

Trainee Orientation

Infection Prevention

Infection Prevention

LAJ VAMC

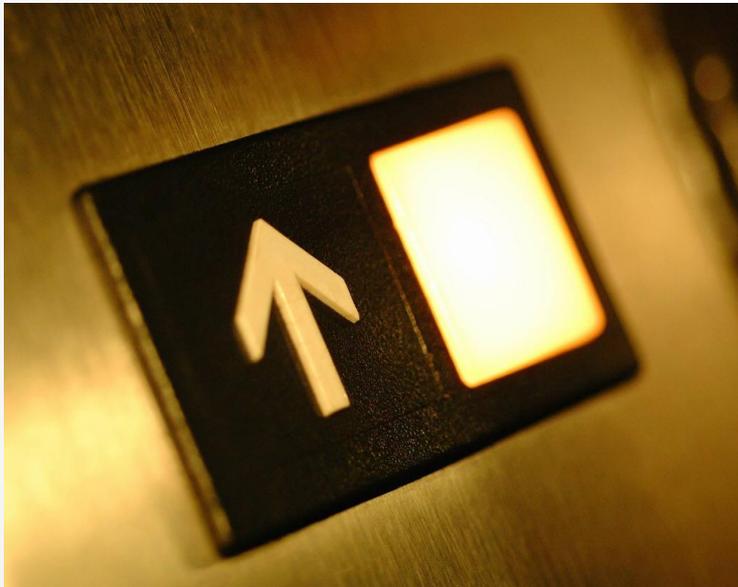
Clarksburg, WV

Objectives

- Chain of Infection
- MRSA
- Multi-drug resistant organisms
- Transmission based precautions
- OSHA and Standard Precautions
- Exposure Incidents
- Cleaning and disinfection principles
- Hand Hygiene

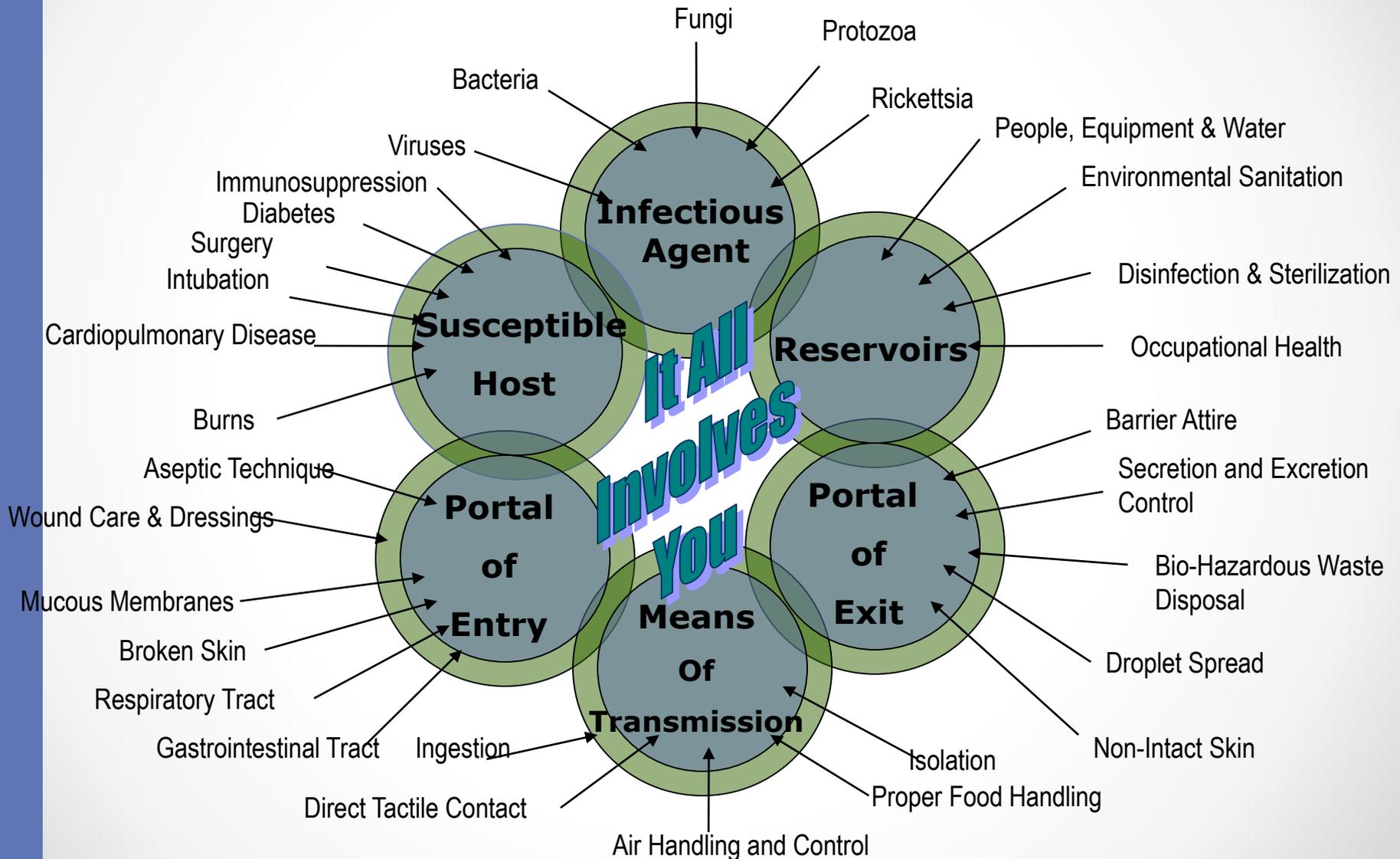
HAI (Hospital Associated Infections)

