Objectives & Chain of Transmission

Objectives

To understand:

- The different resources available for infection prevention and control.
- How germs are spread by learning about The Chain of Transmission.
- How to prevent the spread germs by using Routine Practices (i.e., hand hygiene and appropriate use of Personal Protective Equipment).
- Principles of environmental cleaning and disinfection.

What is Infection Prevention and Control?

Infection Prevention and Control (also known as IPAC) is practices and procedures that can prevent or reduce the spread of germs.



Why is IPAC Important?

- Infections can happen anywhere (schools, daycares, workplaces, on the subway), but the clients that you're working with are generally more vulnerable.
 - e.g., crowded living conditions, decreased access to healthcare which can translate to missed opportunities for vaccinations, limited opportunities to maintain personal hygiene and nutrition.
- Engaging in good infection control practices like keeping your hands clean and being up to date with your immunizations can help protect yourself, your clients and your loved ones from infections.



Resources - Infection Prevention & Control Guide for Homelessness Service Settings



Infection Prevention and Control Guide for Homelessness Service Settings Includes:

- Routine Practices
- Client Hygiene
- Food Safety
- Environmental Guidelines
- Communicable Disease Outbreaks
- Occupational Health & Safety
- Practical Tools (e.g., Bathroom Cleaning/Disinfection Checklist)

Resources - Infection Prevention & Control Resources for Homelessness Service Settings Webpage

Infection Prevention and Control in Homelessness Service Settings

Room Cleaning/Disinfecting Checklist

- $\langle \rangle$
- $\ensuremath{\textcircled{O}}$ Gather cleaning and disinfection supplies, make sure everything is clean.
- O Choose/prepare appropriate cleaning and disinfectant product(s) for where you are going to clean. Make sure you know how to safely use the product(s).
- Clean hands and put on gloves.
- If bedding has been used, remove and place into a laundry bag for dirty linens
 Remove gloves, clean hands, and put on new gloves.
- \oslash Clean and disinfect the following, from clean to dirty areas:
 - Thermostat and wall-mounted items
 - · High-touch surfaces including door handles, hand rails and light switches
 - Furnishings and flat surfaces in the room (that are non-absorbent)
 - Beds, from the foot of the bed to the head of the bed. Make sure to clean:
 The top, sides and underside of the mattresses. Check for cracks, holes and pests.
 - Bedrails and all parts of the bed frame.
- S Clean the following, from clean to dirty areas:
 - · Walls if visibly soiled
 - Mirrors, windows and glass door panels (use glass cleaner)
 - Floors

Note: If using a bucket and cloths, do not 'double-dip' the cloths in the bucket. Change the cloth after cleaning very dirty areas.



Link to Webpage

- The webpage includes a number of tools, for example:
 - PDF Version of the Guide
 - Bathroom Cleaning and Disinfection Checklist
 - "Be Careful with Needles" poster
 - Cleaning Up Blood and Body Fluids Checklist
 - Linen and Laundry Tips
 - Putting on and Taking Off Gloves

Additional Resources

- The Toronto Hostels Training Centre (THTC) module on <u>Communicable</u> <u>Diseases</u>, which includes information on:
 - SMIS Alerts
 - Chain of Transmission and IPAC
 - Hand Hygiene/PPE
 - ► TB
 - Sexually Transmitted Infections
 - Harm Reduction/Overdose

- Best practice documents from the Provincial Infectious Disease Advisory Committee, including:
 - Infection Prevention and Control for Clinical Office Practice
 - Hand Hygiene in All Healthcare Settings
 - Environmental Cleaning for Prevention and Control of Infections in All Health Care Settings
 - Guide to Infection Prevention and Control in Personal Service Settings
- These documents are intended for healthcare settings or personal service settings, but they include information and guidance that is relevant for homelessness service settings

Chain of Transmission - How Germs are Spread



Infectious Agent - The Germ

The first component of the chain of transmission is the infectious agent, which is also known as a germ.

