



**UNIVERSITY HOSPITAL**  
Newark, New Jersey

## **University Hospital**

# **Infection Prevention and Control Training**



This training consists of five modules. The learner will receive information in the following areas:

**MODULE I- General Infection Prevention and Control Principles**

**MODULE II- Personal Protective Equipment**

**MODULE III – Hand Hygiene**

**MODULE IV- Bloodborne Pathogens and Sharps Safety**

**MODULE V – Hospital Acquired Infection Prevention**



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# Module I

## General Infection Prevention and Control Principles



## Objectives

At the end of this module, you will be able to:

- Recognize situations where infections are transmitted
- Describe the Chain of Infection
- List modes of disease transmission
- Describe basic components of Standard Precautions
- Describe the different types of transmission-based precautions
- Identify the new isolation signs
- List at least 2 organisms that fall under Enhanced Contact Precautions
- Describe Respiratory Etiquette
- Employee Health



## **Transmission (Spread) of Infection**

**For infection to spread, several things must be present**

1. There must be a source of infectious agent (germs) e.g. people or contaminated objects.
2. A susceptible host such as healthcare workers or persons who are at high risk for infection.
3. A means of transmission (how germs get into the body) such as through breathing in an infectious agent such as TB, blood or body fluid splashes to the face or skin contact with an organism such as Varicella (chickenpox) virus or scabies.



## CHAIN OF INFECTION

In order to prevent transmission, we must break the Chain of Infection:

The Chain of Infection is a well-known model used to understand how infections spread from a source to a susceptible person (host). (See next slide).

- Each link in the chain must be present to allow transmission of infection to occur
- At least one link in the chain must be broken to interrupt transmission of infection e.g. putting a patient with influenza on droplet precautions breaks the chain at the portal of exit



## Break the Chain of Infection

### BREAK THE CHAIN!

- ✓ Immunizations
- ✓ Treatment of underlying disease
- ✓ Health insurance
- ✓ Patient education



### BREAK THE CHAIN!

- ✓ Diagnosis and treatment
- ✓ Antimicrobial stewardship

### BREAK THE CHAIN!

- ✓ Cleaning, disinfection, sterilization
- ✓ Infection prevention policies
- ✓ Pest control



### Infectious agent

- Bacteria
- Fungi
- Viruses
- Parasites



### Susceptible host

- Any person, especially those receiving healthcare.



### Reservoir

- Dirty surfaces and equipment
- People
- Water
- Animals/Insects
- Soil (earth)



### Portal of entry

- Broken skin/incisions
- Respiratory tract
- Mucous membranes
- Catheters and tubes



### Portal of exit

- Open wounds/skin
- Splatter of body fluids
- Aerosols



### Mode of transmission

- Contact (direct or indirect)
- Ingestion
- Inhalation



### BREAK THE CHAIN!

- ✓ Hand hygiene
- ✓ Personal protective equipment
- ✓ Personal hygiene
- ✓ First aid
- ✓ Removal of catheters and tubes



### BREAK THE CHAIN!

- ✓ Hand hygiene
- ✓ Personal protective equipment
- ✓ Food safety
- ✓ Cleaning, disinfection, sterilization
- ✓ Isolation

### BREAK THE CHAIN!

- ✓ Hand hygiene
- ✓ Personal protective equipment
- ✓ Control of aerosols and splatter
- ✓ Respiratory etiquette
- ✓ Waste disposal



## Simple ways to break the chain of infection



**Wash your hands**



**Get your flu shot**



**Cover your cough**

**Clean the environment**



Courtesy of the Assn for Professionals in Infection Prevention and Control (APIC)





## MODES OF INFECTION TRANSMISSION

A  
I  
R  
B  
O  
R  
N  
E



C  
O  
N  
T  
A  
C  
T



Direct

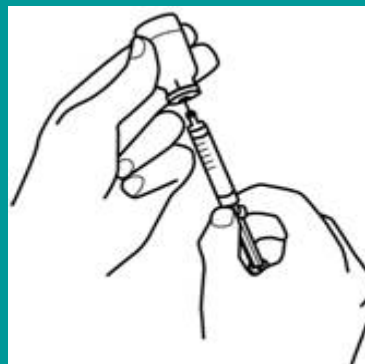


Indirect

D  
R  
O  
P  
P  
L  
E



V  
E  
H  
I  
C  
L  
E



V  
E  
C  
H  
O  
R  
B  
O  
R  
N  
E





## **Colonized or Infected: What is the difference?**

People who carry bacteria without evidence of infection (i.e. no fever, increased white blood cell count, etc.) are colonized.

If an infection develops (i.e. patient shows symptoms such as fever, cough, high white blood cell count), it is often from microorganisms that colonized the patient.

**Bacteria that colonize patients can be transmitted from one patient to another by the hands of healthcare workers.**

**Bacteria can be transmitted even if the patient does not show signs or symptoms of infection.**



**There are 2 ways (levels) of precautions to prevent transmission of infection:**

## LEVELS OF PRECAUTIONS

### Standard Precautions

- The foundation for preventing transmission of infectious agents in healthcare settings
- A general set of precautions for patient care and equipment handling
- Universal Respiratory Precautions/Respiratory Hygiene/Cough Etiquette
- Standard Precautions are an interaction driven approach i.e. depend on the level of exposure to potentially infectious body substances

### Transmission-Based (Expanded) Precautions

- Varying set of rules apply based on the patient's clinical presentation or syndrome and likely pathogens
- Used until the infectious cause has been determined and maintained if needed.
- Expanded Precautions are a diagnosis-driven approach i.e. they depend on the diagnosis e.g. rule out TB requires airborne precautions



# Standard Precautions

**Standard precautions are the foundation of infection prevention.**

- Used for **every** patient, **every** encounter
- Intended for the protection of the patients and the health care workers
  - Patients are AT RISK for infection
  - Patients can be the SOURCE of infection



# Standard Precautions: 3 Major Components



Surface Disinfection



Proper use of Personal  
Protective Equipment



Hand Hygiene



# Standard Precautions Through Surface Disinfection

The effective use of disinfectants on surfaces is part of a multi-barrier strategy to prevent healthcare associated infections.