Costs – Increasing



- Estimated \$9.8 billion spent each yr. on HAI's
- One of the top ten causes of death in the U.S.
- Cost to Hospitals
- C. Difficile HAI \$11,285
- SSI \$20,785 –most common HAI
- VAP (vent. associated pneu.) \$40,144/case
- Surgical Site Infection \$15,646
- Bloodstream Infection (CLABSI) \$45,814
- Average attributable **cost** of an average HAI at **\$15,275.**

THE CHAIN OF INFECTION



What is MRSA?

- MRSA is an acronym for Methicillin-Resistant Staphylococcus aureus.
- MRSA is a bacterium that is resistant to usual antibiotics and may potentially lead to serious infection in some patients.
- Today MRSA is one of the most rapidly growing and virulent healthcare associated infections.

How is MRSA primarily spread?

- MRSA is primarily spread by direct physical contact with a person or object that is carrying the bacteria, such as shared equipment.
- In the hospital setting, the most common vector of transmission is health care workers' hands.

The “MRSA Bundle”

- **Active Surveillance**
- **Hand Hygiene**
- **Contact Precautions**
- **Cultural Change**

What you
can't see
CAN hurt
you

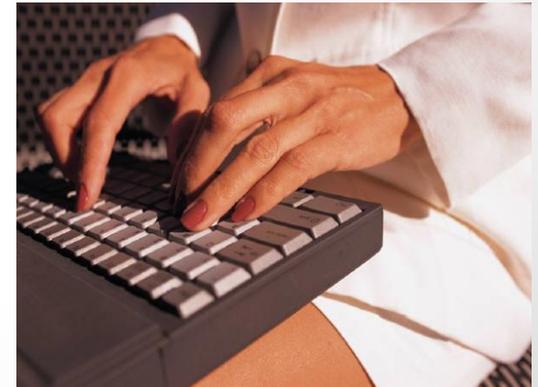


Multi-Drug Resistant Organisms

- Bacteria or other microorganisms that have developed resistance to antimicrobial drugs. Common examples include:
 - MRSA (methicillin resistant staphylococcus aureus)
 - VRE (vancomycin resistant enterococcus)
 - *Candida auris* (fungal)
 - *Clostridium difficile* NAP-1 strain
 - CRE (carbapenem resistant enterococcus)
 - ESBL (Extended spectrum beta lactamase resistant)
 - Resistant *Acinetobacter*
 - Common infection caused by MDROs:
 - Urinary tract infections, pneumonia, blood infections, wound infections, surgical site infections, ventilator associated events

What about our environment?

MRSA can survive more than 38 weeks on environmental surfaces such as door knobs, faucets, keyboards, telephones, even sterile goods packaging.



Cultural Change

Infection prevention is your job.

