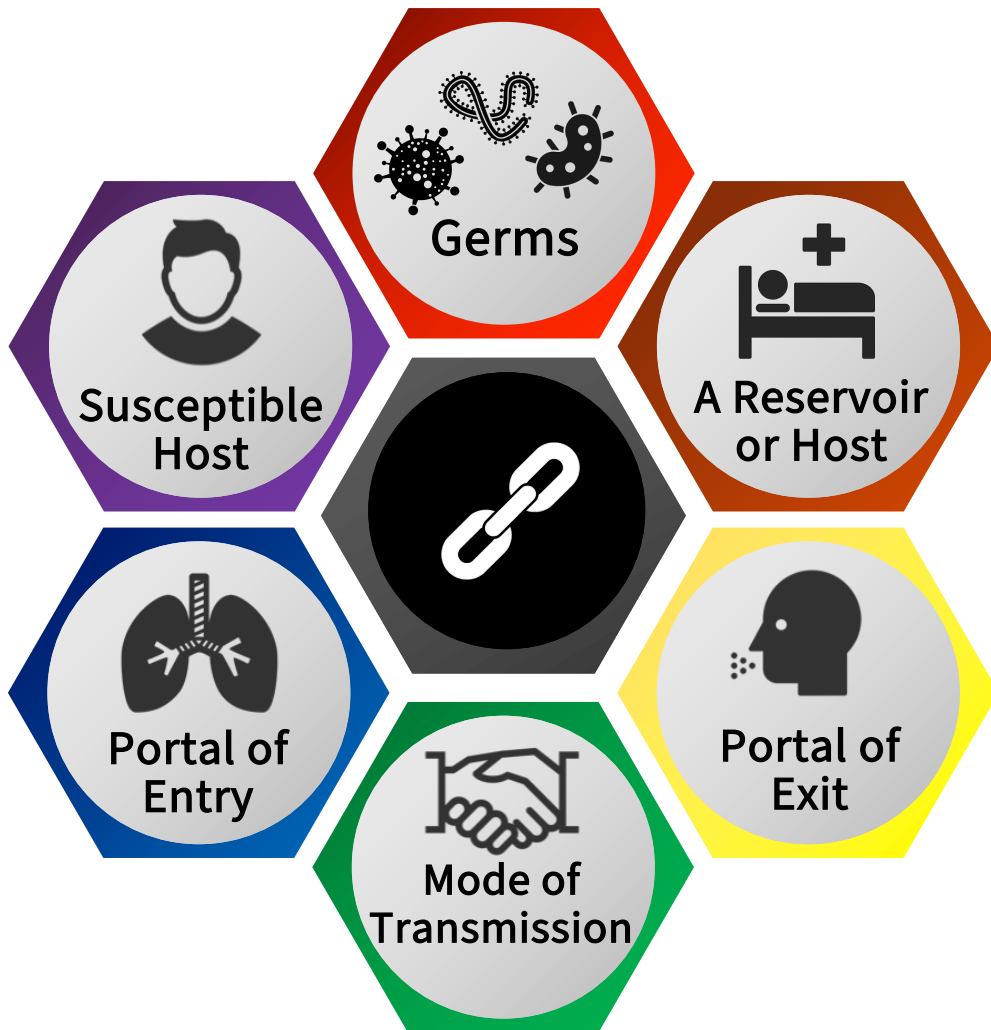


The Chain of Infection and

How to Use it to Prevent the Spread of Infection in LTC



- The chain of infection is the process a pathogen follows to cause disease.
- This diagram displays the process and shows how there are 6 opportunities to break the chain to halt or control the spread of infection.
- Understanding how the chain of infection can be broken will help protect you, other staff, your residents and your contacts.

The Chain of Infection and

How to Use it to Prevent the Spread of Infection in LTC




The chain of infection begins  with the presence of germs

- ✓ Germs are microscopic organisms that can be found almost everywhere:
 - Air
 - Soil
 - Plants
 - Animals
 - Water
- ✓ Bacteria, viruses, fungi, and protozoa are all types of germs.
- ✓ Some germs do us no harm, but others can make us sick and even cause death.
- ✓ Some germs cause infection for which we have no vaccine or treatments. This makes it especially important to break the chain of infection.


