Planning for Infection Prevention and Control in Shelters

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Objectives

Setting:
- Establishing Infection control Policies
- Procedures and evaluation in Shelter
- Elements to prevent Infection
- Chain of Infection
- General Infection control measures

Four Links in the Infection Chain

Place a germ likes to live

- Person
- Animal
- Food
- Water
- Soil
- Soil
- Food
- Animal
- Person

Virus
- Bacterium
- Fungus
- Parasite

Germ, bug, Coody
Host

Person or animal that does not have immunity to the germ

* Not vaccinated

* New bug (novel virus, etc.)

* Naïve immune system

Vehicle of transmission

- Person to person direct contact
- Droplet: 6 to 8 foot radius
- Fomites: contaminated food, water, feces, surfaces, articles
- Airborne: TB, Measles

Vehicle of transmission

- Droplets: sneezing, coughing, shaking out soiled laundry, vacuuming and sweeping
- Airborne: Hangs in the air, requires air exchange

Port of entry in the host

Lungs
Blood
Eyes, nose, mouth
Mucous membranes
Break in skin

Infection Control Measures 2010

Port of entry in the host

Mucous membranes
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Infection Control Measures 2010

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Infection Control Measures 2010

Removing one or more of these links breaks the chain of infection...

Infection control practice is important. Environmental conditions can contribute to communicable disease spread within shelters. These conditions include water, sanitation, food, and environmental controls.

Severe Weather Shelters are not expected to administer healthcare services in the traditional sense. BUT...

- Triage
- Surveillance
- Identifying contagious individuals requiring health support

An ICP designee needs to be identified by each shelter and included in the operation planning. The ICP: Infection Control Point Person.

...bUT breaking the chain of infection...

Removal of one or more of these links...

Four links in the infection chain...
Infection Control Measures 2010

Goals
- Identify contagious persons & those who need medical support
- Identify contagious persons & those who need medical support
- On-going assessment
- Send ill staff home
- Isolate those that are potentially contagious
- Transfer ill persons whose needs cannot be met in the shelter to a medical facility ASAP
- Train shelter workers to perform basic triage

Your shelter
Reduce secondary disease transmission at
- Identify contagious persons & those who need medical support

Planning for Infection Prevention
- Surveillance
- Triage

Immunizations
- PPE
- Hand hygiene
- Resident placement
- Linen & laundry management
- Decontamination
- Transport
- Resident placement
- Laundry & Linen
- Septic management
- Wastewater management

Resident Transport
Infection Control Measures 2010

Triage people based on risk of being contagious

Certain symptoms may indicate someone has a communicable disease

Infection Control Measures 2010

Triage & Surveillance

Sheltered individual triage/assessment performed:
- Upon arrival/admission to the shelter

Then Sheltered individuals and shelter workers should be encouraged to report symptoms of infectious diseases between screenings.

Sheltered individual triage/assessment report be performed:
- Sheltered individual triage/assessment

Triage & Surveillance

Communicable disease

Certain symptoms may indicate someone has a communicable disease.
Immunizations

Vaccinations for Adults

You're never too old to get immunized!

Getting immunized is a lifelong, life-protecting job. Don't leave your healthcare provider's office without making sure you've had all the vaccinations you need.

Shelter workers should be brought up to date on adult immunizations before starting work in the shelter.

Identify flu immunizations resources for residents.

1-800-safenet
Infection Control Measures 2010

1. Limit resident transport unless clinically indicated
2. Encourage residents to wear surgical mask if no contraindication
3. Inform the receiving service/department of concern
4. Clean / disinfect area(s) after use

The close proximity of displaced individuals can increase the risk of disease transmission. Lack of routine sanitary services can increase and stink in conjunction with a decrease of displaced individuals. Families (especially those with small children) should be placed together. Placement determined by review of the Syndromic Surveillance Assessment/Triage Form.

Placement of Residents

Healthcare Facility

Transfer to
Symptomatic individuals should be cohorted based on their type of symptoms.

1. Isolate suspected cases
   - In an isolation room or designated area
   - Place in a separate area away from the rest of the group, maintaining a minimum of 1 meter distance between individuals.

2. When single rooms are fully occupied, cohort residents with the same symptom profile in an area away from the rest of the group, maintaining a minimum of 1 meter distance from each other, head to toe.

Isolation Area

- Choose an area that is separated from the rest of the shelter.
- Separate exits/entrance
- Use plastic sheeting "walls" floor to ceiling "walls"
- Signage/post PPE use
- Separate exit/entrance

Strategies of ill resident Placement

1. Isolate suspected cases
2. Cohort residents

If available, use individual sleeping areas, or cots, to prevent the spread of infection.