Nursing assistant, nurse, doctor, respiratory therapist, phlebotomist, staff person on the unit, trainee, a volunteer delivering papers, a social worker conducting a consultation...*no matter what your function is at the VA – you have a responsibility to our patients to prevent the spread of infections!*

Transmission Based Precautions

(sometimes referred to as Isolation Precautions)

CONTACT PRECAUTIONS

ATTENTION VISITORS & STAFF:



This patient requires:

CONTACT PRECAUTIONS

Anyone entering this room must wear the following to prevent the spread of infection:



Gloves



Gown



Wash Hands with Soap & Water or Alcohol Foam

Other Precautions

- Dedicated Equipment
- Private Room or Cohort Patients

- Private room, if unavailable, cohort with patient(s) who have active infection with the same microorganism but no other infection(s).
- Dedicated BP cuffs & stethoscopes. Any other multi-use equipment must be disinfected before leaving room and used on other patients.
- Gloves are required when entering room if contact with patient. Change gloves immediately after contact with infective material. Remove gloves and wash immediately before leaving room. **GLOVES NEVER TAKE THE PLACE OF HAND HYGIENE.**
- Wear a gown every time you have contact with the patient or the patient's care area. Remove gown before leaving room. **GOWNS ARE NOT REUSEABLE.**
- Perform hand hygiene before donning gloves and after glove removal.

Used for MDROs

CONTACT PRECAUTIONS

- Use Contact Precautions :
 1. Specified patients known or suspected to be infected or colonized with epidemiologically important microorganisms that can be transmitted by
 - Direct Contact with the patient (hand or skin-to-skin contact that occurs when performing patient care activities that require touching the patient's skin)

CONTACT PRECAUTIONS

CONTINUED

Use Contact Precautions :

- Specified patients known or suspected to be infected or colonized with epidemiologically important microorganisms that can be transmitted by Direct Contact with the patient (hand or skin-to-skin contact that occurs when performing patient care activities that require touching the patient's skin)

CONTACT PRECAUTIONS

CONTINUED

- Indirect Contact (touching) with environmental surfaces or patient care items in the patient's environment.
- Contact Precautions are used for organisms which are easily transmitted in the caregiving environment:
 - VRE /Clostridium difficile/CRE
 - Other multi-drug resistant organisms

CONTACT PRECAUTIONS

CONTINUED

- **Hand hygiene upon entry and exit to the room.**
- Gloves and gowns are required when having direct contact with patient and/or any equipment or furnishings in the room.



AIRBORNE PRECAUTIONS

PRIVATE AIRBORNE ISOLATION ROOM

DOOR must be CLOSED except for necessary traffic. Monitored negative air pressure 6-12 air changes per hour discharge of air outdoors or HEPA filtration prior to recirculation.

All persons must wear a CAPR when entering the room of known or suspected Airborne disease. i.e. TB /disseminated Herpes Zoster or communicable diseases such as known or suspected measles (rubeola) or varicella (chicken pox).

Limit patient travel to essential purposes; place surgical mask on patient if leaves room.

Instruct patient in proper use and disposal of tissues.

ATTENTION VISITORS & STAFF:



This patient requires:
AIRBORNE PRECAUTIONS

Anyone entering this room must wear the following to prevent the spread of infection:



Gloves



Gown



Wash Hands with Soap & Water or Alcohol Foam



PAPR Required When Entering Room



Transport

- Limit Transport of Patients
- Place Surgical Mask on Patient
- Notify Receiving Department of



Other Precautions

- Dedicated Equipment
- Private Room with Monitored Negative Air Pressure

AIRBORNE PRECAUTIONS

CONTINUED

Airborne precautions are to be applied to patients known or suspected to be infected with microorganisms transmitted in the air by airborne droplet nuclei (small particle residue [5 μ m or smaller in size] of evaporated droplets containing microorganisms that remain suspended in the air and that can be dispersed widely by air currents within a room or over a long distance).

- **Tuberculosis – confirmed or suspected cases**
- **Varicella [*chickenpox or Disseminated Zoster*]**
- **Rubeola [*Hard or Red Measles*]**

Hand hygiene must be performed after removal of Personal Protective Equipment.

DROPLET PRECAUTIONS

ATTENTION VISITORS & STAFF:



This patient requires:

DROPLET PRECAUTIONS

Anyone entering this room must wear the following to prevent the spread of infection:



Gloves



Gown



Wash Hands with Soap & Water or Alcohol Foam



Isolation Mask Required when Entering Room

Transport

- Limit Transport of Patients
- Place Surgical Mask on Patient



Other Precautions

- Dedicated Equipment
- Private Room or Cohort Patients

Perform Hand Hygiene before donning gloves and after glove removal.

