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## **Infection Control HIV/AIDS and Other Blood Borne Pathogens**

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## Why we are all here



Race participant. Personal photo by author. 2008



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## Objectives

- Define difference between bloodborne pathogens and infection control
- Precautions / controls
- Personal protective equipment
- Infection control for immunocompromised individuals
- Prevention measures for immunocompromised individuals.



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## Infection Control

- **Program of disease surveillance...**  
in healthcare facilities
    - designed to:
      - Investigate
      - Prevent
      - Control
- the spread of infections and their causative microorganisms



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## Bloodborne Pathogens

Occupational Safety & Health Administration (OSHA)

- ***Bloodborne Pathogens*** are pathogenic microorganisms present in human blood and can cause disease in humans.
- **Include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV).**

US Dept of Labor, OSHA, Regulation 1910.1030(b),  
[http://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=standards&p\\_id=10051](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=10051), accessed 5.7.10



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## ***Other Potentially Infectious Materials***

- **Human body fluids**: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures
- **Any unfixed tissue or organ** (other than intact skin) from a human (living or dead)
- **HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV.**

US Dept of Labor, OSHA, Regulation 1910.1030(b),  
[http://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=standards&p\\_id=10051](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=10051), accessed 5.7.10



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## **Controls**

- **Engineering Controls:**
  - Blood collection devices
  - Sharps disposal containers
  - Needleless systems
- **Work Practice Controls**
  - Reduce the risk of exposure by the way the task is performed (Needle re-capping, hand washing)



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## The Unknown Nurse



Mom, Halloween. Personal photo by author.



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## Control with Failures

- **Appropriate and effective devices for application?**
- **Lack of training**
- **Improper usage**
- **Unforeseen circumstance**
- **Outdated equipment**
- **Inadequate cleaning or decontamination**



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## Personal Protective Equipment

- **Gloves (hypoallergenic)**
- **Mouth pieces**
- **Resuscitation bags**
- **Gowns**
- **Laboratory coats**
- **Face shields**
- **Masks**
- **Eye protection**
- **Pocket masks**



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## Application

- **Universal precautions can be an approach to infection control.**
  - All human blood and some body fluids if they are known to contain
    - HIV
    - Hepatitis B
    - Hepatitis C
    - Other bloodborne pathogens



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## Prevention

- **Hepatitis B Vaccine**
  - Hepatitis B antibody screen 6 months after series for immunity
  - Not everyone develops immunity with immunizations
- **Do not share razors**
- **Be informed about tattooing**



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## A closer look at a razor



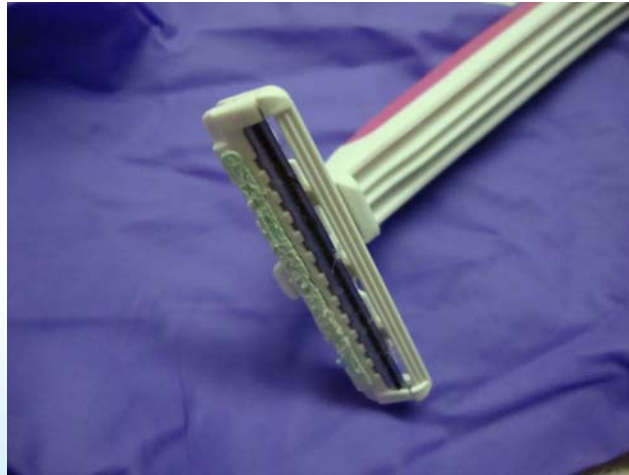
Razor. Personal photo by author.



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## To be fair

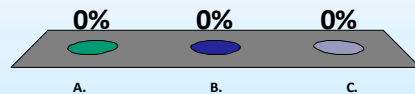


Razor. Personal photo by author.