Sleep head to toe with a minimum of 3 feet between individual sleeping areas (or cots) to prevent the spread of infection.

Symptomatic individuals should be cohorted based on their type of symptoms.
* Hand Hygiene

- Coughing, sneezing, or blowing you nose
- Disposing of garbage or waste
- Toileting
- Diaper changing
- Food handling

80% of all pathogens in the hospital and home environment are spread through hand contact.

* Standard Precautions

* Hand Washing

Protect yourself and others
Hand Hygiene

- Avoid skin-to-skin contact with infected persons
- Avoid contact with other people's wounds
- Keep cuts and abrasions covered
- Visible dirt
- Or other potentially contaminated Fomites
- Handling soiled laundry
- Always before and after putting on gloves

How to wash your Hands:

1. Wet your hands with warm water.
2. Apply a generous amount of soap.
3. Wash palms, backs of hands, wrists, fingers and under fingernails. Rub hands for 20 seconds.
4. Rinse hands. Turn faucet off using a paper towel.
5. Dry hands with a new paper towel.
6. Use the paper towel to open the door.

- Use alcohol-based hand sanitizer if soap and water is not available.
- Keep cuts and abrasions covered
- Avoid contact with other people's wounds
- Avoid skin-to-skin contact with infected persons

Hand washing breaks the chain of transmission.
Every three minutes, a child brings his/her hand to nose or mouth.

Every 60 seconds, a working adult touches as many as 30 objects.

Hand hygiene facilities (sinks and/or Alcohol Based Hand Rubs) conveniently located:

- In or just outside every isolation area.
- In every eating area.
- In food preparation and/or kitchen areas.
- As needed throughout the shelter.

Personal protective equipment (PPE):

- Required to protect the wearer from exposure to microorganisms.
- Gear designed to protect the wearer from exposure to microorganisms.
- Choose PPE based on the procedure you are performing.
- Examples of PPE include gloves, gowns, or aprons.

- When you expect hand exposure to any body fluid, you should wear gloves.
- When you expect splashing or spraying, such as when you clean an area contaminated with body fluids, you should wear an apron, gloves, and protective eyewear.

Hand Hygiene:

- Every three minutes, a child touches an object.
- Every 60 seconds, a working adult touches as many as 30 objects.
- Every time you touch your mouth, you may be spreading diseases.

Hand Hygiene Measures 2010:

- Personal protective equipment (PPE).
- Hand hygiene facilities (sinks and/or Alcohol Based Hand Rubs) conveniently located.
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Infection Control Measures 2010

**Personal Protective Equipment**

- **Gloves**
  - Most common
  - Non-sterile
  - Change for each encounter or cleaning task
  - Disposable glove should not be reused
  - Change gloves when heavily contaminated

- **Gown**
  - When splashes or sprays of body fluids, secretions, excretions, and contaminated items are likely

- **Mask**
  - Order and maintain supplies
  - Develop a policy

- **Eye Protection**
  - Order and maintain supplies

- **Apron**
  - Order and maintain supplies

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When exposed to blood, body fluids, secretions, excretions, mucous membranes, and non-intact skin, and contaminated items, perform hand hygiene immediately after glove removal.

Disposable glove should not be reused.

Change gloves when heavily contaminated.
Infection Control Measures 2010

PPE - Apron

- Be aware with an apron arms are exposed to contamination
- Avoid touching the outside of the covering when in use and when removing
- Change PPE promptly if heavily contaminated during cleaning

Masks and eye protection:

- When splashes or sprays of body fluid

PPE - Mask

- Contaminated during cleaning
- Change PPE promptly if heavily

Germs spread

Unhygienic situations

PPE removal

1. Avoid touching the external surface.
2. Perform hand hygiene immediately after PPE removal.
3. PPE should not be worn / taken out of the shelter immediately after PPE removal.
4. Disinfect reusable items and store until the shelter.
5. Single use items should be properly disposed

End of work period change clothes, bathe and don't wear shoes into your home.