Surgical masks are upon entry into the patient's room.

Instruct patient to practice Respiratory Etiquette by covering mouth with a tissue when coughing, dispose of tissue in receptacle and wash hands.

– When private room is not available, cohort with patient(s) who have active infection with the same microorganism but no other infection.

– Limit travel to essential purposes; Minimize transmission of illness by placing a surgical mask on the patient before leaving room.

Assist the patient to perform hand hygiene before leaving their room too.

DROPLET PRECAUTIONS

- Use Droplet precautions for a patient known or suspected to be infected with microorganisms transmitted by droplets (large particle droplets [larger than 5 μ m in size] that can be generated by the patient during coughing, sneezing, talking or the performance of procedures involving the airway.
 - **Diphtheria**
 - **Neisseria meningitis**
 - **Pertussis**
 - **All rule out meningitis**

CONTACT II PRECAUTIONS

ATTENTION VISITORS & STAFF:



This patient requires:

CONTACT PRECAUTIONS II

Anyone entering this room must wear the following to prevent the spread of infection:



Gloves



Gown



Wash Hands with Soap & Water Only
DO NOT USE ALCOHOL FOAM



- Always Cover Patient with Clean Linens Before Transporting to Other Departments
- Notify Receiving Department of Necessary Precautions



- Dedicated Equipment
- Private Room or Cohort Patients

- Perform Hand Hygiene prior to donning gloves and after glove removal.
- DO NOT USE ALCOHOL HAND GEL PRODUCT after removing gloves.
- Use Soap and Water inside the room. Do not touch anything on way out of room.
- Gowns and gloves are necessary when entering the patient room and during contact with the patient and their environment.
- Visitors, check at the Nursing Station prior to entering the room.
- Patients need to be placed in private room.
- Ensure patient's gown / pajama are clean before leaving the room. Assist the patient to perform hand hygiene.
- Notify receiving department of precautions.

CONTACT II PRECAUTIONS

CONTINUED

- Patients placed in Contact II Precautions are being ruled out for infectious communicable diarrheal illness.
- Diseases that are in this isolation are C. difficile, Salmonella, Shigella or gastrointestinal disease i.e. Norovirus and Hepatitis A.
- Hand hygiene with alcohol products is allowed on entry only.
- Handwashing at the sink is required before exiting the patient's room.



Bloodborne Pathogen Standard

29 CFR 1910.1030

Purpose of the Standard:

- ❖ To protect workers who are or may be exposed to blood or other potentially infectious materials (OPIM) as a result of doing their job duties

Who is covered by the Standard?

- ❖ All employees who could “reasonably anticipate” coming in contact with blood or OPIM as a result of performance of their duties on the job

BLOOD

AND OTHER POTENTIALLY INFECTIOUS MATERIALS

“Blood” means:

- Human blood, human blood components, and products made from human blood

“Other Potentially Infectious Materials” or “OPIM” means:

- Human body fluids (cerebrospinal, peritoneal, synovial, pleural, pericardial, amniotic fluid, semen, vaginal secretions)
- Other body fluid *visibly contaminated* with blood e.g. saliva, vomit, urine, stool
- All body fluids where it is difficult to differentiate between body fluids (for example, emergency response situations)