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## Infection Control:

- A. Is applicable only for healthcare providers**
- B. Is applicable for home and work**
- C. Is not now, but should be a way of life**



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## Infection Control

### The Immunocompromised Individual

#### Sources of infectious material

#### Environment:

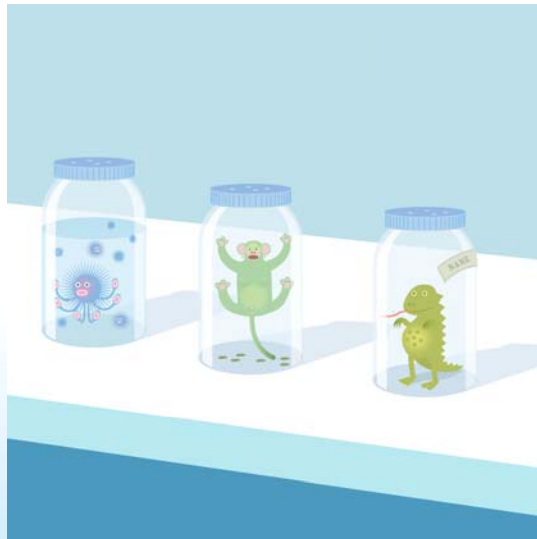
water, air, land ...

#### Food

#### Animals

#### Each other

#### Ourselves



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#### Water

#### General Pollutants

#### Cryptosporidiosis

*Cryptosporidium*

#### Listeria Monocytogens

*Listeria*

#### Legionella pneumophila

*Legionnaires' disease*

(warm water areas)

#### Giardiasis

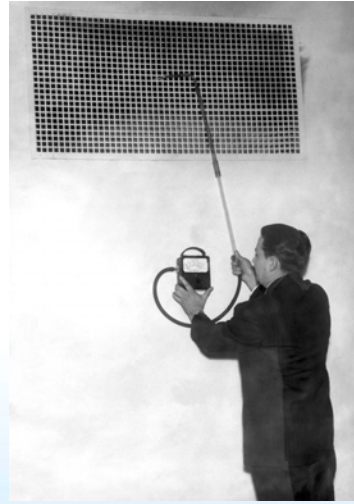
*Giardia*



<http://phil.cdc.gov/phil/details.asp> photo 8218

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**Air**  
**Bacteria (multiple)**  
**Virus**  
**Fungi**  
**Pollen**  
**Dust**  
**Mites and other insects**  
**Animal dander**  
**Mold**



<http://phil.cdc.gov/phil/details.asp> photo ID 9489

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**Land**  
**Cryptosporidiosis**  
**Listeria Monocytogens**  
**Toxoplasmosis**  
**Bartonella Hensale (Cat scratch fever, obtained from cat fleas)**  
**Salmonella**  
**Campylobacter Jenjuni**



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**Food**

- Staphylococcus Aureus
- Non-toxoid Salmonella
- Campylobacter jejuni
- Enterovirus
- Aeromonas Hydrophilla
- Bacillus cereus
- Listeria monocytogenes
- Escherichia Coli
- Vibro Vulnificus
- Clostridium perfringens
- Clostridium Botulinum



<http://phil.cdc.gov/phil/details.asp> Photo ID# 1111

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**Pets**

**CATS and DOGS**

- Cat scratch fever
- Toxoplasmosis
- Cryptosporidiosis
- Salmonellosis
- Campylobacteriosis
- Giardiasis
- Ringworm
- Roundworms
- Hookworms

**FISH**

- Mycobacterium marinum

**BIRDS**

- Chlamydiosis
- Avian Tuberculosis
- Salmonellosis



My Dogs – 2010 winter Olympics . Personal photo by author.

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**Each Other**

- Staphylococcus Aureus**
- Listeria Monocytogens –  
intrauterine**
- Escherichia Coli**
- H1N1**
- Flu**
- Tuberculosis**
- Common Cold**
- HIV**
- Hepatitis A**
- Hepatitis B**
- Hepatitis C**
- HPV**
- HSV**
- Syphilis**
- Other Sexually Acquired  
Diseases**



Rita Race 2008 . Personal photo by author.

