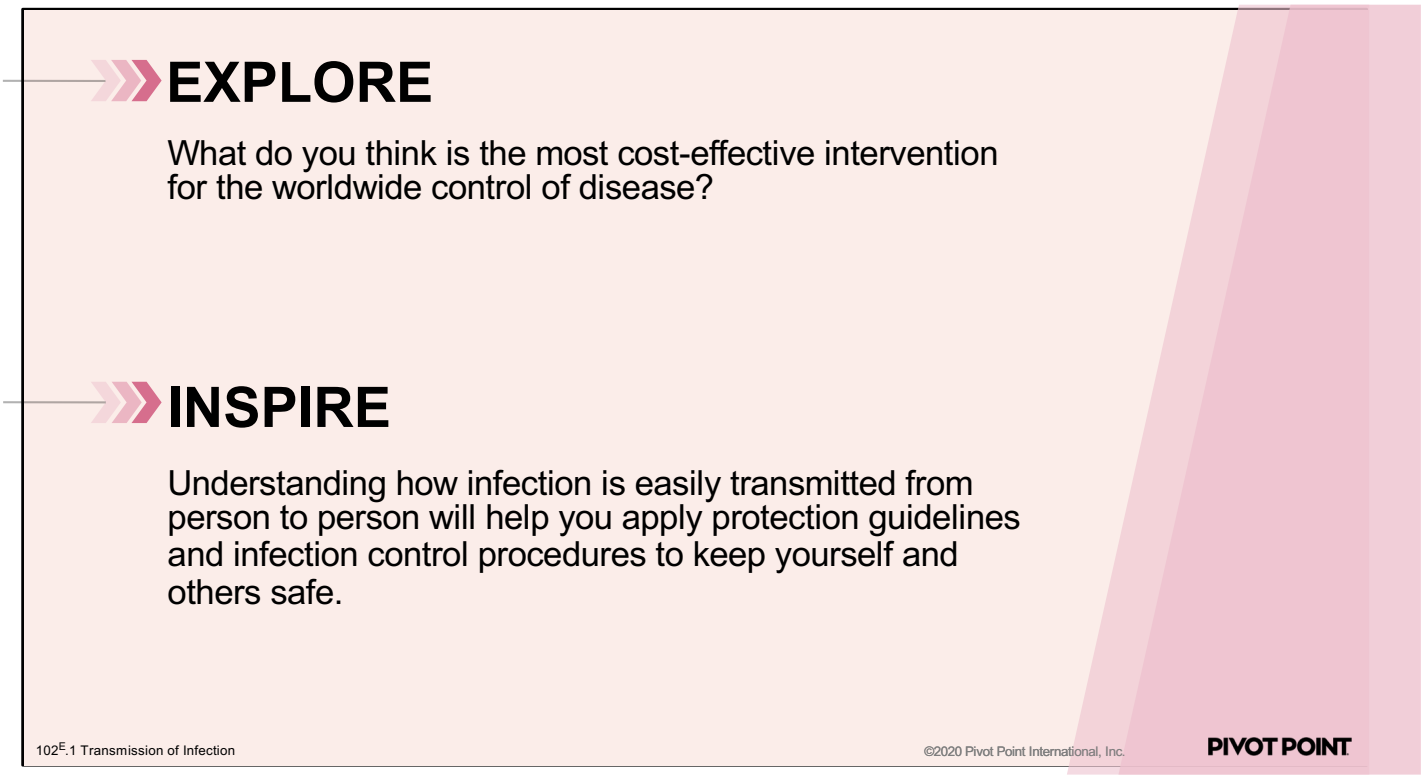
102E.1

TRANSMISSION OF INFECTION

- Types of Pathogens
- Ways to Transmit Infection

This lesson focuses on *Transmission of Infection*:

- Types of Pathogens
- Ways to Transmit Infection

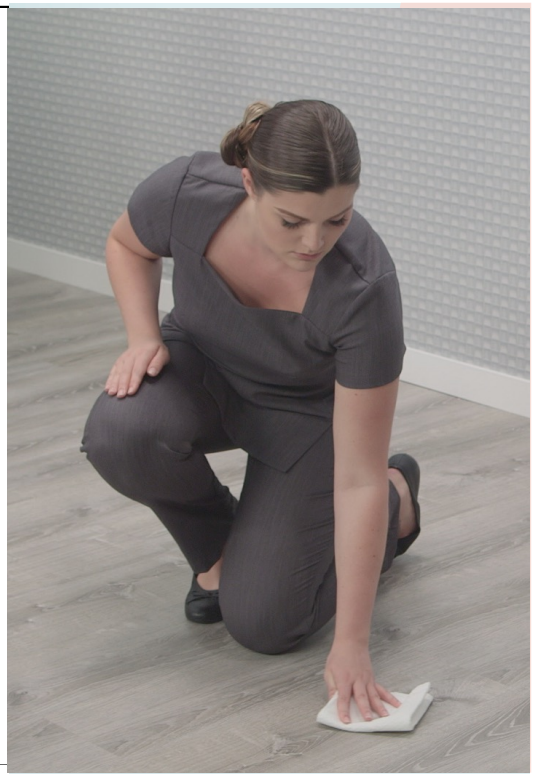


Explore
What do you think is the most cost-effective intervention for the worldwide control of disease?

Inspire
Understanding how infection is easily transmitted from person to person will help you apply protection guidelines and infection control procedures to keep yourself and others safe.

What will I achieve?

- Define the types of pathogens that could be found within the salon/spa environment
- Describe the ways infection can be transmitted within the salon/spa environment

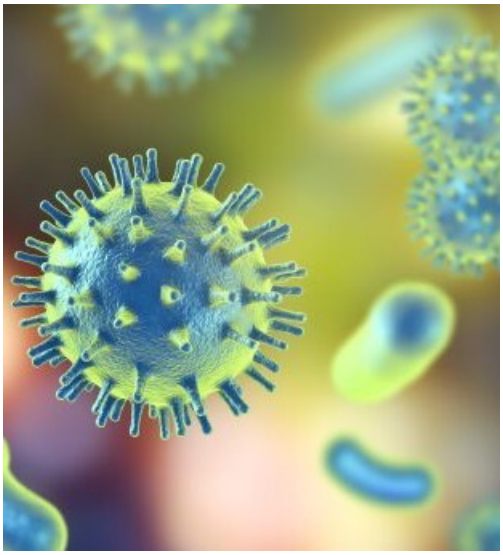


Following this lesson, you'll be able to:

- Define the types of pathogens that could be found within the salon/spa environment
- Describe the ways infection can be transmitted within the salon/spa environment

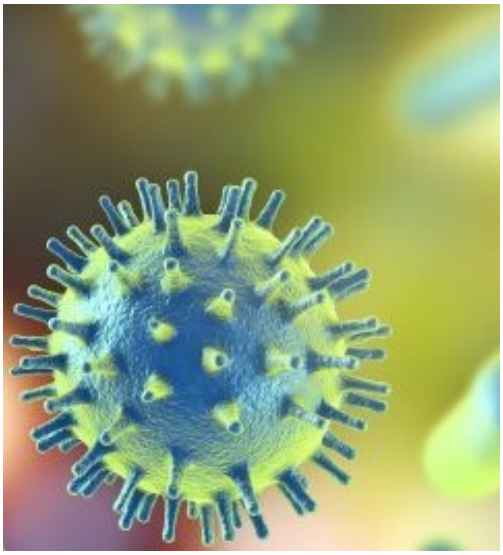
Infection is commonly transmitted through direct person-to-person contact and, most often, through hand-to-hand contact. That's why handwashing is the most cost-effective intervention for worldwide disease control and one of the most important ways to prevent the transmission of infection.

