



INFECTION CONTROL UPDATE



Infection Prevention & Control

The Program at University Hospital consists of surveillance, effectiveness assessments, and staff education. All of these efforts result in a safer health care environment for our patients and staff.

Main Office Extensions 2-5790 or 2-7081





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



Proper use of Personal Protective Equipment





So Why All the Fuss About Hand Hygiene?

Most common mode of transmission of pathogens is via hands!

- Hand hygiene reduces hospital-acquired infections
- Hand hygiene reduces spread of antimicrobial resistance

University Hospital now follows the World Health Organization's 5 Moments for Hand Hygiene



Golden Rules for Hand Hygiene

Hand hygiene must be performed exactly where **you** are delivering health care to patients (at the point-of-care)

During health care delivery, there are 5 moments (indications) when it is essential that **you** perform hand hygiene ("**My 5 Moments for Hand Hygiene**" approach)



Golden Rules for Hand Hygiene (continued)

To clean your hands, **alcohol-based handrub is preferred over handwashing with soap and water**. Why? Because it makes hand hygiene possible right at the point-of-care, it is **more effective**, faster, and better tolerated.

You should wash your hands with soap and water when **visibly soiled** and with exposure to following suspected pathogens: *C. difficile*, *Bacillus anthracis*, Norovirus, Rotavirus



Golden Rules for Hand Hygiene (continued)

You must perform hand hygiene using the appropriate technique and time duration.



Alcohol hand sanitizer

Rub your hands together until the product is fully absorbed into the skin for a minimum of 20-30 seconds.

Soap and Water

For soap and water wash, hand hygiene from turning on to turning off faucet should take at least at least 40-60 seconds.

(Need a timer? Hum the "Happy Birthday" song from beginning to end twice.)



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



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



UNIVERSITY HOSPITAL Newark, New Jersey The geographical conceptualization of the transmission risk



'Based on the 'My 5 moments for Hand Hygiene', URL: http://www.who.int/gpsc/5may/background/5moments/en/index.h 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
- 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



How do I perform Hand Hygiene?



Palm to Palm



Backs of Fingers to opposite palms with fingers interlocked



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



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



Palm to palm fingers interlaced



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



Hand Hygiene and Glove Use

- The use of gloves <u>does not</u> replace the need for cleaning your hands!
- You should remove gloves to perform hand hygiene.







Fingernail Guidelines

Natural fingernails

- Tips no longer than 1/4 inches
- Smooth without rough edges

Nail polish

• Cannot be chipped or peeling

Artificial fingernails

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





Personal Protective Equipment (PPE)

- PPE is used to protect YOU and other HCWs from exposure to pathogens that affect our patients
- PPE use is based on the behavior of the patient and task to be performed
- Remember, it is **NOT** PPE if it doesn't fit properly!
- Use PPE carefully **DON'T** spread contamination
- **DON'T** wear PPE outside treatment area
- Remember to perform hand hygiene before donning and after doffing



Personal Protective Equipment (PPE) (continued)

- Don before contact with the patient
- Remove and discard carefully, either at the doorway or immediately outside patient room
- Remove respirator outside room
- Again, perform hand hygiene
 before donning and after doffing



PPE DONNING SEQUENCE

#1: Hand hygiene



#2: <u>Gown</u>

Completely secure at neck and tie at waist in back



#3: Mask/Respirator Completely adjust & fit check Respirator



#4: Goggles/Faceshield



#5: <u>Gloves</u> Pull over cuffs of gown



STEPS

FOR

PUTTING ON (DONNING) & REMOVING (DOFFING)

PERSONAL PROTECTIVE EQUIPMENT

PPE DOFFING/REMOVAL SEQUENCE

#1: Gloves

worn)

room/area.

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

Note: If patient is on droplet precautions,

remove after leaving





#3: <u>Gown</u> Completely remove tie at neck and waist



#4 <u>Mask/Respirator</u> Always remove forward away from face NOTE: For Airborne Isolation, remove N95 Respirator after exiting room

#5: Perfomr 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 you hands or use hand sanitizer followed by soap and water as soon as possible
- Using gloved hand, grasp the palm area of he 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

<u>GOWN</u>

- •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



Take Home Points

- Hand hygiene and proper PPE prevents hospital-acquired infections
- Be responsible about hand hygiene
- Be responsible about proper PPE
- Help promote a culture where best practices for patient safety are adhered to and encouraged
- Educate patients and families/visitors about infection transmission and hand hygiene



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.
- A hospital-approved detergent disinfectant must be applied and allowed to air dry 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.