- **All patient care items and surfaces** used for multiple patients contacts must be adequately disinfected between uses
- Visible soiling must be removed
- Clean equipment with a hospital-approved disinfectant used before the next patient contact
- Follow label direction for surface contact/air dry time
- Items you carry with you and/or use frequently are also targets for surface disinfection

**Information in the next slide shows why surface disinfection is so important**



## Length of Time Organisms Can Remain on Surfaces

<b>Organism</b>	<b>Duration of persistence</b>
Acinetobacter	3 days – 5 months
C. difficile	5 months
Enterococcus (including VRE)	4 months
Klebsiella	>30 months
Pseudomonas	16 months; on dry floor – 5 weeks
S. aureus (including MRSA)	7 months
Hepatitis A virus	60 days
Hepatitis B virus	>1 week
HIV	>7 days
Influenza virus	1-2 days
RSV	Up to 6 hours
Norvirus (Cruise Ship virus)	7 days



**Contact/dwell time  
2 minutes**



**Contact/dwell time  
4 minutes**





## **Standard Precautions also involve Universal Respiratory Precautions/Respiratory Hygiene/Cough Etiquette (URP/RH/CE):**

The transmission of SARS-CoV virus in emergency departments by patients and their family members during the widespread SARS outbreaks in 2003 highlighted the need for vigilance and prompt implementation of infection control measures at the first point of encounter within a healthcare setting (e.g., reception and triage areas in emergency departments, outpatient clinics, and physician offices).

### **Elements of URP/RH/CE include:**

- Use of tissues to cover nose & mouth when coughing & sneezing
- Use of soap and water or alcohol hand rub to sanitize hands after coughing or sneezing
- Offering tissues and/or mask to patients and visitors (or even co-workers) who are coughing & sneezing



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# Transmission-based Precautions



## Types of Precautions

- **Airborne**
- **Droplet**
- **Contact:**
  - General Contact
  - Special Contact
  - Enhanced Contact **(NEW!)**
- **Protective**

Be mindful that isolation requirements are followed when the patient is taken from his/her room!





## **Airborne** Precautions are used for diseases such as

- TB
- Chickenpox
- Disseminated herpes zoster in immunocompetent patients
- Localized herpes zoster in immunosuppressed patients
- Measles







## Precauciones de Transmision por Aire

# AIRBORNE PRECAUTIONS

**Visitors:** Please report to Nursing Station before entering this room

**Visitantes:** Por favor ir a la estación de personal antes de entrar esta habitación

<p><b>Hand hygiene</b> upon entering and exiting the patient room</p>		<p>Utilice <u>desinfectante de manos</u> al entrar y salir de la habitación del paciente</p>
<p><b>N95 Mask</b> before entering, Remove mask after leaving room and closing door</p>		<p>Utilice la <u>máscara de la marca N95</u> antes de entrar la habitación; quite la máscara despues de salir de la</p>
<p>Keep Door <b>CLOSED</b> at all times Use anteroom if available</p>		<p>Mantenga la <u>puerta cerrada</u> en todo momento. Use la antesala si está disponible</p>
<p>Limit patient activities outside of room to necessary medical treatment</p>		<p>Limite las actividades del paciente al tratamiento medico necesario</p>

**FOR TERMINAL CLEANING, LEAVE SIGN IN PLACE UNTIL ROOM CLEANED BY EVS**



## Patients on airborne isolation precautions must

- Be placed in a negative pressure room (keeping the door closed allows air to flow in one direction into the patient's room and out into the environment)
- Wear a snugly fitting **surgical mask** when being transported out of his/her room.  
Reason: surgical mask prevents infectious organisms from escaping into the environment. An N95 respirator prevents the wearer from breathing in infectious organisms
- A portable HEPA filter machine may be used **temporarily** while the patient is awaiting placement in a negative pressure room



## A little bit about TB.....



## TB Testing

University Hospital (UH) employees are tested by Employee Health (EH)

Frequency of TB Testing:

All UH employees who are negative for TB infection (PPD or blood test negative) are tested every year

- Employees with positive TB tests are not tested again after their positive tests are known and documented by EH
- Employees with a history of a positive TB test will complete an annual symptom survey

\*\*\*If you have any questions about TB skin tests, call Employee Health at 2-3066\*\*\*





## Exposure follow up

- Evaluation through Employee Health
- Tested for TB if previously negative
- If TB test becomes positive, additional follow up is done



## Follow up of employees with infectious TB

If you have infectious TB

- You will be put off duty until you are no longer infectious
- You must be cleared before you can return to work
- All TB care is confidential. However, your family and friends may be contacted to seek evaluation for TB
- Co-workers will also be tested but your information will not be disclosed to them

\*\*\*Additional information on PPE (Personal protective equipment) use in Module II\*\*\*



## **Droplet** Precautions are used for diseases such as

- Pertussis (Whooping Cough)
- Meningococcal meningitis
- Influenza



## Precauciones de Gotitas

# DROPLET PRECAUTIONS

Visitors: Please report to Nursing Station before entering this room

Visitantes: Por favor ir a la estación de personal antes de entrar esta habitación

Hand hygiene upon entering and exiting the patient room



Utilice desinfectante de manos al entrar y salir de la habitación del paciente

Mask, gown, gloves before entering; Remove PPE upon exiting.



Utilice una maska, bata, guantes antes de entrar la habitación; quite la maska, bata, guantes *antes* de salir de la habitación.

**FOR TERMINAL CLEANING, LEAVE SIGN IN PLACE UNTIL ROOM CLEANED BY EVS**



# Contact Precautions:

## There are 3 levels of contact precautions

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### I. General Contact Precautions used for diseases such as:

- Antibiotic resistant organisms:
  - MRSA
  - VRE
  - ESBL Gram Negative bacteria)
- Communicable skin conditions such as lice and scabies
- Respiratory Syncytial Virus (RSV)
- Varicella-zoster



## Contact Isolation Precautions require:

- Private Room
- Appropriate door signage
- Dedicated, equipment (e.g., stethoscope, blood pressure cuff, thermometer, etc.). If shared equipment is used, it must be cleaned with hospital disinfectant after each use



## Precauciones de Contacto

# CONTACT PRECAUTIONS

**Visitors:** Please report to Nursing Station before entering this room

**Visitantes:** Por favor ir a la estación de personal antes de entrar esta habitación

Use **Hand Hygiene** upon entering and exiting the patient room



Utilice **desinfectante de manos** al entrar a la habitación del paciente

**Gloves and gown** are required before entering room and removed upon leaving\*



Se requiere **guantes y bata** antes de entrar a la habitación y se desechan **al momento** de salir

Use **disposable or dedicated equipment** when possible and **disinfect** equipment



Utilice **equipo desechable o dedicado** cuando sea posible, y **desinfecta** el equipo después de usar

*\* Dependent upon completion of necessary tasks performed by healthcare worker upon exiting the room*