TYPES OF PATHOGENS



- **Antibodies** – Produced by the immune system in response to any pathogen. They can either destroy, kill or inactivate pathogens.
- **Antitoxins** – Special group or type of antibodies that render a toxic substance harmless. They can neutralize a specific toxin.

TYPES OF PATHOGENS



- Bacteria
- Viruses
- External Parasites
- Fungi
- Biofilm

Different diseases are caused by different types of micro-organisms. The micro-organisms that cause disease are called **pathogens** (germs). The five types of pathogens that can be potentially harmful include:

- Bacteria
- Viruses
- External parasites
- Fungi
- Biofilm

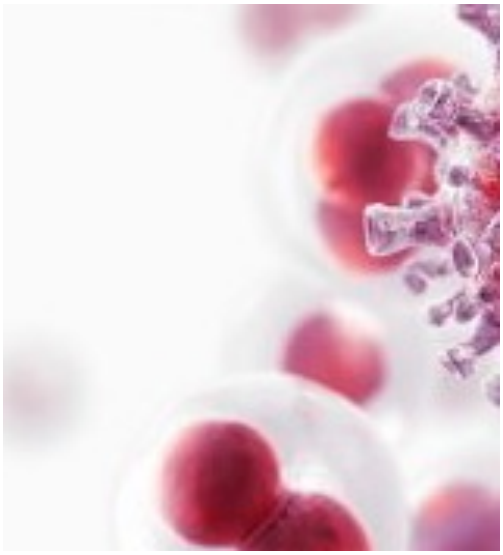
TYPES OF PATHOGENS

BACTERIA

- One-celled micro-organisms

- Sometimes called germs
- Grow best in places that are warm, dark or dirty
- Two categories:
    - **Nonpathogenic** (non-disease producing)
    - **Pathogenic** (disease producing)

TYPES OF PATHOGENS



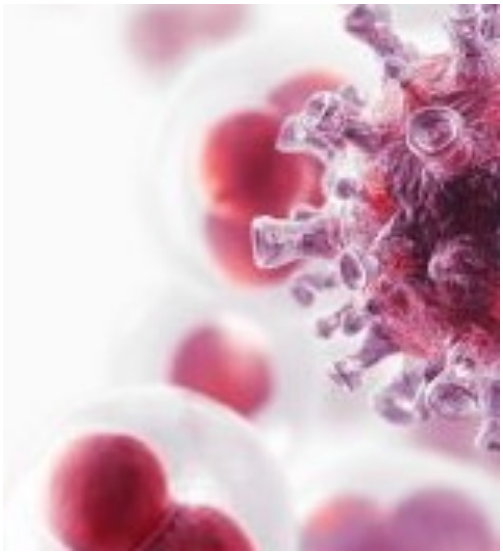
BACTERIA: Nonpathogenic

- Non-disease producing

Nonpathogenic (non-disease producing)

- Harmless and can be very beneficial
- Approximately 70% of all bacteria
- Many live on the surface of the skin
- Have properties that are health-enhancing
- Cause decay of refuse or vegetation
- **Saprophytes** are a type of nonpathogenic bacteria that live on dead or decaying organic matter

TYPES OF PATHOGENS



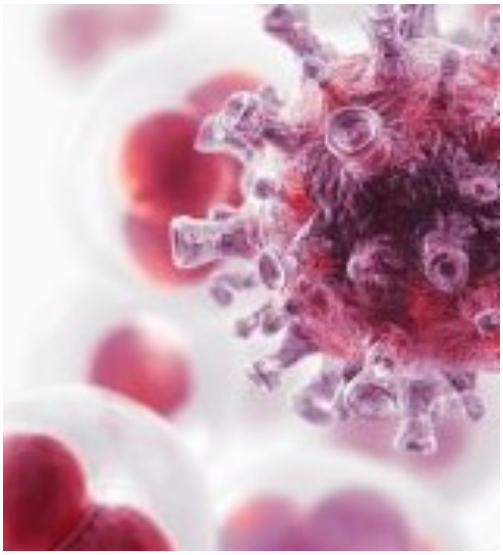
BACTERIA: Pathogenic

- Disease-producing

Pathogenic (disease-producing)