How long are surfaces contaminated?

Organism	Duration of persistence
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



Transmission-based Precautions*

***NOTES:**

Contact precautions are now divided into 3 levels: 1) General Contact precautions 2) Special Contact Precautions 3) Enhanced Contact precautions

University Hospital is in the process of implementing new isolation signs



Types of Precautions

- Airborne
- Droplet
- Contact:
 - General Contact
 - Special Contact
 - Enhanced Contact
- Protective





Airborne Precautions are used for diseases such as

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



Droplet Precautions are used for diseases such as

- RSV
- Pertussis
- Meningococcal meningitis
- Influenza





Contact Precautions: There are 3 levels of contact precautions

- I. <u>General Contact Precautions</u> 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



In general, 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
- Education for the patient/representative should be documented in the electronic medical record



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 <u>bleach-based product for cleaning</u> reusable equipment used on the patient and cleaning of his/her environment



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



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 though person to person spread, often via contaminated hands

for Multi-Drug Resistant Pathogens

Pathogen	Type of	Duration of	Criteria for Discontinuing Isolation
	Isolation	Contact	
Clostridioides difficile ¹	Special Contact ²	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
MRSA ³	Contact ⁴	1 year unless cleared earlier	Off antibiotics for at least 72 hours before surveillance cultures performed AND 1 negative swab from anterior
VRE ^s	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 ⁶	Contact	1 year	Resolution of active infection AND at least 12 months since last positive culture.
CRE E coli, Klebsiella oxytoca or pneumoniae or	Enhanced Contact [®]	Indefinitely	Consult Infection Prevention and Control
MDR- Acinetobacter or Carbapenem Resistant	Enhanced Contact ⁸	Indefinitely	Consult Infection Prevention and Control
MDR Gram Negatives ¹⁰	Enhanced Contact [®]	Indefinitely	Consult Infection Prevention and Control
Extremely Drug Resistant (XDR) Gram Negatives ¹¹	Enhanced	Indefinitely	Consult Infection Prevention and Control
VISA or VRSA ¹²	Enhanced Contact	Indefinitely	Consult Infection Prevention and Control
Candida auris and associated organisms ¹³	Enhanced Contact	Indefinitely	Consult Infection Prevention





Influx of Potentially Infectious Patients

Hospital staff and specific hospital departments will be notified about infectious public health alerts, such as the start of seasonal influenza, and other potential public health warnings from the local health department, CDC (Centers for Disease Control), or WHO (World Health Organization) via different modes of communication including, but not limited to:

- E-mail
- Notices posted in various hospitals location: lobby, elevators, cafeteria, hospital intranet
- Through department heads, department chairs and/or chiefs of service



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







URINARY TRACT INFECTIONS Urinary catheter Urinary invasive procedures Advanced age Severe underlying disease Urolitiasis Pregnancy Diabetes	34% 1 Most comm sit LACK ^{II} associated in and tHANE	13% LOWER RESPIRATORY TRACT INFECTIONS Mechanical ventilation Aspiration Nasogastric tube Central nervous system depressants Antibiotics and anti-acids Prolonged health-care facilities stay Malnutrition Advanced age Surgery Immunodeficiency
SURGICAL SITE INFECTIONS Inadequate antibiotic prophylaxis Incorrect surgical skin preparation Inappropriate wound care Surgical intervention duration Type of wound Poor surgical asepsis Diabetes Nutritional state Immunodeficiency Lack of training and supervision	HYGIEI occurrence infection 17% 1	 BLOOD INFECTIONS Vascular catheter Neonatal age Critical care Severe underlying disease Neutropenia Immunodeficiency New invasive technologies Lack of training and supervision



Catheter Safety

Catheters of any type should be used as sparingly as possible!

