Isolation Guidelines and Bloodborne Pathogen Exposures: HIV Post Exposure Prophylaxis with Rapid HIV Testing of Source; Mucous Membrane Exposures

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Outline

- Isolation categories
- Bloodborne pathogens lists
- Exposure types
- Risk of transmission based on exposure
- VCUHS data of occupational bloodborne pathogen exposures
- PPE: for mucous membrane exposures
- PEP and Rapid HIV Testing- new protocol
Goal of Isolation

• Prevent transmission of microorganisms from infected or colonized patients to other patients, hospital visitors, and healthcare workers
Types of Isolation Precautions

Transmission-based Precautions
- for patients with documented or suspected infections
  - 3 Types:
    - airborne, droplet and contact

Standard Precautions
- Apply to all Patients
  -- Replace Universal Precautions
Standard Precautions

- Used for *all* patients
- Must wear gloves when touching:
  - Blood
  - All body fluids
  - Nonintact skin
  - Mucous membranes
- Wash hands immediately after glove removal and between patients
Standard Precautions

• **Masks, eye protection, face shield:**
  – Wear during activities likely to generate splashes or sprays

• **Gowns**
  – Protect skin and soiling of clothing
  – Wear during activities likely to generate splashes or sprays

• **Sharps**
  – Avoid recapping of needles
  – Avoid removing needles from syringes by hand
  – Place used sharps in puncture-resistant containers
Airborne Precautions

• Designed to prevent airborne transmission of droplet nuclei or dust particles containing infectious agents

• For patient with documented or suspected:
  – Measles
  – Tuberculosis (primary or laryngeal)
  – Varicella (airborne + contact)
  – Zoster (disseminated or immunocompromised patient; (airborne and contact)
  – SARS (Contact+airborne)
Airborne Precautions

• Room:
  – Negative pressure
  – Private
  – Door kept closed

• Mask
  – Orange ‘duckbill’ mask required to enter room
Empiric Use of Airborne Isolation

- Vesicular rash (*airborne*+*contact*)
- Maculopapular rash with coryza and fever
- Cough + fever + upper lobe pulmonary infiltrate
- Cough + fever + any infiltrate + HIV infection
Droplet Precautions

• Designed to prevent droplet (larger particle) transmission of infectious agents when the patient talks, coughs, or sneezes

• For documented or suspected:
  – Adenovirus (*droplet+contact*)
  – Group A strep pharyngitis, pneumonia, scarlet fever (in infants, young children)
  – H. *Influenza* meningitis, epiglottitis
  – Infleunza, Mumps, Rubella
  – Meningococcal infections
Empiric Use of Droplet Precautions

- Meningitis
- Petechial/ecchymotic rash and fever
- Paroxysmal or severe persistent cough during periods of pertussis activity
Contact Precautions

• Used to prevent transmission of epidemiologically important organisms from an infected or colonized patient through direct (touching patient) or indirect (touching surfaces or objects in the patient’s environment) contact
Contact Precautions

• For suspected or documented:
  – Adenovirus (*contact+droplet*)
  – Infectious diarrhea in diapered/incontinent patients
  – Group A strep wound infections
  – MDR bacteria (MRSA, VRE)
  – Viral conjunctivitis
  – Lice, scabies
  – RSV infection
  – Varicella (*Contact+airborne*)
  – Zoster (disseminated or immunocompromised; *contact+airborne*)
  – SARS (*Contact+airborne*)
Blood and Body Fluid Exposures
Potential Bloodborne Pathogens

- Human Immunodeficiency Virus (HIV)
- Hepatitis Viruses
- As well as agents that cause...
  - Babesiosis
  - Brucellosis
  - Leptospirosis
  - Creutzfeldt-Jakob Disease
  - HTLV-1 Infections
  - Arboviral Infections
  - Malaria
  - Relapsing Fever
  - Viral Hemorrhagic Fever
  - Syphilis
Transmission of these agents in the workplace can occur through the following routes:

• **Parenteral exposure** - The pathogen is introduced directly into the body through a break in the skin, needlestick, or through a cut with a contaminated instrument or glass.

• **Mucous membrane exposure** - Exposure through contact of a mucous membrane in the eye, nose or mouth.
Risk of Infection after Contact with Infected Blood

Percutaneous exposure:

Prospective studies of several thousand HCWs indicate that the risk of seroconversion:

HIV-infected blood is approximately 0.3%.