- Can cause disease
- Live everywhere in the environment
- Some cause infection and disease
- Some produce toxins (poisons)
- Can spread easily via contaminated implements or dirty hands and fingernails

TYPES OF PATHOGENS



BACTERIA: Pathogenic

- When a disease spreads from one person to another via contact, it's referred to as **contagious** or **communicable**

- When a disease spreads from one person to another via contact, it's referred to as **contagious** or **communicable**.
- Wash your hands before and after a treatment to prevent the spread of pathogens

Examples:
Strep throat, staph infection, impetigo

- Bacteria causes infection by invading the body through a break in the skin or through any of the body's natural openings (nose, mouth, eyes, ears or genitals).
- An infection occurs when insufficient numbers of antibodies are produced by the immune system to "fight" harmful bacteria.
- Majority of skin infections are caused by staph or strep bacteria.
- Problems such as skin infections could be considered a **contraindication** (reason for withholding a particular treatment).

TYPES OF PATHOGENS

BACTERIA: Pathogenic

- MRSA (Methicillin-Resistant *Staphylococcus aureus*)
- Mycobacterium

MRSA

- Highly contagious
- Enters the skin through open wounds
- Can cause serious staph infections
- May initially appear as pimples or boils
- Resistant to most antibiotics
- Many infected people do not show symptoms
- Disinfection procedures are required to reduce exposure and protect clients

Mycobacterium

- Contagious bacteria often found in water and soil
- Typically found in water, including tap water treated with chlorine
- Avoid having cracked, dry skin to prevent pathogens from entering body
- Sinks, pedicure bowls and areas using water source require careful methods of infection control

TYPES OF PATHOGENS

VIRUSES

- Smaller than bacteria

Viruses

- Submicroscopic infectious particle
- Smaller than bacteria
- Examples include common cold, flu, chickenpox, mumps, measles, rabies, HIV, hepatitis
- Require a living host to multiply, otherwise they can't survive
- Not treatable with antibiotics
- Invade cells and redirect to produce more virus
- Symptoms appear within 10-14 days of exposure
- Vaccinations can be a preventative measure for certain viruses

TYPES OF PATHOGENS

VIRUSES: Viral Infections

- Hepatitis A, B and C Virus (HAV) (HBV) (HCV)
- Herpes Simplex Virus 1 and 2 (HSV-1 and HSV-2)
- Human Immunodeficiency Virus (HIV)
- Human Papillomavirus (HPV)

Viral infections that are more general to the whole body include:

- Hepatitis A Virus (HAV)
  - Transmitted by person to person contact or consumption of contaminated food/water
  - Vaccine-preventable
- Hepatitis B (HBV) and C Virus (HCV)
  - Bloodborne pathogen that causes a highly infectious diseases affecting the liver
  - Hepatitis B is a vaccine-preventable disease; immunization is often recommended for personal service workers
- Herpes Simplex Virus 1 and 2 (HSV-1 and HSV-2)
  - Most common viruses that an esthetician must be aware of
  - Can show up as a cold sore or as a sexually transmitted disease
- Human Immunodeficiency Virus (HIV)
  - Virus that can lead to Acquired Immunodeficiency Syndrome (AIDS)
  - Attacks and destroys the infection-fighting cells of the immune system
  - Infectious fluids can enter the body through childbirth, cuts, sores, sexual intercourse, sharing needles or syringes
- Human Papillomavirus (HPV)
  - Only known cause of cervical cancer

- Virus can lead to health problems such as genital warts, plantar warts, cervical changes
- Vaccine preventable