PPE - Apron
Proper cleaning and disinfection are essential to decrease the risk of disease transmission. Shelter workers should receive clear guidance and training regarding the principles of cleaning and disinfection. Water, food, sanitation, and environmental controls of bathrooms, kitchens, and regular trash areas are needed to prevent disease emergence and spread. The holding area for disposal of waste materials should be safe, clean, and free of access by vermin and insects. Regular trash receptacles should be available and emptied regularly to ensure they do not become overfilled. Adequate trash receptacles should be stored in a safe, clean, and insect-free area. Medical sharps are not mingled with regular trash. The holding area for disposal of waste materials should be safe, clean, and free of access by vermin and insects. Do not let ill people handle food. Do not pour mop water down sinks (use a toilet) and use separate mop for kitchen and bathrooms. Standard dish washing is fine for killing germs. Maintain general routine cleaning of surfaces.
Infection Control Measures 2010

Housekeeping

- SHARPS disposal
  - Provide puncture resistant container for needles and other contaminated sharps
  - Discard all body substance soiled items in plastic sharps disposal bags

- Extra measures must be taken when cleaning for a group of people in a contained space while cleaning, preparing food and disposing of waste

- Wear gloves (mask) and wash hands after handling

- Clean toilet
  - Flush blood, diarrhea, vomit down the toilet and for pick up

- Bathroom
  - Sinks, taps, bottom of the toilet seat
  - Norovirus, Giardia, Cryptosporidium, Shigella

- Kitchen
  - Phones, tap handles, desk tops, door knobs
  - E. coli, influenza, Para influenza, norovirus

- Hard surfaces
  - Phones, tap handles, desk tops, door knobs

- Laundry, towels, bed sheets
  - Salmonella, hepatitis A virus, norovirus, E. coli

Environment

- Fomites on hard surfaces
  - Phones, sink, cutting board, table tops
  - E. coli, norovirus

- Fomites on clothing
  - Laundry, towels, bed sheets
  - Salmonella, hepatitis A virus, norovirus, E. coli

- Fomites on bathroom
  - Sinks, taps, bottom of the toilet seat

- Fomites on kitchen
  - Sponges, sink, cutting board, table tops
  - Salmonella, Campylobacter, E. coli
Air dry
adequate disinfection
Let in place 5 to 10 minutes to ensure
freshly-made

1/2 cups bleach to 100 parts water =
10 parts bleach to 1 gallon of water

Disinfection Agent:
EPA-registered quaternary ammonium compound **

Selection of Cleaning/Disinfection Agents

Two "recipes"
A bleach solution compound

Decontamination Recipe:

For routine cleaning use a 1000 ppm bleach solution freshly made within 24 hours.

1 1/2 cups bleach to one gallon of water

Air dry

% of norovirus detected on surfaces
- during outbreak at a college campus: 18%
- after cleaning with soap and water: 48%

% of surfaces on which E. coli detected:
- in restroom: 8%
- after cleaning with soap and water: 48%
- during outbreak at college campus: 16%

% of norovirus detected on surfaces

aqua blue green

Exposure to Pathogens

Fomite cleaning is not enough to Prevent
Infection Control Measures 2010

Bleach
- Cheap, effective and available
- Works on Norovirus
- Use some precautions when handling
  - Wear gloves
  - Make it fresh every 24 hours
  - Never mix with other products, just water

Things You'll Need:
- Labeled bag
- Disposable gloves
- Disposable face masks
- Disinfectant cleaner
- Paper towels
- Kitty Litter
- Plastic bags (optional)
- Plastic scoop (optional)

Cleaning up vomit:

1. Wipe frank material with paper towels
2. Clean area with hot water and detergent and paper towels
3. Apply a 1 to 9 freshly made bleach solution and let stand for 10 minutes. Then wipe up with fresh towels
4. Dispose of gloves and seal all in a second plastic bag.

Environment

Housekeeping

Spill Kit
- Body Fluid
- Plastic bags
- Plastic scoop (optional)
- Kitty Litter
- Paper towels
- Disinfectant cleaner
- Disposable face masks
- Disposable gloves
- Labeled bag
Cleaning Cots/Mattresses
- Cover with a waterproof barrier to prevent them from becoming contaminated. If resources are limited, prioritize the incontinent or those with a draining wound.
- If cots/mattresses become contaminated, they should be cleaned/disinfected. Disinfection procedures depend on the cot/mattress material:
  - Plastic materials should be disinfected using the procedure for cleaning body fluid spills.
  - Cloth/canvas materials should be cleaned by scrubbing with soap and water or disinfectant.
- Grossly contaminated cots/mattresses may need to be discarded.

Disinfect isolation rooms or area
1. Clean and disinfect the environment.
2. If body substance spills occur:
   - Use one part of hypochlorite solution to 9 parts of water after cleaning with soap and water and let stand for 5 to 10 mins.
3. Change trash bags and do not let overflow.