Examples of infections caused by each type of germ

BACTERIA



- C-diff
- Anthrax
- Botulism
- Plague
- Methicillin-resistant staphylococcus aureus (MRSA)

VIRUSES



- COVID-19
- Smallpox
- Ebola
- Rabies
- Norovirus

FUNGI



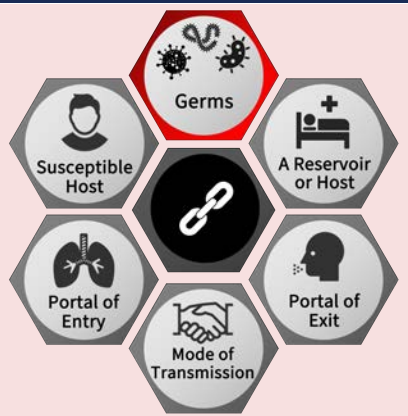
- Candida Auris
- Histoplasmosis
- Ringworm
- Cryptococcus
- Aspergillus

**PROTOZOA
(PARASITES)**



- Malaria
- Giardia
- Toxoplasmosis
- Hookworm
- Amoebic dysentery

The Chain of Infection and How to Use it to Prevent the Spread of Infection in LTC



How germs become present in your facility

There are many ways germs can enter your facility - some common ways are:

- ✓ In staff, visitors and vendors who are sick.
- ✓ On staff, visitors, and vendors who have touched something that was contaminated with the germs before entering the facility, such as a doorknob, gas pump, or grocery cart.
- ✓ Residents can also introduce germs into facilities For example, a resident who is put on antibiotics and then develops C-diff that can lead to an outbreak.

How to prevent germs from entering the facility

- If you are sick, stay home from work and seek medical treatment if needed.
- Ensure that everyone performs proper hand hygiene before entering the facility.
- Screen staff, visitors, and vendors for signs and symptoms of infection. If they have any signs or symptoms, they should not be allowed access.
- Know what items coming into the facility may carry germs to exclude or disinfect them.
- If there is an outbreak that is contagious before symptoms appear, use source control measures. For example, wearing masks, handwashing, and implementing physical distance strategies.
- Conduct disease surveillance for early recognition of an infection in residents to prevent an outbreak of e.g., C-diff or norovirus.
- Stay informed on current risks and what needs to be done to prevent an infectious outbreak in the facility.

The Chain of Infection and

How to Use it to Prevent the Spread of Infection in LTC



The next link → Reservoir or Host

- Reservoir** → A reservoir is the habitat where germs can live, thrive, and multiply without causing harm or illness and in some cases are helpful.
- Host** → A host gets infected by germs and can become sick.
- Example** → Ebola virus can live in bats without causing them any harm, but a human infected with the Ebola virus will become very sick and may die.

What are potential reservoirs or hosts in a LTC facility?

Reservoir

- The nests of wild animals or birds on the premises where e.g., influenza A virus can be present.
- Pools of water. For example, pseudomonas can be found in ice machines, leaky pipes, and sinks.
- Unsanitary conditions. For example, a dirty bedside commode could harbor C-diff.

Host



Resident



Staff member



Vendor or visitor

What can be done in LTC Facilities to prevent reservoirs and hosts?

- Stop wild animals or birds from nesting on the premises where people may come in contact with e.g., nests and fecal matter.
- Avoid creating reservoirs by keeping all areas clean and free from clutter that can hide a reservoir. For example, keep utility rooms clean and cleaning equipment well maintained and stored properly.
- Avoid being a host by protecting yourself from a reservoir by wearing gloves before touching something that may be harboring germs or performing hand hygiene after touching it.

The Chain of Infection and How to Use it to Prevent the Spread of Infection in LTC



The next link  **Portal of Exit**

The portal of exit is the route germs use to leave a host

This can be from a natural opening in our body such as our:

- Nose
- Mouth
- Urinary system
- GI system
- Sweat glands
- Tear ducts

Germs can also exit through breaks in our body's integrity:

- Open sores
- Open wounds
- On devices that enter and leave our bodies i.e., needles and drains

What can be done to prevent germs from leaving a host?