TYPES OF PATHOGENS

PARASITES

- Parasitic mites – Insects that cause contagious diseases
  - Itch mites (scabies)
  - Head lice (pediculosis capitis)
- Highly contagious

External parasites – Obtain their nutrients from another organism called a host
Parasitic mites – Insects that cause contagious diseases; infestations can cause severe skin problems with secondary bacterial infections due to scratching

- Scabies
  - Extremely itchy condition caused by itch mites
  - Itch mites burrow under the skin – Commonly found between fingers and toes
  - Looks like red rash with blisters and pimples
  - Need skin-to-skin contact to spread
  - Rarely transfers via clothing or towels
  - Needs to be treated by a physician
- Head lice (pediculosis capitis)
  - Transmitted from person to person or via articles coming in contact with infested person such as towels or headbands
  - Usually found at the base of neck or back of ears
  - Usually accompanied by head scratching, redness and/or small bite marks
  - Easily controlled with pediculicide shampoo
  - Cannot live off human body for more that 48 hours

TYPES OF PATHOGENS

FUNGI

All types of molds and yeast, some of which may produce contagious diseases

- Ringworm (tinea)
  - Ringworm of the scalp (tinea capitis)
  - Honeycomb ringworm (favus)
- Mildew (doesn't cause human infection)

Fungi: Molds and yeasts that produce contagious diseases

Ringworm
- Highly contagious
- Appears as red round patches that create circles then scales and pustules
- Causes itchiness
- Can present itself anywhere on the body
- Feeds off dead skin and can easily spread by using other people's towels or facecloths

Mildew
- Fungus that doesn't cause human infections but can harm plants or surfaces such as sinks and towel bins

Professionals prevent the spread of contagions (mites and fungi) through proper disinfection procedures.

TYPES OF PATHOGENS

BIOFILM

- Type of slime created when a bacterial colony and water are present

Biofilm is a type of slime created when a bacterial colony and water are present.

- The sticky nature of the colony adds to its growth and difficulty to remove.
- Infection control procedures in the workplace are critical because biofilm is not easily visible.

Example is slime buildup around a drain.

WAYS TO TRANSMIT INFECTION

Six signs of infection

- Pain
- Swelling
- Redness
- Local fever
- Throbbing
- Discharge

102E.1 Transmission of Infection

PIVOT POINT

An infection occurs when disease-causing (pathogenic) bacteria or viruses enter the body and multiply to the point of interfering with the body's normal state.

- Pathogens move from one person to another or from an object to a person via a process called transmission
- Ways to transmit infection include direct or indirect contact

Six signs of infection

- Pain
- Swelling
- Redness
- Local fever
- Throbbing
- Discharge

WAYS TO TRANSMIT INFECTION

DIRECT TRANSMISSION

- Person-to-Person contact
- Ways to transmit
  - Direct contact
  - Respiratory droplet transmission