Bathrooms
- Provide soap, paper towels, waste receptacles and hand washing signage.
- Routinely clean toilets, showers, floors, sinks, doorknobs, light switches and high touch surfaces.
- Wash clothes, washcloths, towels, razors, toothbrushes, cups, combs, towels or accessories used to clean body substance spills.
- Disinfect with a disinfectant or a 1/3 cup to a gallon freshly made bleach solution.
- Change trash bags and do not let overflow.
- Crossly contaminated cots/mattresses may need to be discarded.
- Cloth/canvas materials should be cleaned by:
  - The procedure for cleaning body fluid spills.
  - Plastic materials should be disinfected using:

Cleaning Cots/Mattresses

Environment

Bathrooms
Infection Control Measures 2010

Toilet brushes, mops, sponges should be cleaned with a bleach solution after each use.

Laundry
- Use hottest water and bleach
- Dispose of chunky material before washing
- Change sheets with each resident
- Do not shake soiled linens
- Soiled cloth or linen should be cleaned with a bleach solution after each use
- Wear gloves and mask if handling visible

Ventilation
- Attempt to provide good air exchange

Environment

Linen and Laundry management
- Proper handling of soiled linen:
  - Wear appropriate PPE when handling soiled linen
  - Pack linen in leak proof containers/bags
  - Minimize agitation and shaking
  - Avoid sorting

Ventilation
- Attempt to provide good air exchange

Atmosphere
- Ventilation
Close contact between animals and humans can pose an infection risk if the animal bites or scratches a human.

- Any one bitten, scratched, or otherwise hurt by an animal should be referred to a healthcare provider for assessment.

Children 6 years of age should not handle reptiles.

- Pregnant women or immunocompromised individuals should be screened for current vaccination status.

- If vaccinations are not up to date, the animal should be physically separated from other animals.

- Dogs and cats should be treated with medication to kill fleas, ticks, and internal parasites.

- Children > 5 years of age should not handle rodents (hamsters, gerbils, and guinea pigs).

- Service dogs/animals should be allowed to stay within the shelter in accordance with the Americans with Disabilities Act of 1990.

- If pets are to be housed in a shelter, pregnant or immunocompromised individuals should be instructed to avoid contact with used cat litter, cat feces, and pet rodents (hamsters, gerbils, and guinea pigs).

- Dogs and cats should be housed in a separate location. All pets, except service dogs/animals, should be housed in a separate location.

- Anyone bitten, scratched, or otherwise hurt by an animal should be referred to a healthcare provider for assessment.
**Infection Control Measures 2010**

- Do not share food with pets nor allow pets to lick their faces.
- Perform hand hygiene after visiting their pet in the pet shelter.
- Pet food should be stored in a similar manner as human food.
- Perform hand hygiene after visiting their pet in the pet shelter.
- Do not share food with pets nor allow pets to lick their faces.

**Contaminated Fomites**
- May live 24 to 48 hours on surfaces.
- Large respiratory droplets.
- Airborne 3 to 6 feet.

**Severity of Illness**
- Fever
- Cough
- Sore throat
- Headache
- Runny nose
- Tiredness
- Chills, body aches
- Vomiting, diarrhea

**Severity of Illness varies from mild to severe.**

**Influenza**
- Fever
- Cough
- Sore throat
- Headache
- Runny nose
- Tiredness
- Chills, body aches
- Vomiting, diarrhea

**Norovirus**
- Fever
- Cough
- Sore throat
- Headache
- Runny nose
- Tiredness
- Chills, body aches
- Vomiting, diarrhea

**Bedbugs**
- Fever
- Cough
- Sore throat
- Headache
- Runny nose
- Tiredness
- Chills, body aches
- Vomiting, diarrhea
Every flu season is different, and Influenza can affect people differently. Even healthy kids and adults can get very sick from the flu and spread it to others.

Everyone aged 6 months & older should receive an annual influenza vaccination.

It takes two weeks for antibodies or immunity to develop after receiving the flu vaccine. Get it early during the flu season, either October or early November.

The flu season runs well into spring, getting the shot later in the flu season is still beneficial.

Infection Control Measures

- Cover cough
- Wash hands
- Stay home when sick
- Get vaccinated
- Cover cough

Norovirus Infection Symptoms

- Vomiting
- Diarrhea
- Nausea
- Abdominal cramps
- Headache, muscle aches
- Dehydration
- Vomiting

About Norovirus

Norovirus is a RNA virus and is highly contagious. It is known to cause vomiting and diarrhea and is seen most commonly in the winter months.

Getting infected with Norovirus can be difficult to treat, and it is very common to see outbreaks in crowded places such as schools, dormitories, and cruise ships.