- There are many different types of germs, including:
 - Viruses (e.g., Influenza, Hepatitis A/B/C, HIV)
 - Bacteria (e.g., Mycobacterium tuberculosis)
 - Parasites (e.g., Giardia)
 - Fungi (e.g., Trichophyton, a cause of ringworm)



Breaking the Chain Infectious Agent- The Germ

- Getting vaccinated is a great way to protect yourself from getting infected with germs. Examples of immunizations include:
 - Hepatitis A
 - ► Hepatitis B
 - Influenza
 - Tetanus
 - Meningococcal Disease



Another way to get rid of a germ is to receive appropriate medical care and treatment.

Publicly Funded Immunization Schedule in Ontario



Reservoir - Where the Germ Hides

- Reservoirs are where germs live, grow, and multiply. For example,
 - In people (e.g., in blood)
 - On your body (e.g., on hands)
 - In animals
 - In water
 - In food
 - On surfaces (e.g., toilet, doorknobs)
- Human and animal reservoirs may not always appear to be sick, but may still be capable of spreading germs.



Breaking the Chain Reservoir (Where the Germ Hides)

Cleaning/Disinfection Hand Hygiene

Food Safety







Portal of Exit - The Way Out

- Germs have to leave their reservoirs in order to cause illness in another person. Germs can leave their reservoir by:
 - Coughing
 - Sneezing
 - Bleeding
 - Urinating
 - Defecating
 - Vomiting
 - Touching
 - Draining Wounds
 - Other body secretions (e.g., semen)



Breaking the Chain Portal of Exit (The Way Out)

- Covering open wounds and considering providing masks to clients with respiratory symptoms if feasible/accessible
- Managing fecal incontinence and vomiting
- Respiratory Etiquette (Cover your Cough)
 - Cover your mouth and nose when you cough, sneeze or blow your nose and put used tissues in the garbage.
 - If you don't have a tissue, cough or sneeze into your sleeve, not in your hands.
 - Make sure to clean your hands after!



Mode of Transmission - Getting Around

- The mode of transmission is the way that germs have to travel from their reservoirs in order to infect another person. The different modes of transmission are:
 - Contact
 - Direct
 - Indirect
 - Droplet
 - Airborne
 - Vehicle
 - Vectorborne



Mode of Transmission – Contact

Direct contact - transmission by person-to-person contact



Let's say someone sneezes into their hands, does not clean their hands after, and then shakes the hand of another person. If the second person touches their eyes, nose, or mouth, the germ from the first person's hands can enter the second person's body and make them sick.

Mode of Transmission – Contact

Indirect contact - transmission by touching a contaminated object.



Indirect contact happens when a germ is transferred from a person to another person through a contaminated object. In this example, the walkie-talkie is the contaminated object.

Mode of Transmission - Droplet

- Droplet transmission that occurs when large droplets exit the respiratory tract of someone when they talk, cough, or sneeze and enter another person's eyes, mouth, or nose.
 - Droplets can spread up to 2 meters.
 - Some germs that are spread through droplets can fall from the air, and can land on and contaminate surfaces.



Mode of Transmission - Airborne

Airborne- transmission that occurs when tiny droplets exit the respiratory tract of a person, remain suspended in the air, and are inhaled by another person







Tiny viral or bacterial particles remain in the air



Examples of germs that are spread by airborne transmission are chickenpox, measles, and tuberculosis. Generally, tuberculosis is spread only when someone has prolonged close contact with someone that has active TB disease.

Mode of Transmission-Airborne

- If you suspect that a client has active tuberculosis (e.g., symptoms such as a prolonged/worsening cough, night sweats, significant weight loss, coughing up blood), ensure the client seeks medical care as soon as possible.
 - If the client refuses to seek medical care, you can contact the TB team at Toronto Public Health and someone will come out to assess the client.
 - ▶ The TB Program can be reached at 416-392-7457 or targettb@toronto.ca

 There are effective immunizations for some airborne diseases (e.g., chickenpox, measles)



Mode of Transmission - Vehicle

Vehicle - transmission of a germ through a common contaminated item



Contaminated food/water/personal hygiene supplies



Needle stick injury

Mode of Transmission - Vector

- Vectorborne transmission that occurs when a person is bitten by an insect (e.g., mosquito, tick, or flea) carrying a germ.
- Note: Bites from bedbugs, scabies, and lice do not generally spread germs. Instead, their itchy bites can cause people to scratch to the point where there are breaks in their skin where germs can enter.