102E.1 Transmission of Infection

PIVOT POINT

Person-to-Person Contact

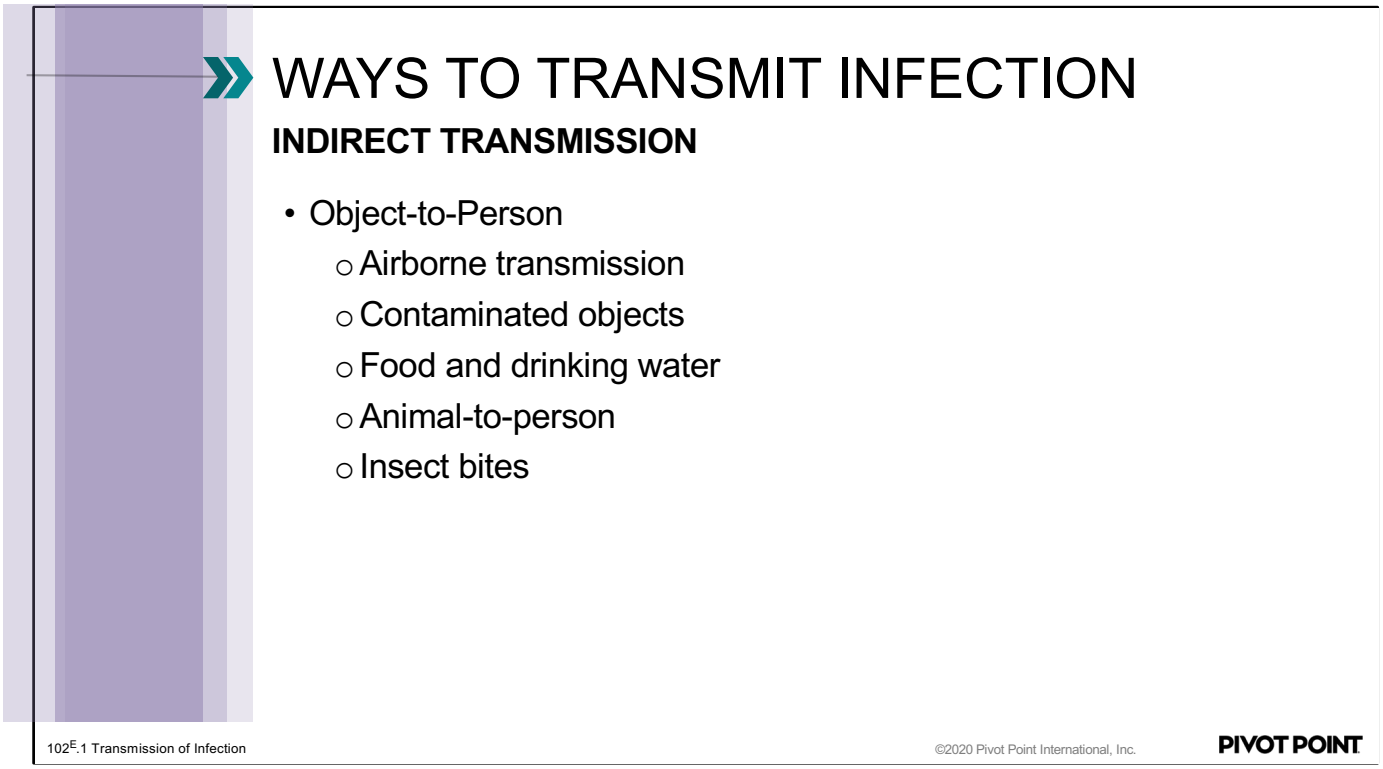
- Infected person exchanges pathogens with another person through direct contact

Examples

- Warts
- Pink eye
- Influenza

Way to transmit infection

- Direct Contact
  - Skin-to-skin contact with and infected person
- Respiratory Droplet transmission
  - Spray of large droplets when close to someone while coughing, sneezing or talking



Indirect transmission is spread through air or contact with a contaminated object such as a countertop.

Examples:

- Ringworm
- MRSA
- *E. coli*

Ways to transmit infection

- Airborne – Contact with tiny droplets
    - Droplets can travel long distances and remain suspended in the air for an extended time
- Contaminated objects – Contact with an organism that can live on an object for a short time
    - Happens when you touch the object and then touch your eyes, nose or mouth before washing your hands
- Food and drinking water – Through food or water that is contaminated
- Other examples include animal-to-person contact or insect bites

WAYS TO TRANSMIT INFECTION

INDIRECT TRANSMISSION

Common means of spreading infection in the workplace:

- Open sores
- Unclean hands and implements
- Coughing or sneezing
- Shared use of drinking cups and towels
- Use of same implements on infected and noninfected areas
- Use of facial treatment tables and tools not properly disinfected between clients
- Unsanitary workplace conditions