Respiratory hygiene and cough etiquette

- Use tissue paper to contain respiratory secretions and dispose in waste receptacle
- Put on a surgical mask
- Perform hand hygiene if contact respiratory secretions and contaminated objects
- Cover the nose/mouth when coughing or sneezing

Norovirus Infection Symptoms

- Headache, muscle aches
- Abdominal cramps
- Diarrhea
- Vomiting

Recommendation for all individuals with respiratory symptoms

- Cover the nose/mouth when coughing or sneezing
- Perform hand hygiene if contact respiratory secretions and contaminated objects
- Put on a surgical mask

To locate a flu shot near you or call 1-800-978-3040

www.flu.oregon.gov
Infection Control Measures 2010

Norovirus Public Health Aspects

- 23-25 million cases in 2002
- About 8% of the U.S. population
- Restaurants, schools, dormitories, eldercare, jails and cruise ships are at risk.
- Basically any institution where large groups are housed and fed.

Adapted from Strategies for Norovirus Infection Control Aboard Cruise Ships, Robert E. Wheeler, MD, 2003.

Norovirus Infection

- Infectious dose of 10-100 virus particles
- 24-48 hour incubation period
- 12-60 hour duration of illness
- A "mild" and short-lived illness
- Webster, MD, 2003

Transmission

- "Oral-fecal" route
- Food (39%)
- Hands, person-to-person (12%)
- Water (3%) etc.
- Also environmental surfaces: carpets, toilets

Adapted from Strategies for Norovirus Infection Control Aboard Cruise Ships, Robert E. Wheeler, MD, 2003.

Modes of Transmission by Food

- Food sources (i.e., food arrives contaminated)
- Food arrives (i.e., food arrives contaminated)
- Food handlers
- Preparation
- Customers

Adapted from Strategies for Norovirus Infection Control Aboard Cruise Ships, Robert E. Wheeler, MD, 2003.
Norovirus Characteristics

- Highly contagious
- Multiple modes of transmission
- Stable in the environment
- Resistant to routine disinfection methods
- Carriers may not be symptomatic (up to 30%)

Adapted from Strategies for Norovirus Infection Control Aboard Cruise Ships, Robert E. Wheeler, MD, 2003.

Responsibilities of building management and staff:

- Encourage tenants or guests to report bed bugs quickly
- Keep records of bed bug (or other pest) complaints on site in a log book
- Respond quickly to complaints with an inspection and intervention
- Respond quickly to complaints with an inspection and intervention
- Encourage tenants or guests to report bed bugs quickly
- Develop an aggressive bed bug control protocol
- Raise awareness about bed bugs

Responsibilities of residents:

- Establish guidelines for reporting signs of bed bugs, and for cleaning and room preparation.
- Cooperate with staff and management in bugs, and for cleaning and room preparation.
- Establish guidelines for reporting signs of bed bugs, and for cleaning and room preparation.
- Cooperate with staff and management in bugs, and for cleaning and room preparation.
- Know the signs of bed bugs and check
- Preventing and controlling bed bugs.
- Cooperate with staff and management in bugs, and for cleaning and room preparation.
- Establish guidelines for reporting signs of bed bugs, and for cleaning and room preparation.
- Cooperate with staff and management in bugs, and for cleaning and room preparation.
Some considerations:

- Have tenants wash and/or place all belongings in hot dryer upon check in to shelter.
- Items that can not be hot dried, inspect for signs of bed bugs.
- Do not rely on pesticides, they are ineffective and can be harmful to people and animals.
- Inspect and clean donated furniture and items.
- Have tenants wash and/or place all belongings in hot dryer upon check in to shelter.

Communication: Vital and Essential

- Internal call down list
- Link to local, state and federal for current public health information
- Point of contact

Infection Control

- Establish appropriate use of PPE, cleaning, basic IC practices in group settings
- Establish shelter infection control training program
- Provide training in its use
- Establish funding and procedure for providing basic infection control supplies, such as masks, gloves
- Use alcohol based hand rubs with caution. Risk of ingestion by homeless clients

Establish infection control guidelines regarding use of PPE, cleaning, basic IC practices in group settings

Establish a site specific plan to screen in coming residents.

Establish training in its use.
Infection Control Measures 2010

- Stock up
  - Disinfectants, i.e. chlorine bleach
  - Dedicated cleaning supplies for bathrooms and kitchens
  - Disposable toweling, etc.
  - Gloves, masks, clothing covers for messy tasks
- Check expiration dates on supplies and replace
- Evaluate response
- Lessons learned
- Update policies for next season
- Volunteer Training
- Bed Bug Strike Team

End of Operational Period
Hand contact and fomite contamination play a significant role in norovirus transmission. Plan and assess gaps and needs at your site to implement good infection control practice.

Thank you