**FOR TERMINAL CLEANING, LEAVE SIGN IN PLACE UNTIL ROOM CLEANED BY EVS**



## II. **Special Contact Precautions** are used for diseases such as

- Clostridium Difficile
- Norovirus

**Special Contact Precautions** require (in addition to guidelines for General Contact Isolation Precautions):

- Hand hygiene with soap and water after contact with the patient and his/her environment
- Use of a bleach-based product for cleaning reusable equipment used on the patient and cleaning of his/her environment








## PRECAUCIONES de CONTACTO ESPECIALES



# SPECIAL CONTACT PRECAUTIONS

Visitors: Please report to Nursing Station before entering this room

Visitantes: Por favor ir a la estación de personal antes de entrar esta habitación

<p><b>Hand Hygiene</b> upon entering and exiting the patient room.</p>		<p>Utilice <b>desinfectante de manos</b> al entrar a la habitación del paciente.</p>
<p>Use <b>SOAP and WATER</b> when exiting.</p>		<p>Lávese las manos <b>con AGUA y JABON</b> al salir de la habitación.</p>
<p><b>Gloves and gown</b> are required before entering room and removed before leaving*</p>		<p>Se requiere <b>guantes y bata</b> antes de entrar a la habitación y se desechan <b>antes</b> de salir</p>
<p>Use <b>disposable or dedicated equipment</b> when possible and <b>disinfect</b> equipment and surfaces with <b>BLEACH</b></p>		<p>Utilice <b>equipo desechable o dedicado</b> cuando sea posible, y <b>desinfecta</b> el equipo y superficies con <b>CLORO</b></p>

\* Dependent upon completion of necessary tasks performed by healthcare worker while exiting the room

**FOR TERMINAL CLEANING, LEAVE SIGN IN PLACE UNTIL ROOM CLEANED BY EVS**



## III. **Enhanced Contact** Precautions are used for diseases such as

- Candida auris
- Carbapenem Resistant Acinetobacter
- Extremely drug resistant (XDR) Gram Negative bacteria

**Enhanced Contact Precautions** require (in addition to guidelines for General Contact Isolation Precautions):

- Hand hygiene with alcohol-based hand sanitizer before and after contact with the patient and his/her environment
- Use of a bleach-based product for cleaning reusable equipment used on the patient and cleaning of his/her environment
- Patients on Enhanced Contact Precautions will be maintained on isolation indefinitely



## Precauciones de Contacto Reforzadas

# ENHANCED PRECAUTIONS

Visitors: Please report to Nursing Station before entering this room

Visitantes: Por favor ir a la estación de personal antes de entrar esta habitación

Hand Hygiene upon entering and exiting the patient room



Utilice **desinfectante de manos** al entrar a la habitación del paciente

Gloves and gown are required before entering room and removed before leaving\*



Se requiere **guantes y bata** antes de entrar a la habitación y se desechan **antes** de salir

Use **disposable or dedicated equipment** when possible and **disinfect** equipment and surfaces with **BLEACH**



Utilice **equipo desechable o dedicado** cuando sea posible, y **desinfecta** el equipo y superficies con **COLORO** despues de usar

\*Dependent upon completion of necessary tasks performed by healthcare worker when exiting the room

**FOR TERMINAL CLEANING, LEAVE SIGN IN PLACE UNTIL ROOM CLEANED BY EVS**



## A little more about *Candida auris* and *Acinetobacter*

*Candida auris* is an emerging fungus that presents a serious global health threat that is of concern for three main reasons:

- It is often multidrug-resistant, meaning that it is resistant to multiple antifungal drugs commonly used to treat *Candida* infections.
- It is difficult to identify with standard laboratory methods, and it can be misidentified in labs without specific technology. Misidentification may lead to inappropriate management.
- It has caused outbreaks in healthcare settings. For this reason, it is important to quickly identify *C. auris* in a hospitalized patient so that healthcare facilities can take special precautions to stop its spread

*Candida auris* can be carried on patients' skin without causing infection, allowing spread to others

- It has been cultured from multiple locations in patient rooms, including both high touch surfaces, such as bedside tables and bedrails, and locations further away from the patient, such as windowsills
- It has also been identified on mobile equipment, such as glucometers, temperature probes, blood pressure cuffs, ultrasound machines, nursing carts, and crash carts. Meticulous cleaning and disinfection of both patient rooms and mobile equipment is necessary to reduce the risk of transmission



*Acinetobacter baumannii* is commonly found in the environment, like in soil and water. However, In the United States, *Acinetobacter* infections rarely occur outside of healthcare settings.

People who have weakened immune systems, chronic lung disease, or diabetes may be more susceptible.

- It can cause blood, urinary tract and wound infections and pneumonia
- It can also “colonize” or live in a patient without causing infections or symptoms, especially in respiratory secretions or open wounds.
- Once it becomes resistant to carbapenem antibiotics, *Acinetobacter* is resistant to most other antibiotics
- It can live for long periods of time on environmental surfaces and shared equipment if they are not properly cleaned
- It can spread from one person to another through contact with these contaminated surfaces or equipment or through person to person spread, often via contaminated hands

**APPENDIX A: Guidelines for Isolation Precautions and Criteria for Discontinuing Isolation for Multi-Drug Resistant Pathogens**

<b>Pathogen</b>	<b>Type of Isolation</b>	<b>Duration of Contact Isolation</b>	<b>Criteria for Discontinuing Isolation</b>
Clostridioides difficile <sup>1</sup>	Special Contact <sup>2</sup>	Minimum of 10 days (special contact)	Completed minimum 10 days of treatment AND resolution of diarrhea for at least 48 hours; Ensure terminal after discharge or transfer; use or enhanced cleaning if patient remains in room after discontinuation of isolation
MRSA <sup>3</sup>	Contact <sup>4</sup>	1 year unless cleared earlier	Off antibiotics for at least 72 hours before surveillance cultures performed AND 1 negative swab from anterior nares
VRE <sup>5</sup>	Contact	1 year unless cleared earlier	Off antibiotics for at least 72 hours before surveillance cultures AND 2 negative swabs from rectum obtained 7 days apart
ESBL E coli, Gram Negatives <sup>6</sup>	Contact	1 year	Resolution of active infection AND at least 12 months since last positive culture.
CRE E coli, Klebsiella oxytoca or pneumoniae or Enterobacter spp. <sup>7</sup>	Enhanced Contact <sup>8</sup>	Indefinitely	Consult Infection Prevention and Control
MDR-Acinetobacter or Carbapenem Resistant <sup>9</sup>	Enhanced Contact <sup>8</sup>	Indefinitely	Consult Infection Prevention and Control
MDR Gram Negatives <sup>10</sup>	Enhanced Contact <sup>8</sup>	Indefinitely	Consult Infection Prevention and Control
Extremely Drug Resistant (XDR) Gram Negatives <sup>11</sup>	Enhanced	Indefinitely	Consult Infection Prevention and Control
VISA or VRSA <sup>12</sup>	Enhanced Contact	Indefinitely	Consult Infection Prevention and Control
Candida auris and associated organisms <sup>13</sup>	Enhanced Contact	Indefinitely	Consult Infection Prevention



