

North Carolina
SPICE
Statewide Program for
Infection Control & Epidemiology

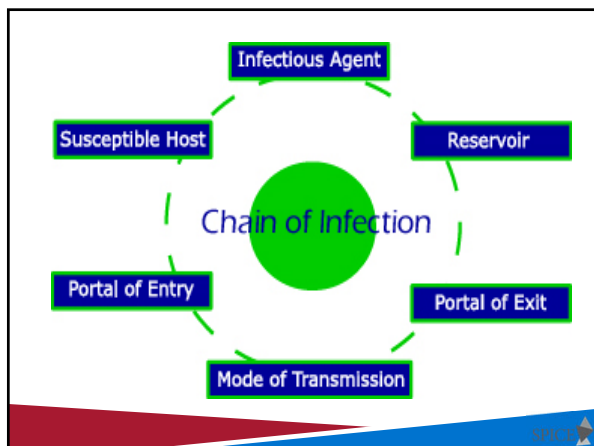
Module C

**EPIDEMIOLOGY AND RISK OF INFECTION IN HOME
HEALTH AND HOSPICE**

Statewide Program for Infection Control and Epidemiology
(SPICE)
UNC School of Medicine


OBJECTIVES

- ▶ Discuss the infectious process
- ▶ Review methods for controlling transmission of infection:
 - ▶ Standard Precautions
 - ▶ Transmission-based Precautions
- ▶ Describe steps for detecting and controlling outbreaks



INFECTIOUS AGENT OR "THE HARMFUL GERM"


- ▶ Bacteria (MRSA, VRE)
- ▶ Viruses (Influenza, Norovirus)
- ▶ Fungi (*Candida*, *Aspergillus*)
- ▶ Parasites (*Giardia*, pinworms)
- ▶ Arthropods (mites)
 - ▶ Infestations, not infections



RESERVOIR OR "HIDING PLACES"


Where germs live, grow, and increase in numbers

- ▶ A person
- ▶ Environment/Fomite
- ▶ An animal



PEOPLE AS RESERVOIRS

- ▶ Blood
- ▶ Skin
- ▶ Digestive tract
 - ▶ Mouth, stomach, intestines
- ▶ Respiratory tract
 - ▶ Nose, throat, lungs
- ▶ Urinary tract




PORTALS OF EXIT AND ENTRY

EXIT OR "THE WAY OUT"

- ▶ **Nose and mouth**
 - Allows germs to leave in mucous droplets, and saliva or spit
- ▶ **Gastrointestinal tract**
 - Allows for germs to leave in stool and/or vomit
- ▶ **Skin**
 - Allows for germs to leave through direct contact, in blood, pus, or other liquids that come from the body.

ENTRY OR "THE WAY IN"

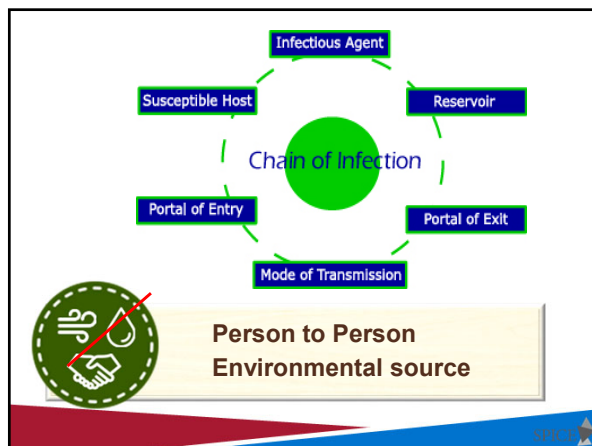
- ▶ **Nose and mouth**
 - Allows germs to enter in mucous droplets, and saliva or spit
- ▶ **Gastrointestinal tract**
 - Allows for germs to enter via ingestion
- ▶ **Skin**
 - Allows for germs to enter through direct contact, with blood, pus, or other liquids that come from the body.