Breaking the Chain-Mode of Transmission

- Hand hygiene
- Environmental cleaning & disinfection
- Respiratory etiquette
- Safe handling and disposal of sharps
- Personal protective equipment (e.g., gloves)
- Food safety
- Immunizations
- Spatial separation
- Ensuring client belongings are stored separately
- Discouraging sharing of hygiene items, drug equipment, etc.



Portal of Entry - The Way In

- Germs have to have a way into a host in order to make someone sick.
 Germs can enter a person through:
 - Eyes
 - Mouth
 - Nose
 - Wounds



Breaking the Chain Portal of Entry (The Way In)

- Cover open wounds
- Perform hand hygiene before touching your face
- Wear PPE (e.g., gloves, masks) when appropriate
- Handle needles and other sharp objects safely
- Avoid sharing items that could cause nicks or cuts (e.g., razors, nail clippers)

These are all ways that you can limit or prevent opportunities for germs to enter your portals of entry.

Susceptible Host - Next Sick Person

- Just because you are exposed to a germ does not mean that you will always get sick. Factors that can increase your risk of getting sick:
 - Age (very young or very old)
 - Immune system
 - Stress
 - Underlying illness
 - Lack of sleep
 - Poor nutrition
 - Lack of vaccination
 - Open wounds



Breaking the Chain - Susceptible Host

Immunization

- Getting immunized against diseases can prevent germs that you are exposed to from causing illness.
- If you have questions about vaccinations, call Toronto Public Health at 416-338-7600 and ask to speak with a nurse in the Vaccine Preventable Disease Program.

Adequate nutrition and sleep

- Making sure you and your clients are eating regular healthy meals and getting enough sleep can enhance your immune system to make you less susceptible to diseases.
- Treating underlying medical conditions (e.g., diabetes)
 - Treating medical conditions that can decrease your immune system is an important way to decrease susceptibility to infections.

Case Study #1 - Chain of Transmission

- Steve and Sylvester are two clients who use your site and they spend a lot of time together.
- Steve has an infestation of body lice. He does not shower regularly an has been scratching his skin a lot. His constant scratching has led to a number of open wounds on his body.
- Sylvester has strep throat (caused by Group A strep) and has been coughing a lot over the past few days.
- Soon, one of the wounds on Steve's hand becomes infected with Group A strep.

Thinking about the "Chain of Transmission", what are some ways that Steve's wound infection could have been prevented?

Case Study #1 Answers- Chain of Transmission

- Once staff noticed that Sylvester was ill, they could have encouraged him to seek medical care and treatment (Agent).
- If Steve had been treated for lice, he would not have had open wounds (Agent).
- If Sylvester had coughed into his elbow, his respiratory droplets would have been contained and not reached Steve's wounds (Portal of Exit, Mode of Transmission).
- If appropriate, staff could have provided Sylvester with masks until he was no longer contagious (Portal of Exit)
- If Steve's wounds were covered, Group A strep would not have entered his wounds (Portal of Entry).
- If staff had encouraged Steve to shower more regularly, he would be less susceptible to body lice and wound infections (Susceptible Host).



Case Study #1a - Chain of Transmission Family Shelters

- Bill, a child staying at your site, has not been feeling well over the past few days. His mom, Betty, drops him off in the playroom so that he can see his friends.
- During story time, all of the children sit close together on the carpet. Bill is coughing so much that it is hard for the other kids to hear the story.
- At snack time, Bill is in charge of handing out the apples to the other children.
- A few days later, several of the other children that visit the playroom get sick.

Thinking about the "Chain of Transmission", what are some ways that this



Case Study #1a Answers - Chain of Transmission - Family Shelters

- If Betty had taken Bill to seek healthcare when he started feeling sick, he may have been able to start treatment and he would not have exposed the other children in the playroom (Agent)
- If Bill had been taught about respiratory etiquette, his droplets would not have gotten into the air for the other children to breathe in (Mode of Transmission, Portal of Exit)
- If Bill had washed his hands before handing out the snacks, the germs on his hands would not have contaminated the apples. Additionally, as Bill was sick, another child should have been selected to hand out the snacks (Mode of Transmission)



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