**Protective Precautions** are used for all patients diagnosed with immunosuppression based on absolute neutropenia.

**STOP**

**PROTECTIVE PRECAUTIONS**



- No fresh flowers or fruits
  - Regular private room preferred
- Keep door ajar if negative pressure room used
- **DO NOT VISIT IF YOU HAVE A COLD OR FEVER!**
- Visitors must speak with nurse before entering the room.



## Employee Health & Exposure Follow-up

You should report exposure to communicable diseases to the department/person where your work. These conditions include, but not limited to:

- Conjunctivitis (pink eye)
- Tuberculosis
- Chickenpox (Varicella) or Shingles (Herpes zoster)
- Whooping Cough (Pertussis)
- Meningococcal meningitis
- Scabies
- Measles
- Mumps
- Rubella

Infection Prevention & Control will do an investigation to identify persons (employees, patients or visitors) who may need follow up treatment against communicable disease exposure





## Summary

- There are 5 modes of infection transmission: Airborne, Contact (direct & indirect), Droplet, Vehicle (food and other substances) and Vectorborne (animal and insects)
- Standard precautions (a general prevention method) and expanded precautions (to prevent direct contact, airborne and droplet infection) are used at University Hospital
- There are 3 levels of Contact Precautions: General, Special and Enhanced Contact Precautions
- Respiratory Hygiene/Cough Etiquette is another method of standard precautions to prevent transmission of respiratory infections
- Employees are screened for TB infection annually; an exposure investigation is done for inadvertent exposure to TB disease in patients or staff
- Report exposure to communicable diseases to Infection Prevention and Control (IPC) or EH. IPC performs exposure investigations



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## **Module II**

# **Proper Use of Personal Protective Equipment (PPE)**



## Objectives

At the end of this module, you will be able to:

- Know how to put on and remove Personal Protective Equipment (PPE)
- The proper use of a PPE
- General rules for using PPE
- OSHA Regulations on facial hair and use of N95 Respirator



## Regulations and Recommendations for PPE

- OSHA issues workplace health and safety regulations regarding PPE, Employers must:
  - Provide appropriate PPE for employees
  - Ensure that disposable PPE is disposed of after a single use or reusable PPE is cleaned, laundered, repaired and appropriately stored after use
- OSHA also specifies circumstances for which PPE is indicated
- CDC recommends when, what and how to use PPE
- UH staff who wear PPE as part to their tasks/patient interaction are required to undergo annual PPE competency evaluation

# PPE DONNING SEQUENCE

## #1: Hand hygiene



## #2: Gown

Completely secure at neck and tie at waist in back



## #3: Mask/Respirator

Completely adjust & fit check Respirator



## #4: Goggles/Faceshield



## #5: Gloves

Pull over cuffs of gown



# STEPS FOR

## PUTTING ON (DONNING)

&

## REMOVING (DOFFING)

## PERSONAL PROTECTIVE EQUIPMENT

# PPE DOFFING/REMOVAL SEQUENCE

## #1: Gloves

Peel off first glove inside out and fold into gloved hand; tuck finger inside cuff of gloved hand and peel off inside out



## #2 Goggles/Faceshield (if worn)

Note: If patient is on droplet precautions, remove after leaving room/area.



## #3: Gown

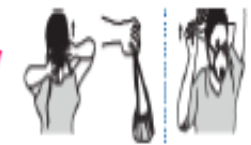
Completely remove tie at neck and waist



## #4 Mask/Respirator

Always remove forward away from face

NOTE: For Airborne Isolation, remove N95 Respirator after exiting room



## #5: Perform Hand Hygiene

## Remember

**GMGG** (Donning)

**GGGM** (Doffing)

### **DONNING**

#### Hand hygiene

Gown

Mask/Respirator

(Goggles)

Gloves

### **DOFFING**

Gloves

(Goggles)

Gown

Mask/Respirator

#### Hand Hygiene

## **QUICK TIPS**

- Keep hands away from face
- Limit surfaces touched
- Change gloves when torn or heavily contaminated

### GLOVES

- Outside of gloves are contaminated!
- If your hands get contaminated during glove removal, immediately wash your hands or use hand sanitizer followed by soap and water as soon as possible
- Using 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

### GOWN

- Gown front and sleeves are contaminated!
- If your hands get contaminated during gown removal, immediately wash your hands or use hand sanitizer followed by soap and water as soon as possible
- Unfasten gown ties, taking care that sleeves don't contact your body when reaching for ties
- Pull gown away from neck and shoulders, touching inside of gown only
- Turn gown inside out. Fold or roll into a bundle and discard into a waste container



## Correct use of disposable gloves

### DO

- Use for medical procedures
- Use only once on a single patient
- Remove as soon as possible if they are contaminated, torn, punctured or damaged
- Remove as soon as possible after completing procedure
- Change between tasks on the same patient e.g. between trach care and Foley care

### DON'T

- Wash or decontaminate for reuse
- Wear at Nurses' station unless carrying a specimen for processing



## Correct use of utility gloves

- Used for some housekeeping and Central Service activities
- **May** be cleaned or decontaminated for reuse
- **Do not** reuse utility gloves if they are damaged or torn





## Correct use of fluid resistant gowns

### DO

- Use when splashing or soiling of clothing is likely.
- Remove after completing procedure.
- Remove soiled clothing as soon as possible. Replace with clean uniform or scrubs (if a change of clothing is not available)

### DON'T

- Wear out of the work area
- Wear at nurses' station



## Removing a Mask or Respirator

### A. Mask

- Ties: untie the bottom, then top tie;  
Loops: slide the bottom loop off first, followed by top loop
- Remove forward away from face. **Never** slide back over face as this exposes you to contamination
- Discard



### B. N95 Respirator

- Lift the bottom elastic over your head first
- Then lift off the top elastic
- Slide forward away from face as in A, above
- Discard