Hepatitis B depends on the e antigen (e Ag) status of the patient.
If the patient's blood is positive for the e Ag
the risk of transmission -30% or about *100 times* that of HIV.

HCV infection is 3% to 10% or about *10 times* the risk following a single exposure to HIV-infected blood.
Risk of Infection after Contact with Infected Blood

• Mucous Membrane Exposure:
  – Risk of HIV Transmission
    • 0.09 % risk of transmission after a mucous membrane exposure to HIV infected blood.
  – Hepatitis B and C
    • Risk of transmission not well documented
    • Presumed to be less than in percutaneous injury
  – Although the risk of transmission associated with mucous membrane exposures is less, it is not negligible
<table>
<thead>
<tr>
<th>Exposure Type</th>
<th>Count</th>
<th>% total</th>
</tr>
</thead>
<tbody>
<tr>
<td>BBF-Mucous Membrane (Splash)</td>
<td>103</td>
<td>29%</td>
</tr>
<tr>
<td>BBF-Needlestick/Sharp</td>
<td>255</td>
<td>71%</td>
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<tr>
<td></td>
<td>358</td>
<td>100%</td>
</tr>
</tbody>
</table>

Roughly 1/3 of all employee bloodborne pathogen exposures at VCUHS are Mucous Membrane
Mucous Membrane Exposures Can be Prevented!!!!!!!

- PPE: Masks, faceshields / goggles
  - MUST BE WORN IN ANY PROCEDURE OR PATIENT CARE ACTIVITY THAT POSES A RISK OF BLOOD OR BODY FLUID SPLASH/SPLATTER/AEROSOLIZATION.
  - The include:
    - Phlebotomy and blood cultures
    - Suctioning of gastric or respiratory secretions
    - Removal of medical devices
      - CVC, ET tubes, Foley catheters, IV lines
Personal Protective Equipment

PPE includes masks, masks with faceshields and goggles.

PPE equipment can be found in isolation carts, and wall mounted PPE storage units.
**Reveal:** Rapid HIV Test
MedMira Laboratories

- Rapid HIV test performed on patient serum
  - HIV antibody test
    - SENSITIVITY: 99.8%
      - All positive tests are confirmed by western blot
    - Processing time for the test (upon receipt by the laboratory) is about 20-30 minutes.
  - It is critical that the source blood be drawn immediately and delivered to the laboratory in an expeditious manner
**Did a percutaneous or MM exposure occur that carries significant risk of transmission of HIV?**

- **Yes**
  - **Have fewer than 36 hours elapsed since the exposure occurred?**
    - **Yes:** Proceed with Rapid HIV Testing
    - **No:**
      - **PEP not indicated; no follow-up needed**

- **No:**
  - **PEP not optimal but should be considered. If considered - proceed with rapid HIV testing of source and follow algorithm accordingly.**

**Sample must be obtained STAT (serum separator) and sent via pneumatic tube to Immunology Lab.**

**PEP Team Member will be notified of both POSITIVE and NEGATIVE results by the lab.**

**Initiate HAART (IF SOURCE IS POSITIVE - 3 DRUGS ARE PREFERRED) THESE ARE STANDING ORDERS:**
- Recommended regimen: zidovudine 300 mg po bid + lamivudine 150 mg po bid (or Combivir 1 bid)
- **PLUS**
  - Nelfinavir 1250 mg po bid with food
  - Perform baseline confidential HIV testing of the exposed healthcare worker within 72 hours of initiating HAART
  - Refer to Employee health for additional management: HAART, Hepatitis B and C

**Source patient’s serologic test is confirmed HIV negative and there is no evidence of acute retroviral syndrome in the source patient.**

- **Stop PEP**

**Source patient’s serologic test is confirmed HIV positive or indeterminate, or serology is unable to be obtained.**

- **Continue PEP for 4 weeks**
Conclusion-1

• Mucous membrane blood and body fluid exposures are known risk factors for the transmission of HIV and Hepatitis B/C

• Of all blood and body fluid exposures at VCUHS; mucous membrane exposure account for 30% nearly every year.

• PPE (masks, faceshields or goggles) must be worn when a patient care activity poses a risk of BBF splash, spray or aerosolization.
Conclusion-2

• New PEP protocol
  – Rapid HIV testing will now be employed
    • Processing time is about 20-30 minutes upon receipt of the source patient’s blood
    • Blood must be obtained from the source in an expeditious manner
    • Rapid HIV test results will be reported back to the PEP member
  – Standing orders for Antiretrovirals; 3 regimen HAART