THE MAJOR BLOODBORNE PATHOGENS

HIV	HBV	HCV
<p>Blood, body fluids, breast milk</p> <p>Route of Transmission Transfer or direct contact with infected body fluids, broken skin, mucous membrane, sexual contact</p> <p>Attacks immune system causing it to break down. Makes more susceptible to other diseases/viruses</p> <p>HIV has a low survival rate outside of the body</p> <p>Detection can be delayed due to HIV's ability to integrate into the host DNA and remain inactive. Can lead to AIDS</p> <p><u>Vaccine:</u> No</p> <p><u>CDC Report 2017:</u> ~ 1.1 million in US living with HIV 1 in 6 (19.8%) unaware of their infection 30,000 new infections per year</p> <p>Conversion rate after percutaneous exposure from HIV + patient - 0.3%</p>	<p>Blood/Body fluids</p> <p>Route of Transmission Broken skin, mucous membrane, Sexual contact</p> <p>Viral infection that affects liver. Acute infection can range from mild illness to serious illness requiring hospitalization.</p> <p>Chronic infection can occur - means it remains in the persons body and can lead to serious health problems.</p> <p><u>S&S:</u> Acute: usually within 3 to 6 months of exposure: Fever, fatigue, loss of appetite, nausea, vomiting, abdominal pain, dark urine, joint pain, jaundice and grey-colored stools</p> <p><u>Vaccine:</u> yes: series of 3 shots (available free through occupational health)</p> <p><u>CDC Report:</u> 1.1 million in US have chronic HBV Many not aware New cases have ↓ 80% over last 20 years 40,000 per year become infected In US most common route of exposure is through sexual contact</p> <p>Conversion rate after percutaneous exposure from HBV+ patient - 6% to 30%</p>	<p>Blood/Body fluids</p> <p>Route of Transmission Broken skin, mucous membrane Sexual contact (rare)</p> <p>Viral infection that affects liver. Acute (new) infection is often "silent" and most commonly progresses to chronic infection.</p> <p>Chronic infection occurs in 75% to 80% of those infected with HCV.</p> <p><u>S&S:</u> Acute (rare): usually seen within 6 months of exposure: jaundice, nausea, vomiting, abdominal pain, dark urine, joint pain, loss of appetite, fever, fatigue</p> <p>Chronic: most don't have any symptoms. At risk for liver cancer, cirrhosis or liver failure. Leading cause of liver transplants in US.</p> <p><u>Vaccine:</u> No</p> <p><u>CDC Report:</u> 3.2 million in US with chronic HCV 17,000 new cases per year, many unaware they are infected</p> <p>Conversion rate after percutaneous exposure from HCV+ patient - 1.8%</p>

POTENTIAL MODES OF TRANSMISSION

OF BLOODBORNE PATHOGENS

Potential Modes of Transmission of Bloodborne Pathogens

Sharps Exposures:
needlesticks, cuts with
sharp instruments,
broken glass



Spills and Splashes:
blood and OPIM contact
with mucous membranes,
non-intact skin



MOST AT RISK:

- Direct Care Givers such as Providers and Nursing Staff
- Laboratory Personnel
- Law Enforcement
- Facilities, Engineering, Shop Staff
- Environmental Services Staff (housekeeping, laundry)
- Students and Volunteers
- Researchers

Approximately 5.6 million workers in health care and other facilities are at risk of exposure to bloodborne pathogens



Nationally, workers in the healthcare industry experience about 600,000 needle sticks and other injuries from sharp objects each year.

Four Methods of Compliance with the OSHA Bloodborne Pathogens Standard

1. Always Follow *Standard Precautions*: treat all human blood and OPIM as if it were known to be infectious for HIV, HBV, HCV and other bloodborne pathogens



Are
**Standard
Precautions**
Enough?

→ **NO!**

2. Identify and Use **Engineering Controls**: Devices that isolate or remove the bloodborne pathogen hazard from the workplace.

Examples:

❖ sharps disposal containers



❖ self sheathing needles



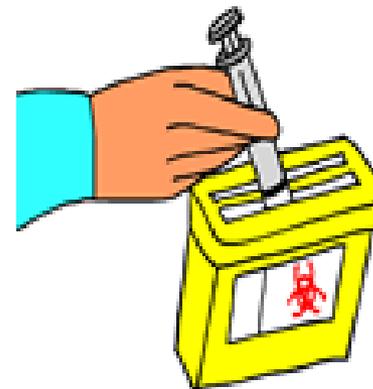
❖ needleless systems

❖ engineered sharps-injury systems designed to protect employees

3. Identify and Ensure the Use of *Work Practice Controls*: Controls that reduce employee exposure by changing the way a task is performed

Examples:

- Policies/procedures for safe labeling, handling, storing, transporting and disposing of regulated waste, such as contaminated sharps, specimens, soiled linens
- Housekeeping: maintain worksite in a clean and sanitary condition and decontaminate surfaces and equipment after contact with blood and OPIM
- Hand Hygiene: provide accessible hand hygiene facilities to staff, and ensure their appropriate use



Standard Precautions

- Choose PPE based on:
 - Procedure you are performing
 - Mode of transmission of potential pathogens
 - Remember, **EVERY PATIENT IS ON STANDARD PRECAUTIONS!**



4. Ensure Use of Appropriate *Personal Protective Equipment*:

- Provided at no cost to staff in the appropriate size and in an accessible location
- Includes, but is not limited to, gowns, gloves, lab coats, masks, face shields, goggles, shoe coverings, eye protection
- Is maintained, repaired, replaced, laundered, and disposed of properly by the PVAHCS
- Does not allow blood or OPIM to pass through or to reach the employee's clothes, skin, eyes, mouth or other mucous membranes under normal use.