## Correct use of face protection

- **Do** use fluid resistant masks and eye protection (splash guards or goggles) if splashing to the eyes, mouth or nose is likely
- N95 respirator prevents TB from being breathed in; surgical mask prevents TB from escaping into the environment. Therefore, only provide surgical mask to the patient
- Visitors may use a surgical mask or an N95 respirator. Visitors are not fit tested for the respirator



## Where to remove Personal Protective Equipment

- Except for respirator, remove PPE at doorway or in anteroom
- Remove respirator after leaving patient room and closing door

**PERFORM HANDS HYGIENE IMMEDIATELY AFTER REMOVING ALL PPE**



## Federal and State public employee OSHA (PEOSH) guidelines on facial hair and N95 respirators

- Federal OSHA and State PEOSH laws ban the use of N95 respirators by employees with facial hair (such as full beards and long sideburns) if the hair prevents the respirator from creating a tight seal around the face
- Employees must ensure that they are clean shaven (no beard/hair) wherever the seal (edges of the respirator) touches the face
- Hair inside the respirator (such as a small amount of hair around the mouth and chin) does not prevent a good seal

\*\*For further reading about the effect of facial hair on respiratory facepiece fit, contact Infection Prevention and Control



## General rules for use of Personal Protective Equipment

**Do** always inspect PPE before, during and after use

**Do** clean and maintain PPE properly

**Do** repair or discard any equipment that's damaged or flawed

**Do** replace PPE as soon as possible if it becomes saturated by blood or other body fluids

**Do** always remove PPE before leaving the work area

**Do** remove PPE carefully to avoid contamination of clothing and skin



## Summary

- Careful handling of Personal Protective Equipment is an important step in preventing the spread of infection
- The order that you put on and take off a PPE decreases the risk of infection
- Following basic guidelines for checking and maintaining equipment ensures your safety.
- Employees who wear N-95 respirators must receive annual respiratory protection education and annual respirator fit testing
- Facial hair that interrupts the seal between the face and the N95 respirator is forbidden by OSHA



## Module III

### HAND HYGIENE: 5 MOMENTS of HAND HYGIENE



**Ignaz Philipp  
Semmelweis  
(1818-65)**





## Objectives

- **At the end of this session, you will be able to:**
- **Explain the purpose of hand hygiene in health care settings**
- **State the recommended time for hand washing**
- **Describe the World Health Organization (WHO) 5 Moments for Hand Hygiene**
- **Differentiate between the Healthcare area and the Patient Zone**
- **State the recommended time for alcohol-based hand rub**
- **List examples of when hand hygiene is required**
- **Explain the policy on artificial and long fingernails**



## Hand hygiene (Antisepsis)

Hand hygiene is the single most important precaution for preventing the spread of infection.

### Definition of antisepsis:

-Removal of harmful germs

Hand hygiene keeps you from transferring germs from your hands to other areas of your body or other surfaces you touch

### Procedure

If hands are visibly soiled with blood or body fluids, wash using soap, water and vigorous friction

- If hands are not visibly soiled, use waterless hand cleanser (alcohol-based hand rub)
- Use approved hand lotion (while at work) to prevent drying, chapping and hand dermatitis

Further Optional Reading: WHO Hand Hygiene guidelines



## Why should you clean your hands?

- Any healthcare worker, caregiver or person involved in patient care needs to be concerned about hand hygiene
- Therefore hand hygiene does concern **you!**
- **You** must perform hand hygiene to:
  - **Protect the patient** against harmful germs carried on **your** hands or present on his/her own skin
  - **Protect yourself** and the healthcare environment from harmful germs



## WHO 5 MOMENTS (INDICATIONS) FOR HAND HYGIENE

### The 5 Moments

### Consensus recommendations

#### *WHO Guidelines on Hand Hygiene in Health Care 2009*

1. Before touching a patient

Before and after touching the patient

2. Before clean / aseptic procedure

Before handling an invasive device for patient care, regardless of whether or not gloves are used  
If moving from a contaminated body site to another body site during care of the same patient

3. After body fluid exposure risk

After contact with body fluids or excretions, mucous membrane, non-intact skin or wound dressing  
If moving from a contaminated body site to another body site during care of the same patient  
After removing sterile or non-sterile gloves

4. After touching a patient

Before and after touching the patient  
After removing sterile (II) or non-sterile gloves

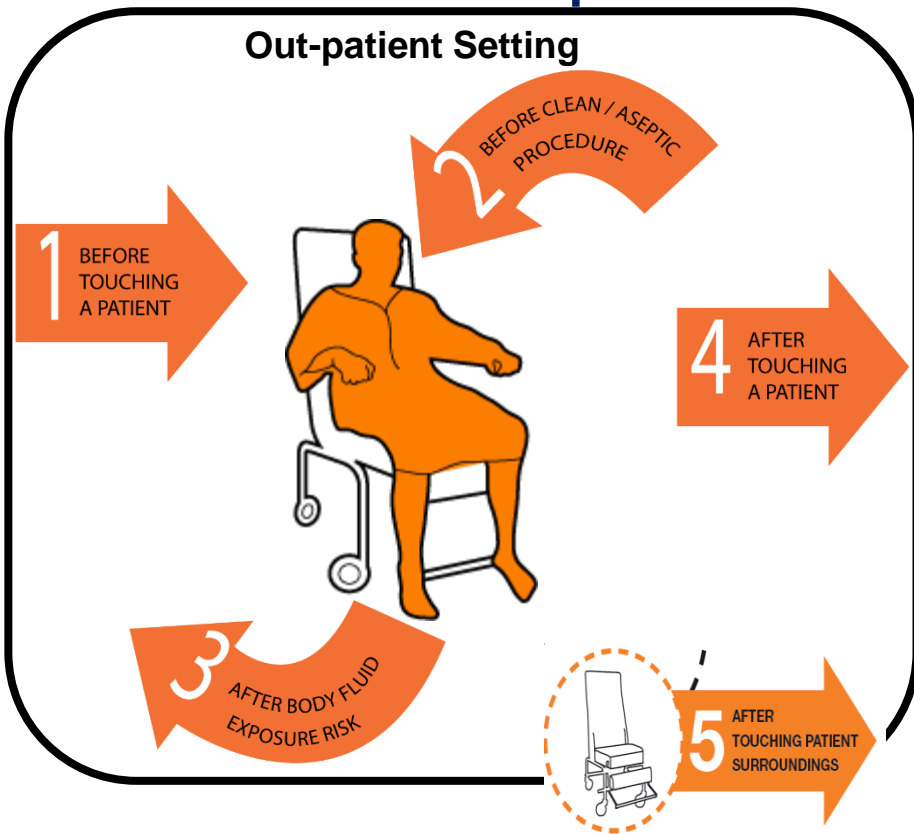
5. After touching patient surroundings

After contact with inanimate surfaces and objects (including medical equipment) in the immediate vicinity of the patient  
D.f) after removing sterile gloves (II) or non-sterile gloves