Unfortunately, we can't always stop germs from exiting a host, but we can prevent them from reaching a new host:

- Use source control. For example, by having a person infected with a respiratory illness wear a face mask when around others.
- Keep wounds and sores covered to prevent secretions or blood leaking from them.
- Use safety devices to cover needles and dispose of them appropriately.
- Be aware of what portal of exit a pathogen will use to know how to avoid it. For example, Tuberculosis uses the respiratory tract so wear an N95 respirator around anyone infected with TB.

The Chain of Infection and

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The next link  Mode of Transmission

This is how germs get from one place to another

Direct transmission

- This happens when there is human-to-human contact.
- Germs spread using human-to-human transmission when we have unprotected contact with an infected person during care and non-care activities such as when we:

Kiss

Assist with ambulation

Assist with bathing

Hug

Assist with dressing

Assist with feeding

Shake or hold hands

Assist with toileting

Obtain vital signs

Indirect transmission

This happens when infections are passed on without human-to-human contact

For example, when:

- Germs are coughed into the air and then breathed in by another person.
- Secretions from a wound leak onto a surface that is then touched by another person.
- Germs are dispersed into the air and breathed in during a change of linens from an infected person's bed.
- Germs are dispersed into the air and breathed in when waste is pushed down to make room in a trash container.
- The breeze from a fan blowing in an infected person's room carries germs to an area where someone breathes them in.



The Chain of Infection and

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What can we do to avoid germs being transmitted to others?



Avoid unprotected contact with a sick resident or potentially infected surface:

- Wear PPE such as gloves, eye protection, gowns, and masks.



Avoid doing anything in a way that can disperse pathogens into the air:

- Flapping or shaking linens into the air.
- Using fans or having air blowing where it can carry germs.
- Compacting waste in trash cans.



Perform proper hand hygiene:

- Before and after providing any care task. For example, toileting, dressing, bathing, and feeding.
- After touching any surface or using equipment, even if you only did a small task such as straightening a bedside table.
- Before eating and drinking or touching your own face.



Avoid contact with splashes when emptying urinary catheters, ostomies, and other drains.

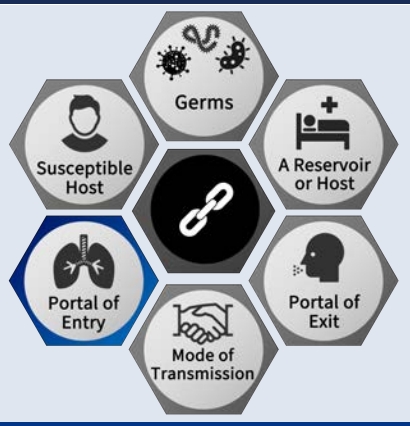


Keep wounds covered.



Keep surfaces disinfected, especially in rooms where there are sick residents.

The Chain of Infection and How to Use it to Prevent the Spread of Infection in LTC



The next link  → Portal of Entry

This is how germs get into our bodies to cause infection

There are several ways germs get into our bodies to cause infections, such as:

- Inhaling them into our respiratory system.
- Having contact with our mucous membranes such as our eyes and mouth.
- Through tubes such as urinary catheters, wound drains, or an IV.
- Eating or drinking contaminated foods and drinks.
- Allowing an infected substance to come in contact with openings in our skin, such as cuts, sores, or wounds.

How to prevent pathogens getting into our bodies

- Wear a mask that covers our nose and mouth to prevent breathing them in.
- Avoid taking germs to our nose, mouth, or eyes with unclean hands.
- Keep wounds covered to prevent germs from coming in contact with them.
- Perform meticulous care on lines and tubes – work clean to dirty.
- Always perform proper hand hygiene before and after contact with others or surfaces.

The Chain of Infection and How to Use it to Prevent the Spread of Infection in LTC



The last link  → Susceptible Host

This is someone who does not have immunity or ability to fight off the germs

A susceptible host could be you, your residents, other staff, and any of your contacts.

Keep in mind that:

- Residents are more susceptible to germs because as we age our immune systems weaken.
- Residents who have a chronic illness are more susceptible to germs i.e., residents with kidney failure who are going through dialysis.
- Residents who are immunosuppressed are more susceptible to germs i.e., residents undergoing chemotherapy for cancer treatment.
- Residents who have invasive medical devices i.e., a urinary catheter are also at more risk.

