1 Wet hands with water;



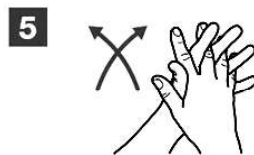
2 Apply enough soap to cover all hand surfaces;



3 Rub hands palm to palm;



4 Right palm over left dorsum with interlaced fingers and vice versa;



5 Palm to palm with fingers interlaced;



6 Backs of fingers to opposing palms with fingers interlocked;



7 Rotational rubbing of left thumb clasped in right palm and vice versa;



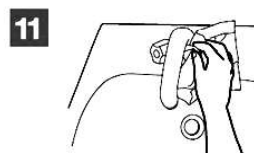
8 Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;



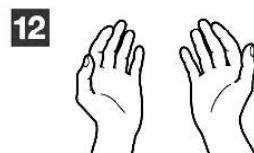
9 Rinse hands with water;



10 Dry hands thoroughly with a single use towel;



11 Use towel to turn off faucet;



12 Your hands are now safe.

Massage therapists must handwash frequently, especially on the following specific occasions:

- Upon arrival at the massage venue
- Before wearing gloves
- Before leaving the workplace.
- When gloves are seen torn or defective
- Whenever hands are visibly soiled
- After removing gloves.
- Before and after touching clients;
- Whenever hands come in contact with saliva, blood, or other body fluids.

Aside from soaps, massage therapists may avail of disinfectants and antiseptics to destroy harmful microorganisms. **Disinfectants** are used to kill bacteria on inanimate objects and surfaces, while **antiseptics** are used to kill bacteria on skin or living tissue.

Hand Sanitizers, also known as “antimicrobials”, are antiseptics. Sanitizers are now widely used in health facilities and homes as an alternative to soap. The correct method of sanitizing is shown here.



1 APPLY ENOUGH SANITIZER TO COMPLETELY COVER BOTH HANDS.

2 RUB HANDS TOGETHER, PALM TO PALM.

3 RUB BACK OF EACH HAND WITH PALM OF OTHER HAND.



4 SPREAD OVER AND UNDER FINGERNAILS.



5 SPREAD BETWEEN FINGERS.



6 KEEP RUBBING HANDS UNTIL DRY. DO NOT USE ANY TOWEL.

b. Use of Lotions

Frequent hand washing and use of antiseptic products can lead to dry, chapped hands which can provide easy entry for pathogens. Using **moisturizing hand lotions** can address hand dryness. Petroleum-based lotions and mineral oils should be avoided, since these can break down latex gloves and increase susceptibility to infection.

**c. No Jewelry, No Cosmetics**

It is not advisable to wear hand jewelry (like rings, bracelets, or wrist watches) while performing massage therapy because jewelry and trinkets have difficult to reach crevices and can become vehicles for micro-organisms. These and other sharp objects can cause breaks in the client's skin or other protective barriers. Necklaces, too, can be bothersome and distracting. **Cosmetics are unnecessary** and only serves as a superfluous distraction to the effective delivery of therapeutic massage. It is also useless when therapists are required to wear face masks. Heavy perfumes can conflict with aromatherapy. Hygiene and good grooming are sufficient.

d. Clipped Fingernails

Fingernails should be kept **clean, short, and without nail polish**. Long fingernails or cracked nail polish provide hiding places for microorganisms, thus violating sanitary standards. Long fingernails can also injure the client or cause breaks in the client's skin. Artificial nails pose a high risk for fungal infections which can be transmitted to the client.

**e. Clinical Hairstyle**

Health care delivery requires a simple, unsophisticated clinical hairstyle. Massage therapists must make sure that their hair is **uninfested, clean, and neatly fixed when on duty**. Hair must not distract the therapist from delivering the services required. It should never be necessary, at any time during treatment, for a therapist to have to fix her hair.

No strand of hair must cover any part of the eyes, ears, or neck. Long hair should be pig-tailed or bunned. The use of hair clips, nets, head bands, caps, or some other unobtrusive methods of keeping hair neat and in place is recommended.

f. Vaccination and Immunization

Massage therapists are considered high-risk for acquiring vaccine-preventable diseases. Thus, it is essential that a vaccination and immunization program be put in place to protect them. Some of the vaccine-preventable diseases that therapists may be exposed to during their work are (1) *Hepatitis-B*, (2) *Influenza*, (3) *Measles*, (4) *Mumps*, and (5) *Rubella*.

g. Use of Protective barriers

Personal protective equipment or gear provides a physical barrier between microorganisms and the massage therapist. These prevent the contamination of hands, eyes, clothing, hair and shoes in order to keep clients and staff safe. Personal protective gear are used when handling blood, body substances, excretions and secretions. Personal protective equipment may include: (1) *mask*, (2) *gloves*, (3) *cap*, (4) *gown/scrub-suits/uniforms*, and (5) *boots/shoe covers*. **Any unidentified substance must be treated as unsafe at all times.** Habitual and mandated use of protective gear for handling unsafe substances should be observed so as to avoid contamination.