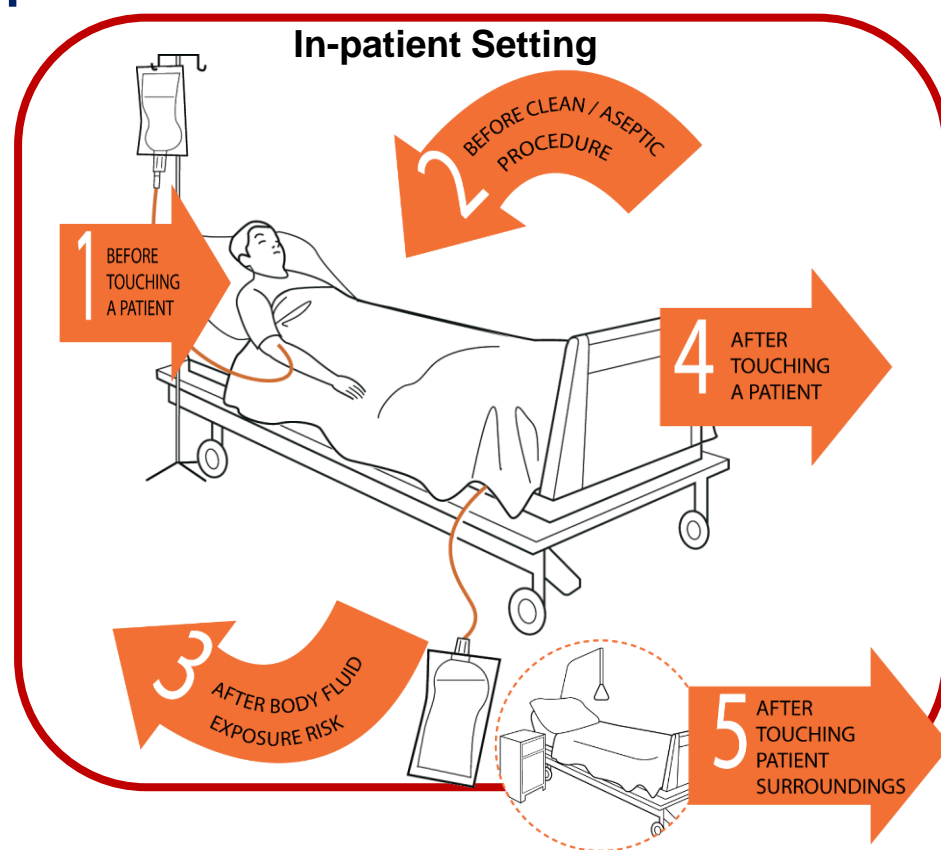


## The 5 Moments apply to any setting where health care involving direct contact with patients takes place

### Out-patient Setting



### In-patient Setting



'Based on the 'My 5 moments for Hand Hygiene', URL:  
<http://www.who.int/gpsc/5may/background/5moments/en/index.html>  
tml © World Health Organization 2009. All rights reserved.'



## Definitions of **patient zone** and **healthcare area**

Focusing on a single patient, the healthcare setting is divided into two virtual geographical areas, the **patient zone** and the **healthcare area**.

**Patient zone:** Includes the patient and some surfaces and items that are temporarily and exclusively dedicated to him or her such as all inanimate surfaces that are touched by or in direct physical contact with the patient e.g.

- bed rail
- bedside table
- bed linen
- chairs
- infusion tubing
- Monitors
- knobs and buttons on monitors or other patient care equipment
- other medical equipment



**Healthcare area:** Includes all surfaces in the healthcare setting outside the patient zone i.e. not touched by, or in physical contact with, the patient

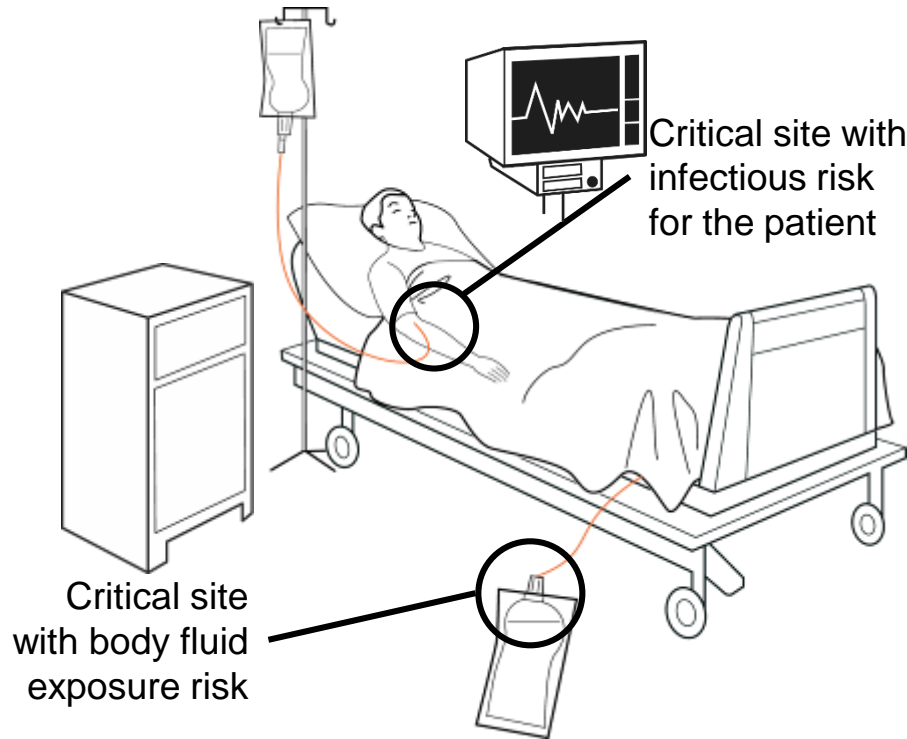
A clear example would be touching the door handle and then shaking the patient's hand:

- The door handle belongs to the healthcare area outside the patient zone, and the patient's hand belongs to the patient zone
- Therefore hand hygiene must take place after touching the door handle and before shaking the patient's hand
- The healthcare area is contaminated with microorganisms that might be foreign and potentially harmful to the patient
- In this example, hand hygiene is not required if only the door handle is touched and no entry into the patient zone occurs



## HEALTHCARE AREA

### PATIENT ZONE



'Based on the 'My 5 moments for Hand Hygiene', URL: <http://www.who.int/gpsc/5may/background/5moments/en/index.html> © World Health Organization 2009. All rights reserved.'