102E.1 Transmission of Infection

PIVOT POINT

Ways infection can spread:

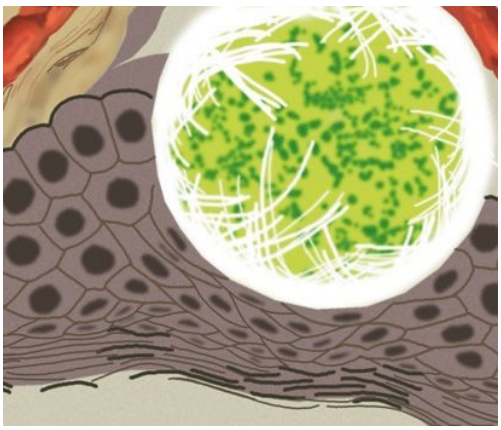
- Open sores
- Unclean hands and implements
- Coughing or sneezing
- Common use of drinking cups and towels
- Use of same implements on infected and noninfected areas
- Unsanitary shop conditions

Infection can be controlled by:

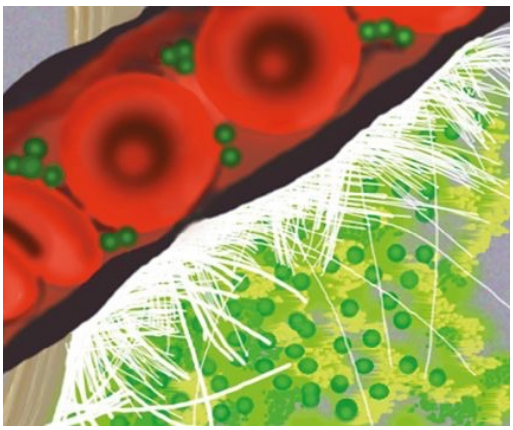
- Personal hygiene
- Public awareness
- Infection control procedures
- Vaccinations

WAYS TO TRANSMIT INFECTION

INDIRECT TRANSMISSION



Local



General or systemic

102E.1 Transmission of Infection

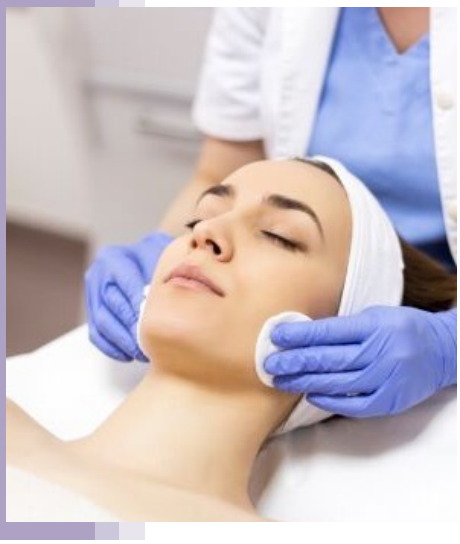
PIVOT POINT

Two basic classes of infection:

- Local
  - Located in a small, confined area
  - Pus-filled boil or inflamed area
- General
  - Whole body
  - Systemic
  - Occurs when circulatory system carries bacteria and their toxins to all parts of the body

WAYS TO TRANSMIT INFECTION

STANDARD PRECAUTIONS



Practice of using the same infection control procedures with all clients

Examples include:

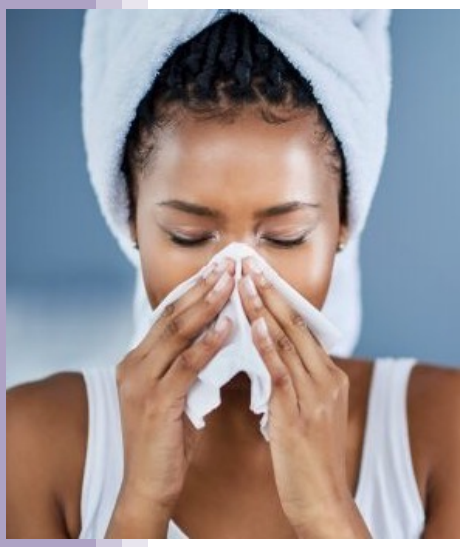
- Properly disinfecting tools, implements and equipment
- Handwashing
- Wearing personal protective equipment (PPE)

Asymptomatic carrier – Carries disease-producing bacteria or viruses with no recognizable symptoms of the disease.