What is an Exposure Incident?

“A specific eye, mouth, other mucous membrane, non-intact skin, or percutaneous (puncture through the skin) contact with blood or OPIM that results from performance of an employee’s duties”

If you are involved in exposure incident, immediately care for yourself, then notify your supervisor or instructor. It is important to get the name of the patient involved in your exposure too.

What to Do if an Exposure Occurs?

- ❖ Wash exposed area with soap and water, or
- ❖ Flush splashes to nose, mouth, or skin with water, or
- ❖ Irrigate eyes with water or saline
- ❖ Report the exposure incident to supervisor immediately
- ❖ Call Occupational Health to set up a time to be seen/evaluated. Extension: 7317
- ❖ If after hours, or for an injury that is perceived to be more serious (e.g. deep laceration), proceed to the Emergency Department

A confidential medical evaluation and follow up should be made immediately available to any exposed employee

Post-Exposure Evaluation and Follow-Up

Employee must:

- ❖ Report exposure to supervisor, initiate electronic CA-1
- ❖ Report to Occupational Health. Call: x7317 (or if after hours the ED)
- ❖ Keep appointments for follow-up

Employer must:

- ❖ Immediately direct the worker to a healthcare professional: Occupational Health or ED
- ❖ Document routes of exposure and how exposure occurred
- ❖ Record sharps injuries and type of sharps involved in the sharps injury log (includes device type, brand, description and location of incident)

Health Provider must, immediately or as soon as feasible.:

- ❖ Order testing (HBV Ab, HBV Ag, HCV Ab & HIV). Obtain consents if needed.
- ❖ Provide prophylaxis as appropriate
- ❖ Provide written opinion of findings to employer and copy to employee within 15 days of the evaluation
- ❖ Employee shall be advised of regulations concerning disclosure of the identity and infectious status of the source individual
- ❖ Provide risk counseling and offer post-exposure protective treatment for disease when medically indicated in accordance with current U.S. Public Health Service guidelines

Standard Precautions includes Safe Injection Practices too!

Prevent Infections in Your Patients
Injection Safety is Every Provider's Responsibility

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**ONE NEEDLE,
ONE SYRINGE,
ONLY ONE TIME.**



Safe Injection Practices Coalition

www.ONEandONLYcampaign.org

The *One & Only Campaign* is a public health effort to eliminate unsafe medical injections. To learn more about safe injection practices, please visit OneandOnlyCampaign.org.



For the latest news and updates, follow us on
Twitter [@injectionsafety](https://twitter.com/injectionsafety) and
Facebook [OneandOnlyCampaign](https://facebook.com/OneandOnlyCampaign).

Standard Precautions and Principles for Cleaning/Disinfecting

Spaulding Classification

Patient Contact	Examples	Device Classification	Minimum Inactivation Level
Intact skin		Non-Critical	Cleaning and/or Low/Intermediate Level Disinfection
Mucous membranes or non-intact skin		Semi-Critical	High Level Disinfection
Sterile areas of the body, including blood contact		Critical	Sterilization

- **Cleaning:** The physical removal of foreign material (e.g., dust, soil) and organic material (e.g., blood, secretions, excretions, microorganisms). Cleaning physically removes rather than kills microorganisms. It is accomplished with water, detergents and mechanical action.
- **Disinfection:** The inactivation of disease-producing microorganisms. Disinfection does not destroy bacterial spores. Medical equipment/devices must be cleaned thoroughly before effective disinfection can take place
- **High-Level Disinfection (HLD):** The level of disinfection required when processing semicritical medical equipment/devices. High-level disinfection processes destroy vegetative bacteria, mycobacteria, fungi and enveloped (lipid) and non-enveloped (non-lipid) viruses, but not necessarily bacterial spores. Medical equipment/devices must be thoroughly cleaned prior to high-level disinfection
- **Sterilization:** The level of reprocessing required when processing critical medical equipment/devices. Sterilization results in the destruction of all forms of microbial life including bacteria, viruses, spores and fungi. Equipment/devices must be cleaned thoroughly before effective sterilization can take place.