## Hand Hygiene

**Handwashing: should take 40-60 seconds from turning on faucet to drying hands**

- *Average time usually performed by healthcare workers: <10 seconds*

**Alcohol-based hand rubbing: should take 20–30 seconds from applying the sanitizer until it's fully absorbed into the skin**



## Hand hygiene and glove use

- The use of gloves does not replace the need for cleaning your hands!
- You should perform hand hygiene before putting on and after removing gloves
- You should remove gloves to perform hand hygiene, when an indication occurs while wearing gloves
- You should wear gloves only when indicated otherwise they become a major risk for germ transmission



# How do I perform Hand Hygiene?



1 Palm to Palm



2 Right palm over left dorsum, then left palm right over dorsum



3 Palm to palm fingers interlaced



4 Backs of Fingers to opposite palms with fingers interlocked



5 Rotational rubbing of right thumb clasped in left palm and vice versa



6 Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa



## Fingernail Guidelines

### Natural fingernails

- Tips no longer than  $\frac{1}{4}$  inches
- Smooth without rough edges

### Nail polish

- Cannot be chipped or peeling

### Artificial fingernails

- No artificial nails or decorations such as nail tips, nail gel, acrylic nails, nail jewelry are permitted.





## Summary

- Antisepsis is the removal of harmful germs.
- Hand antisepsis is the single most important step in controlling the spread of infections.
- There are important guidelines for artificial, natural and polished nails.
- You **MUST** use soap and water after touching bodily fluids with bare hands or using the toilet or when working with a patient on Special Contact precautions
- Use alcohol hand rub (preferred) or soap and water after patient care, removing gloves, smoking, applying makeup, handling contact lenses, coughing or sneezing.



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# Module IV

## OSHA Bloodborne Pathogens Standard & Sharps Safety



## Objectives:

- Explain General aspects of the Bloodborne Pathogens Standard (BBPS)
- List key organisms covered under this law and modes of transmission
- Identify the location of the BBPS Exposure Control Plan
- List methods to prevent exposure to bloodborne pathogens
- Describe follow up for exposure to bloodborne pathogens
- Name the Federal, OSHA and State laws requiring use of safety sharps
- List 4 safety sharp devices used at UH
- Identify where information on safety sharps is located



# OSHA bloodborne Pathogen Standard

- OSHA Law – Effective 07/1992
- Based on Universal Precautions (AKA Standard Precautions)
- Blood & other body fluids treated as infectious until proven noninfectious

## Focuses on prevention of infection with:

- HIV
- HBV
- HCV
- Syphilis







## OSHA BLOODBORNE PATHOGEN STANDARDS

### Overview

- There is no sure way to know if a patient is infectious with a blood borne organism on admission
- The Occupational Safety and Health Administration (OSHA) requires that employers protect employees with exposure to blood and body fluids from potential infection by organisms such as **HIV, Hepatitis B, Hepatitis C and Syphilis**
- The facility must have an Exposure Control Plan in place to outline how it will protect employees from these agents



# Bloodborne Pathogens Exposure Control Plan

## **Purpose:**

To provide a safe working environment and reduce the risk of exposure to bloodborne pathogens

**The Exposure Control Plan can be accessed by clicking on the following link. Login is required:**

<https://universityhospital.ellucid.com/documents/view/2408/5931>





# Bloodborne Pathogens Exposure Control Plan

- Personal Protective Equipment
- Job Task List
- Engineering Controls
- Work Practice Controls
- Post Exposure Management
- Bio-hazardous Labeling
- Waste Management
- bloodborne Pathogen Training

In the event of a blood or  
other infectious spill

**Call 2-1500**



## Engineering Controls



Sharps  
Containers



Safety needles  
(self-sheathing)



Needle-less IV  
system

**FOCUS ON SAFETY!**



## Exposure Control Plan

- The Exposure Control Plan (ECP) outlines methods are in place to minimize employee risk
  - Elements of the ECP include
    - Work Practice Controls
    - Administrative Controls (policies & procedures)
    - Engineering Controls
    - Exposure Follow Up
- Training

The plan is located in the MCN policy manual on the hospital intranet site



## How bloodborne pathogens are transmitted in the workplace

- Cuts
- Needle sticks
- Splashes to mucous membranes (eyes, nose and mouth)
- Contamination of broken skin (burns, acne lesions, wounds, dermatitis, etc.)

\* Further Optional Reading: OSHA guidelines on bloodborne pathogens\*



## **Exposure Follow Up: Action After Exposure to BBP**

- As soon as possible report Employee Health (EH) between 7:00 a.m.-3:00 p.m.
- Report to the Emergency Department after 3:00 p.m. or when EH is closed
- Complete an incident report
- Staff who cannot report to EH or the ED as soon as possible, will be given one dose of post-exposure medication dispensed by the Pharmacy



## Post-Exposure Prophylaxis

**HIV**- 2 or 3 medications (depending on extent of exposure) in pill form taken for 4 weeks

**HBV**- Immune globulin and vaccine if not immune to virus

**HCV**- Currently there is no recommended treatment for post exposure prophylaxis. Blood test will be done through periodic follow up in EHS

**Syphilis** – one dose of antibiotics will be offered if needed

**Tetanus vaccine**- if stuck with needle or cut by instrument and vaccine not received within the last 10 years

All medical records are kept for duration of employment + 30 yrs. after separation from employment





## Hepatitis B Vaccine

Hepatitis B vaccine is available free of charge through employee health services.