Standard Precautions

- Practice of using the same infection control procedures with all client. Examples include:
    - Properly disinfecting tools, implements and equipment
    - Handwashing
    - Wearing personal protective equipment (PPE)
- Must be used with
    - Blood
    - All body fluids, secretions and excretions except sweat
    - Mucus membranes and their secretions
    - Broken skin

WAYS TO TRANSMIT INFECTION



IMMUNITY

- Body's ability to destroy infectious agents that enter the body
- Two types of immunity:
  - Active
  - Passive

Active
- Antibodies produced after exposure to disease
- Disease exposure through infection with actual disease or vaccination
- Takes time to develop
- Long-lasting and sometimes lifelong

Passive
- Antibodies given vs. producing through the immune system
- Person can also get through antibody-containing blood products
- Protection is immediate
- Lasts only a few weeks or months

CHECK WHAT YOU KNOW

1. TRUE/FALSE Bacteria are one-celled micro-organisms.
2. TRUE/FALSE Pathogenic bacteria are harmless and can even be beneficial.
3. A special group or type of antibodies which render a toxic substance harmless are known as _____.
4. A disease that spreads from one person to another via contact is referred to as contagious or _____.
5. Certain viruses can be prevented by _____.

Check What You Know questions help affirm understanding of key points.

CHECK WHAT YOU KNOW

6. Sub-microscopic particles that cause familiar diseases like the common cold are referred to as _____.
7. An organism that lives on or obtains nutrients from another organism (host) is called an external _____.
8. An infection that is located in a small, confined area is known as a _____ _____.
9. The practice of using the same infection control procedures with all clients is called _____ _____.
10. The body's ability to destroy infectious agents that enter the body is referred to as_____.

Check What You Know questions help affirm understanding of key points.

CHECK WHAT YOU KNOW

1. TRUE/FALSE Bacteria are one-celled micro-organisms. Page 4
2. TRUE/FALSE Pathogenic bacteria are harmless and can even be beneficial. Page 4
3. A special group or type of antibodies which render a toxic substance harmless are known as antitoxins. Page 4
4. A disease that spreads from one person to another via contact is referred to as contagious or communicable. Page 4
5. Certain viruses can be prevented by vaccination. Page 6

Check What You Know questions help affirm understanding of key points.

CHECK WHAT YOU KNOW

6. Sub-microscopic particles that cause familiar diseases like the common cold are referred to as viruses. Page 6
7. An organism that lives on or obtains nutrients from another organism (host) is called an external parasite. Page 8
8. An infection that is located in a small, confined area is known as a local infection. Page 12
9. The practice of using the same infection control procedures with all clients is called standard precautions. Page 12
10. The body's ability to destroy infectious agents that enter the body is referred to as immunity. Page 13

Check What You Know questions help affirm understanding of key points.

102E.1 TRANSMISSION OF INFECTION REVIEW

TYPES OF PATHOGENS

The types of pathogens that could be found within the salon/spa environment include:

- Bacteria
- Viruses
- External parasites
- Fungi
- Biofilm

Validate learning by celebrating what has been learned.

102E.1 TRANSMISSION OF INFECTION REVIEW

WAYS TO TRANSMIT INFECTION

The way infection is transmitted within the salon/spa environment include:

- Direct contact
- Indirect contact

Validate learning by celebrating what has been learned.

PIVOT POINT FUNDAMENTALS: ESTHETICS