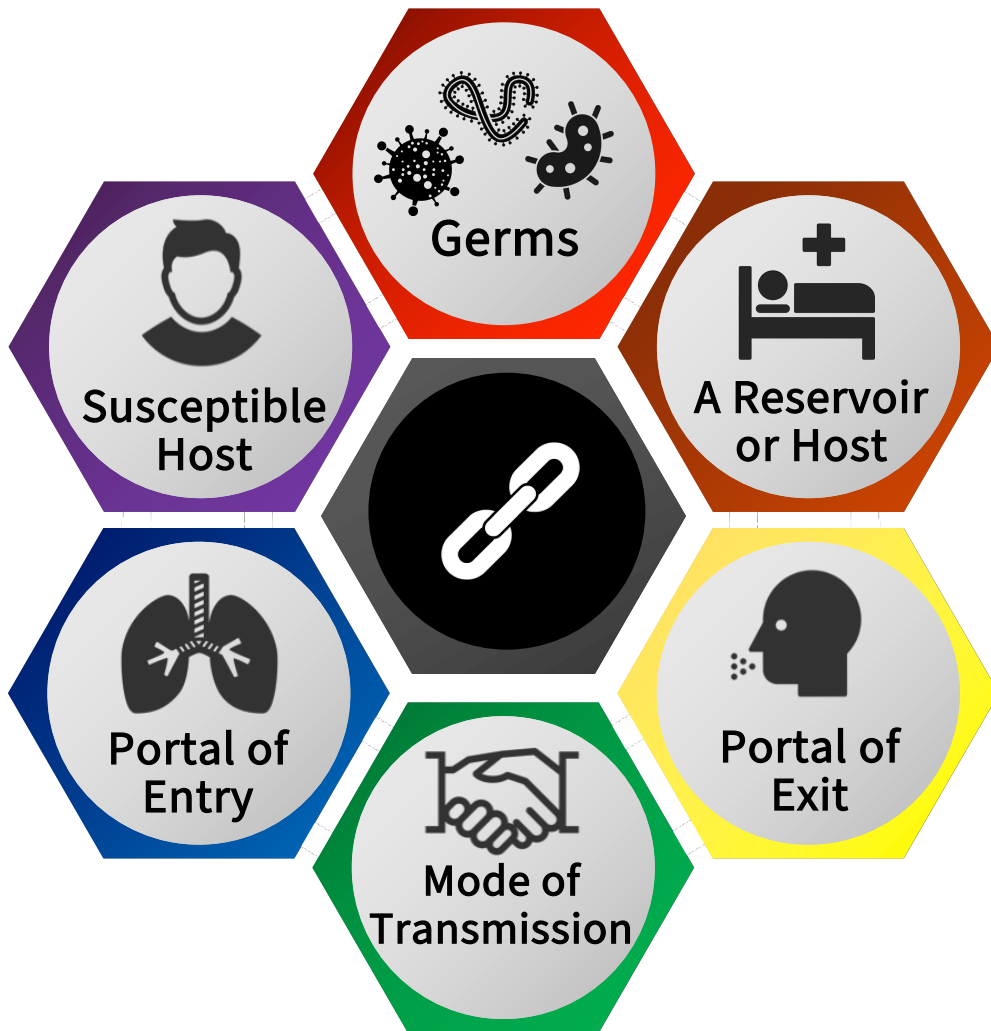
Everyone is a susceptible host anytime there is a new pathogen or a disease that is not seen often and to which there is no vaccine

How to protect susceptible hosts

- Take steps to avoid getting infected:
 - Wear and use PPE properly.
 - Perform proper hand hygiene often and before and after touching residents.
 - If available, get vaccinated to protect yourself, residents and others.
- Take steps to not carry germs from one room to another:
 - Perform proper hand hygiene.
 - Change PPE.
- Don't rely on having immunity from a previous illness with the germ.
 - It's not always predictable on how long immunity lasts
 - Some germs are able to mutate making it possible to be reinfected.

The Chain of Infection and

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Summary

➤ The chain of infection has six links that can be broken to stop or control the spread of infection.

➤ Fortunately, germs don't move around in facilities on their own - they rely on contact with someone, or something to move them around.

➤ Take steps to break the links in the chain of infection to keep yourself safe, and by doing that, you will keep your residents safe.

**LET'S WORK TOGETHER
TO FIGHT OFF GERMS**