Catheter Associated Urinary Tract Infection (CAUTI):

A hospital quality indicator – rates reported to hospital quality council, UHC and DOH

- Formation of bio-films by urinary pathogens is common on the surfaces of catheters
- Bacteria within bio-films resistant to antimicrobials





CDC Indications for In-dwelling Urinary Catheter Use

Table 2. A. Examples of Appropriate Indications for Indwelling Urethral Catheter Use 1-4

Patient has acute urinary retention or bladder outlet obstruction

Need for accurate measurements of urinary output in critically ill patients

Perioperative use for selected surgical procedures:

- Patients undergoing urologic surgery or other surgery on contiguous structures of the genitourinary tract
- Anticipated prolonged duration of surgery (catheters inserted for this reason should be removed in PACU)
- Patients anticipated to receive large-volume infusions or diuretics during surgery
- Need for intraoperative monitoring of urinary output

To assist in healing of open sacral or perineal wounds in incontinent patients

Patient requires prolonged immobilization (e.g., potentially unstable thoracic or lumbar spine, multiple traumatic injuries such as pelvic fractures)

To improve comfort for end of life care if needed



CDC Bladder Bundle

- Do not use the indwelling catheter unless you must!
- Condom or intermittent catheterization should be used in appropriate patients
- Bladder ultrasound may avoid indwelling catheterization
- Aseptic insertion and proper maintenance is paramount.
- Early removal of the catheter using reminders or stop orders appears warranted.



Central Venous Catheterization (CVC)

Common indications for Central Venous Catheterization:

- Hemodynamic monitoring
- Administration of drugs likely to induce phlebitis
- Temporary cardiac pacemaker
- Hemodialysis
- Lack of peripheral venous access

Relative contraindications to CVC:

- Inexperience, unsupervised operator
- Local infection
- Distorted local anatomy
- Coagulopathy
- Previous radiation therapy
- Suspected proximal vascular injury

Depending on the availability and urgency, ultrasound guided techniques should be considered in these scenarios.

dialysis

Catheter

oht atriun



Central Line Associated Infections (CLABSI)

Central Line Insertion Bundle

- Hand hygiene performed
- Appropriate skin prep
 - Chlorhexidene gluconate (CHG) for patients ≥ 2 months old
 - Povidone iodine, alcohol, CHG, or other specified for children <2 months old
 - Skin prep agent must completely dry before insertion
- 5 maximal sterile barriers used by operator and assistant
 - Sterile gloves
 - Sterile gown
 - Сар
 - Mask
 - Large sterile drape
- All other persons in room should wear a mask



Central Line Associated Infections (CLABSI)

- Optimal catheter site selection, with subclavian vein as the preferred site for non-tunneled catheters
- Daily review of line necessity, with prompt removal of unnecessary lines
- Femoral lines placed only in emergency with site change within 24 hours of insertion





Prevention: Surgical Site Infection

- Prophylactic antibiotic received within one hour prior to surgical incision (2 hours for vancomycin)
- Prophylactic antibiotic selection for surgical patients
- Prophylactic antibiotics discontinued within 24 hours after surgery end time
- Cardiac surgery patients with controlled 6 a.m. postoperative serum glucose
- Surgery patients with appropriate hair removal
- Urinary catheter removed on postoperative day 1 or postoperative day 2 (with day of surgery being day zero)
- Surgery patients with peri-operative temperature management



Prevention: Ventilator Associated Event (VAE)

Quality Indicators

- Head of bed elevated to 30-45 degrees
- Oral care every 4 hours
- Daily "sedation vacation" and daily assessment of readiness to extubate
- Peptic ulcer prophylaxis
- DVT prophylaxis





OSHA Blood-borne 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





Blood-borne Pathogens Exposure Control Plan

Purpose:

To provide a safe working environment and reduce the risk of exposure to blood-borne 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





Blood-borne Pathogens Exposure Control Plan

- Personal Protective Equipment
- Job Task List
- Engineering Controls
- Work Practice Controls
- Post Exposure Management
- Bio-hazardous Labeling
- Waste Management
- Blood-borne 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!





Influenza Vaccination

Vaccination is the primary measure to prevent infection or development of illness from influenza. It limits transmission of influenza and prevents complications from influenza

 University Hospital requires annual influenza vaccination for all staff unless there is a medical or religious waiver





Refusal of Vaccine

Once the flu season has been declared (based on widespread activity in the community/state),

Employees, medical staff and volunteers who are permitted to decline vaccination shall wear a surgical mask once prevalence of influenza in the community is declared by the state Commissioner of Health until the flu season is declared over.



IP & C Policies are located on UHNET at the following web address:

https://universityhospital.ellucid.com

Thank You