Safe Handling of Equipment

Remember, you are in the patient environment and surfaces may be contaminated with bloodborne pathogens and germs!

Pathogen	Survival Time
MRSA	7 days to > 12 months
VRE	5 days to > 46 months
Pseudomonas aeruginosa	6 hours-16 months
Clostridium difficile	> 5 months
ESBL organisms	2 days-weeks
CRE	19 days
Influenza	Few minutes-24 hours



*Chemaly, Simmons, Dale et al., The role of the healthcare environment in the spread of multidrug-resistant organisms: update on current best practices for containments. Ther Adv Infect Dis. 2042(3-4): 79-80.
adapted Table 1.

Disinfectant Wipes

Patient care equipment must be cleaned and disinfected between patients.

Clean at point of use, before leaving the patient's room or procedure area.



SUPER SANI-CLOTH®
55% Alcohol w/ Quat



SANI-CLOTH® AF3
Alcohol Free Quat
Fragrance Free



SANI-CLOTH® BLEACH
1:10 Dilution bleach
Kills C. Diff spores



Contact vs. Dry Time



What is contact time?

- The time required for a surface to remain “wet” with disinfectant to KILL germs
- **Purple Top = 2 minutes**
- **Gray Top = 3 minutes**
- **Orange Top = 4 minutes**
- Easy Screen = None, but you need to clean all surface area

What is dry time?

- Until surface is visibly dry



Handwashing

- Washing
 - 15 -20 seconds
 - Areas to concentrate on
 - No special soaps are needed
 - No artificial nails, overlays, nail art or jewelry
- Rinsing
 - Soap residues cause chapping
 - Breaks in skin are entries for germs



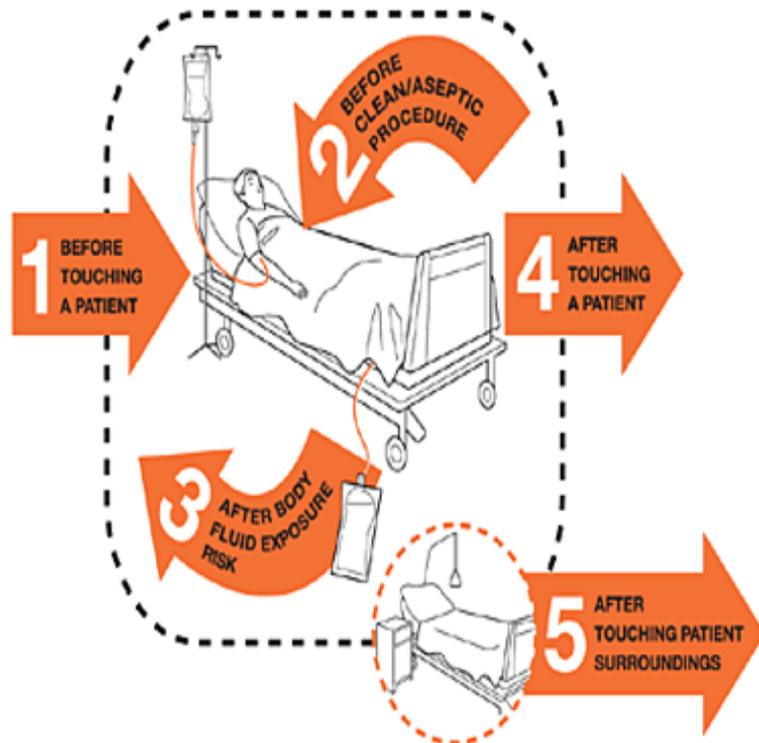
Handwashing

- Drying
 - Evaporation will dry outer skin layer and cause breaks
- Apply hospital supplied lotion at strategic times
 - Keep skin supple in areas that move

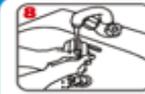
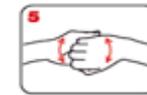


Hand Hygiene – 5 Moments for Hand Hygiene

World Health Organization 5 Moments for Hand Hygiene



How to handrub? WITH ALCOHOL-BASED FORMULATION



20-30 sec

40-60 sec



WHO acknowledges the Hôpital Universitaire de Genève (HUG), in particular the members of the Infection Control Programme, for their active participation in developing this material.



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