Healthcare workers who should be immunized against HBV include, but are not limited to

• Nurses	• Doctors
• Physician assistants	• Nursing assistants
• EMS personnel	• Therapists and assistants (all disciplines)
• Technicians and assistants (all disciplines)	• Transporters
• Maintenance Services	• Environmental Services



## Standard Precautions (General Principles)

- **Do** treat all blood and body fluid from patients as though they may be infected with a bloodborne pathogen.
- **Do** use Standard Precautions every time you anticipate contact with
  - body fluids (blood, secretions, excretions)
  - non-intact skin
  - mucous membranes of patients

Note: Additional information on PPE (personal protective equipment) use is in Module II



## Work Practice Controls

OSHA also assigns individual responsibility in the form of Work practice Controls. These are habits that you as an individual must develop to prevent yourself from becoming infected with a bloodborne pathogen

### DO

- Minimize splashing, spraying or spattering of blood or body fluids
- Handle soiled patient care equipment with care
- Clean reusable equipment before use on a patient
- Handle soiled linen as little as possible
- Transport specimens in closed containers labeled with the biohazard symbol – wear gloves

### DON'T

- Keep food or drink in places where blood or other potentially infectious material are handled or may be present such as:
- Nurses' stations, workstations on wheels, work carts, specimen refrigerators, countertops



## Administrative controls

**Do** follow all policies & procedures to minimize your risk of exposure to bloodborne pathogens



## Engineering Controls

### DO

- Dispose of contaminated sharps in appropriate puncture-resistant containers after use
- Always activate the safety mechanism if present

### DON'T

- Bend, recap or break needles after use
- Let sharps containers overfill – call Environmental Services at 2-1500 when container is 2/3 full



## Regulated medical waste

**Do** treat items soaked with blood or body fluids as regulated medical waste, and dispose in red bags.

**Do** promptly contact Environmental Services at 2-1500 to clean blood and body fluid spills.



## Hazard Identification

Signs such as the biohazard symbol at right must be on all containers where blood/body fluids may be carried or stored

Red bags/containers are also visual indicators that bloodborne pathogens may be present in that item.





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# **SHARPS SAFETY AT UNIVERSITY HOSPITAL**





## State and Federal Sharps Safety Laws

### **NJ Department of Health and Senior Services Needle Safety Law:**

Requires a Sharps Safety Committee (SSC) with at least 50% membership being end users (employees who will use these devices on a daily basis).

- UH SSC formed in 2000 with representation from Nursing, Physicians, Laboratory, Ambulatory Care, Radiology, EMS and Administration.

### **Federal Needlestick Safety Law:**

Requires healthcare personnel to be protected against sharps injury.

Revised OSHA Bloodborne Pathogens Standards require use of safety sharps with input from end users.



## Waivers for use of non-safety sharps

- **Emergency waiver**

A health care worker (HCW) may use a non-safety sharp in an emergency but must report it to the SSC for incident review.

- **Nonemergency waiver**

A HCW may request a committee waiver to use a non-safety sharp for a specific procedure or class of patients.



## **Reporting problems with safety sharp devices**

- Employees should report problems with safety sharps to their supervisor or a member of the Sharps Safety Committee. This allows for investigation into the problem
- Reporting allows the committee to identify improperly performing sharps or sharps that have been recalled for poor performance

## **Location of information on sharps safety**

Information on safety sharps is located in the Exposure Control Plan which could be accessed on the MCN policy site on the intranet



## Summary

- There is no way to know if a patient is infected with a blood borne pathogen (BBP)
- BBP's include HIV, Hepatitis B, Hepatitis C and Syphilis
- The Exposure Control Plan is located in the Infection Control Policy and Procedure Manual
- Transmission occurs through the skin or mucous membranes
- In the event of exposure, report it immediately, and then know and follow all available post exposure procedures.
- OSHA covers all health workers and requires that Hepatitis B vaccine be offered to employees with Blood & Body fluid exposure risk.
- In addition to standard practices, you must know all work practice, administrative and engineering controls that help prevent infection.
- Carefully dispose of ALL medical waste.
- Know your biohazard signs.



## Summary

- There are New Jersey, Federal and OSHA laws and procedures to protect against injury by sharps.
- Waivers can be obtained for the use of non-safety sharps.
- Follow reporting procedures in the event of problems with sharps.
- Know standard safety sharps, and how to identify the activated and un-activated state.



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# Module V

## Hospital Acquired Infection Prevention



## Healthcare Associated Infections (HAIs)

### What are they?

- HAIs include bloodstream infections (BSI), urinary tract infections (UTI), pneumonia and surgical site infections
- When a device such as a central line, Foley catheter or ventilator is present, they are called
  - Central line-associated BSI (CLABSI)
  - Catheter-associated UTI (CAUTI)
  - Ventilator-associated pneumonia (VAP)



# Objectives

At the end of this module you will be able to:

- Describe how HAIs can be prevented





The problem with these infections is reflected in high mortality rates and cost of care e.g. a 2007 CDC study showed that

- 1.7 million HAIs occurred in hospitals
- 99,000 resultant deaths
- \$26-33 billion dollars in healthcare costs

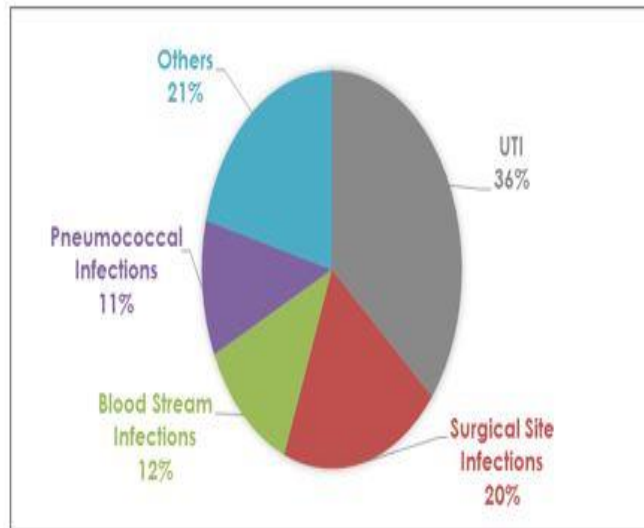
How could this be prevented?

It's simple: Implement the best practices that are known to lead to up to 70% or more reduction in HAIs



## Percentage of each HAI identified in hospital settings:

Common HAIs in Acute Care Settings



Source: Technavio Research

## Of the **99,000 ANNUAL DEATHS** from HAIs:

**35,967** are from pneumonia

**30,665** from bloodstream infections

**13,088** from urinary tract infections

**8,205** from surgical site infections; and

**11,062** from infections at other sites.

(Klevens 2007)



## **Interventions for C. difficile Infection (CDI) Prevention**

Interventions include

- Antibiotic management
- Stringent/enhanced environmental cleaning with bleach products
- Reinforcement of hand washing with soap and water after contact with patient or environment
- Appropriate and timely testing and patient isolation



## Summary

The common HAIs identified in hospitals include BSIs, UTIs, SSIs, C. difficile infection and VAPs

These HAIs result in increased morbidity, mortality and cost of treatment

Best practice interventions have been shown to decrease HAIs