SUSCEPTIBLE PERSON

- ▶ Age
- ▶ Stress
- ▶ Fatigue
- ▶ Poor Nutrition
- ▶ Chronic Illnesses
- ▶ Not properly vaccinated
- ▶ Open cuts, skin breakdown
- ▶ Medications





MODES OF TRANSMISSION

Contact

Droplet

Airborne

MODES OF TRANSMISSION

CONTACT

DIRECT CONTACT

 Person to person contact and physical transfer of organisms

INDIRECT CONTACT

 Contact with a contaminated surface or device

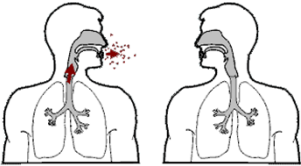
MODES OF TRANSMISSION

Droplet – an infectious agent travels as a very large particle over a short distance by air current (usually 3-6 feet)

*Droplets may arise from speaking, coughing or sneezing
 Need to be relatively close*

MODES OF TRANSMISSION

Airborne –
infectious agent
travels as very
small particles over
long distances by
air current




Small respiratory droplets, that can remain infective for long periods of time are dispersed when an infected person coughs, sneezes, laughs or speaks. May spread thru ventilation systems

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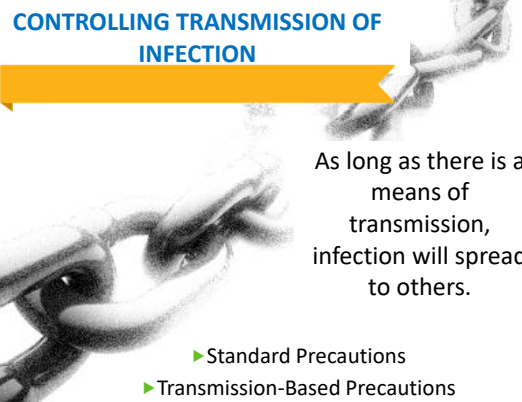
KNOWLEDGE CHECK

The Chain of Infection Includes which of the following:

1. Infectious agent, reservoir, mode of transmission and isolation precautions
2. Susceptible host, portal of entry, OSHA rules, medical waste
3.  Mode of transmission, infectious agent, susceptible host, reservoir, portal of entry and portal of exit
4. None of the above

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CONTROLLING TRANSMISSION OF INFECTION



As long as there is a means of transmission, infection will spread to others.

- Standard Precautions
- Transmission-Based Precautions

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CONTROLLING TRANSMISSION



Standard Precautions

- Hand hygiene
- Use of personal protective equipment
- Respiratory hygiene/cough etiquette
- Safe injection practices
- Use of a mask when injecting the epidural space
- Safe handling of potentially contaminated equipment






THE BEST WAY TO STOP THE SPREAD OF INFECTION

Hand Hygiene

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THE BEST WAY TO STOP THE SPREAD OF INFECTION

HAND HYGIENE



- ▶ Good hand hygiene, including use of an alcohol-based hand rub and washing with soap and water is critical in reducing the risk of transmission of infections in any healthcare setting
- ▶ Use of an alcohol- based hand rub is recommended as primary mode of hand hygiene except when hands are visible soiled
 - ▶ Dirt
 - ▶ Blood,
 - ▶ Body fluids
 - ▶ Caring for patient with infectious diarrhea

Hand hygiene is discussed in detail in Module E, "principals of asepsis"



PERSONAL PROTECTIVE EQUIPMENT

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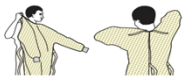






PERSONAL PROTECTIVE EQUIPMENT

- ▶ Second component of Standard Precautions is Personal Protective Equipment (PPE)
- ▶ Wearable equipment that is intended to protect healthcare personnel from exposure or contact with infectious agent
- ▶ Examples:
 - ▶ Use of gowns to protect skin and clothing
 - ▶ Use of gloves in situations involving possible contact with blood, body fluids, non-intact skin and/or mucous membranes
 - ▶ Use of mouth, nose and eye protection during procedures likely to generate splashes or splatters of blood or other body fluids

SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions required, such as standard and contact, droplet or airborne infection isolation precautions. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

- 1. GOWN**
 - Fully cover torso from neck to knees, arms to end of wrists, and wrap around the back
 - Fasten in back of neck and waist
- 2. MASK OR RESPIRATOR**
 - Secure ties or elastic bands at middle of head and neck
 - Fit flexible band to nose bridge
 - Fit snug to face and below chin
 - Fit-check respirator
- 3. GOGGLES OR FACE SHIELD**
 - Place over face and eyes and adjust to fit
- 4. GLOVES**
 - Extend to cover wrist of isolation gown

HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE)
EXAMPLE 1

There are a variety of ways to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. Here is one example. Remove all PPE before exiting the patient room except a respirator, if worn. Remove the respirator after leaving the patient room and closing the door. Remove PPE in the following sequence:

- GLOVES**
 - Outside of gloves are contaminated?
 - If your hands get contaminated during glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
 - Using a gloved hand, grasp the palm area of the other gloved hand and peel off first glove
 - Hold removed glove in gloved hand
 - Slide fingers of ungloved hand under remaining glove at wrist and peel off second glove over first glove
 - Discard gloves in a waste container
- GOGGLES OR FACE SHIELD**
 - Outside of goggles or face shield are contaminated?
 - If your hands get contaminated during goggles or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer
 - Remove goggles or face shield from the back by lifting head band or ear pieces
 - If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container
- GOWN**
 - Gown front and sleeves are contaminated?
 - If your hands get contaminated during gown removal, immediately wash your hands or use an alcohol-based hand sanitizer
 - Untie/unfasten gown ties, taking care that sleeves don't contact your body when reaching for ties
 - Roll gown away from neck and shoulders, touching inside of gown only
 - Turn gown inside out
 - Fold or roll into a bundle and discard in a waste container
- MASK OR RESPIRATOR**
 - Front of mask/respirator is contaminated — DO NOT TOUCH
 - If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
 - Grasp bottom ties or straps of the mask/respirator, then the ones at the top, and remove without touching the front
 - Discard in a waste container
- WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE**

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HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE)
EXAMPLE 2

Here is another way to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. Remove all PPE before exiting the patient room except a respirator, if worn. Remove the respirator after leaving the patient room and closing the door. Remove PPE in the following sequence:

- GOWN AND GLOVES**
 - Gown front and sleeves and the outside of gloves are contaminated?
 - If your hands get contaminated during gown or glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
 - Grasp the gown in the front and pull away from your body so that the ties break, touching outside of gown only with gloved hands
 - While removing the gown, hold or roll the gown inside-out into a bundle
 - As you are removing the gown, peel off your gloves at the same time, only touching the inside of the gloves and gown with your bare hands. Place the gown and gloves into a waste container
- GOGGLES OR FACE SHIELD**
 - Outside of goggles or face shield are contaminated?
 - If your hands get contaminated during goggles or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer
 - Remove goggles or face shield from the back by lifting head band and without touching the front of the goggles or face shield
 - If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container
- MASK OR RESPIRATOR**
 - Front of mask/respirator is contaminated — DO NOT TOUCH
 - If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
 - Grasp bottom ties or straps of the mask/respirator, then the ones at the top, and remove without touching the front
 - Discard in a waste container
- WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE**

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USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE)

➤ Three overriding principals related to personal protective equipment (PPE)

- Wear PPE when the nature of the anticipated patient interaction indicates that contact with blood or body fluids may occur
- Prevent contamination of clothing and skin during the process of removing PPE
- Before leaving the work area remove and discard PPE

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DO



DON'T



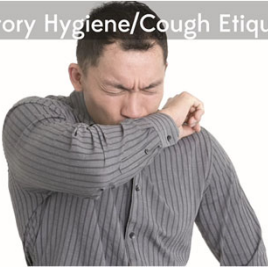
GLOVES:

- ▶ Wear gloves to reduce risk of contamination or exposure to blood/other body fluids
- ▶ Clean hands before donning sterile gloves
- ▶ Clean hands after removing gloves
- ▶ Clean hands and change gloves between task (moving from one body site to another)
- ▶ Make sure gloves correct type and fit
- ▶ Follow facility policy


- ▶ Re-use or wash gloves (except for utility gloves)
- ▶ Substitute glove use for hand hygiene
- ▶ Use non-approved hand lotions
- ▶ Use gloves if damaged or visible soiled
- ▶ Touch your face when wearing gloves
- ▶ Wear the same pair from one patient to another
- ▶ Wear gloves in the hall
- ▶ Forget to remove and dispose of appropriately




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Respiratory Hygiene/Cough Etiquette






CONTROLLING TRANSMISSION

RESPIRATORY HYGIENE/COUGH ETIQUETTE

- ▶ Third element of standard precautions is Respiratory Hygiene/Cough Etiquette
- ▶ Strategy designed to contain respiratory secretions:
 - ▶ Patients
 - ▶ Accompanying individuals who have signs and symptoms of a respiratory infection
- ▶ Initial point of encounter:
 - ▶ When entering the home



CONTROLLING TRANSMISSION

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TRANSMISSION-BASED PRECAUTIONS

- ▶ Certain conditions (syndromes) require triage and additional attention
 - ▶ Diarrhea (*C. difficile*, norovirus)
 - ▶ Febrile respiratory illness (influenza)
 - ▶ Febrile rash (chickenpox/shingles, measles)
- ▶ Early detection is important

CONTACT PRECAUTIONS

- ▶ Put on gloves before direct contact with patient or immediate environment.
- ▶ Use gown for contact with:
 - ▶ Uncontrolled secretions
 - ▶ Pressure ulcers
 - ▶ Draining wounds
 - ▶ Stool Incontinence
 - ▶ Ostomy tubes or bags

CONTACT PRECAUTIONS CONT'D



- ▶ Limit amount of non-disposable patient care equipment brought into home.
- ▶ Place contaminated re-usable noncritical patient care equipment in plastic bag for transport.
- ▶ Clean horizontal surfaces and equipment with Environmental Protection Agency (EPA)-registered disinfectant



DROPLET PRECAUTIONS



- ▶ Instruct patient to follow respiratory hygiene/cough etiquette.
- ▶ HCP should wear surgical mask upon entry to room.
- ▶ Have patient wear a mask when outside the home.
- ▶ Disinfect all horizontal surfaces and equipment using a Environmental Protection Agency (EPA)-registered disinfectant.






AIRBORNE PRECAUTIONS



- ▶ Have system in place to identify patients with known or suspected airborne spread infections.
- ▶ Instruct patient to follow respiratory hygiene/cough etiquette.
 - ▶ If tolerated, patient can wear surgical mask while in the home to prevent dispersion of microorganism.
- ▶ Educate family regarding the contagious nature of the disease.
 - ▶ Protect vulnerable household members (immunocompromised, <4 yrs old)
- ▶ For TB, HCP must wear fit-tested N-95 respirator upon entry.
- ▶ For Chickenpox and Measles, susceptible staff should wear a surgical mask.
- ▶ Clean horizontal surfaces and equipment with EPA-registered disinfectant.



PRECAUTIONS IN THE HOME

- ▶ Caregivers should wash hands with soap and water after contact with infected or colonized person and before leaving home
- ▶ Use disposable towels to dry hands
- ▶ Do not share personal care items with infected person
- ▶ Disposable gloves should be worn if contact with body fluids is possible. Wash hands following removal
- ▶ Change linens and wash on a routine basis
- ▶ Clean environment routinely and when visibly soiled with body fluids

KNOWLEDGE CHECK


What is the single most effective way to prevent the spread of infections?

1. Using PPE
2. Cleaning patient care equipment
3. ☒ Hand Hygiene
4. Coughing into the crook of elbow or tissue

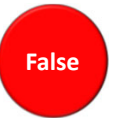
KNOWLEDGE CHECK

True or False

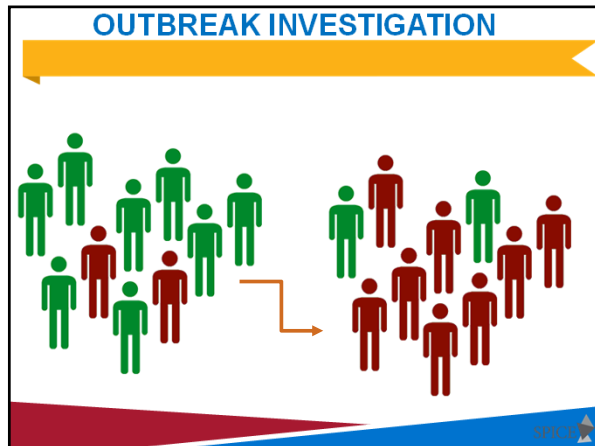
Staff who enter the home of a patient requiring droplet precautions should wear a mask upon entry into the home

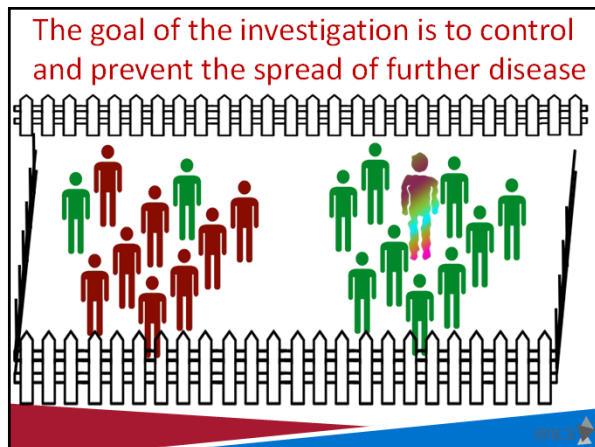


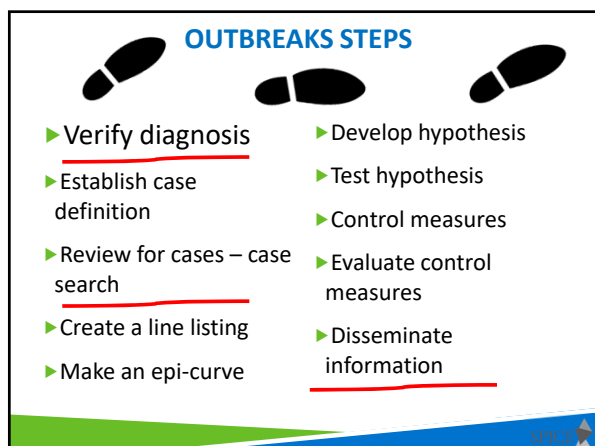
True




False









OUTBREAK INVESTIGATION




Know Who to Call for Assistance

- Your Supervisor/Manager






• Local Health Department



• North Carolina Division of Public Health
919-733-3419



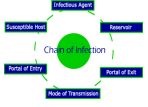
• Statewide Program for Infection Control and Epidemiology (SPICE) spice@unc.edu
919-966-3242

KNOWLEDGE CHECK


Who should be notified of a suspected or known communicable disease outbreak?

- a) Risk Management
- b) Administration/Director
- c) Local Health Department
- ☒ All of the above


SUMMARY



Discuss the "chain of infection"



Review standard and transmission-based precautions for controlling transmission of infections



Describe the steps for detecting and controlling outbreaks