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## Sources of Infection

- **Unpasteurized dairy**
- **Raw meat**
- **Fish / seafood**
- **Mexican foods**
- **Chinese food**
- **Cream-filled desserts**
- **Eggs**
- **Hamburger**
- **Raw rice**
- **Oysters**
- **Hot dogs**
- **Deli meats**
- **Home-canned foods**
- **Oil / herbs**
- **Honey / nuts**
- **Reservoirs**
- **Distributors**
- **Contact surfaces**
- **Carpet / floors/ furniture**
- **Hot tubs / whirlpool spas**
- **Water from cruise ships/ hotels**
- **Pet stool**
- **Toothbrushes**
- **Sex (“inter and outer course”)**

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## A Day in the Life



<http://www.flickr.com/>



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## So What Happens?



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## Signs and Symptoms

- **Fever**
- **Abdominal cramping**
- **Nausea / vomiting**
- **Headache**
- **Muscle ache**
- **Altered skin integrity**  
Folliculitis – Boils – Impetigo – Toxic shock syndrome
- **Organ involvement (liver, CSF, immune system)**
  
- **Death**



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## Those at Risk

- **Immunocompromised individuals**
- **Those on chemo therapy**
- **Bone marrow transplant**
- **Immunotherapy**
- **Agents / diseases that inhibit immune system**
- **Children**
- **Pregnant women**
- **Any one who has difficulty fighting infection**



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## What can be done

- Vaccinate when possible
- Keep areas clean – air and water
- Hand hygiene
- Cleanliness with food preparation
- Cook foods well
- Safer sex
- Wear protective equipment



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## Hand washing



<http://phil.cdc.gov/phil/details.asp> photo ID# 8584

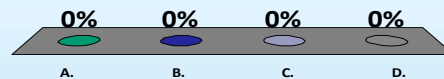


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## The recommended time for Hand Washing with soap is?

- A. 10 seconds
- B. 20 seconds
- C. 30 seconds
- D. The time it takes for the average toilet to flush.



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## How well did we do?

### Hand washing

- Wet hands with water
- Apply enough soap to cover all hand surfaces
- Rub palm to palm
- Rub top of hand with other palm - swap
- Palm to palm fingers interlaced - webs of hand
- Fingers interlocked - nail beds
- Don't forget the thumb
- Clean under nails
- Rinse with water
- Dry with disposable towel
- Use towel to turn of faucet

### Hand Rub with sanitizer

- Apply about 1tsp/ 5cc of product
- Rub hands palm to palm
- Rub top of hands - swap
- Fingers interlaced - web of hands
- Fingers interlocked - nail beds
- Don't forget thumb
- Clean under nails
- Wait for hands to dry

<http://www.cdc.gov/handhygiene/Basics.html>

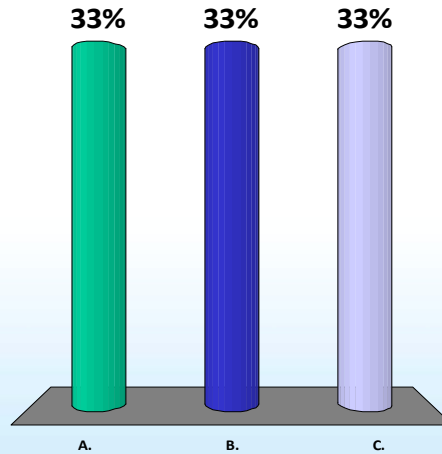


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## Hand Sanitizers

- A. All hand sanitizers are the same
- B. Are better than washing hands
- C. For optimal “germ killing” potential need to be at least 60% ethanol



## How Clean are these?



UF & Shands Peds Hall. Personal photo by author.

## Which is better?

### Hand washing

- **Water, soap and friction**
  - Break up oils that trap germs
- **Wash for 15-20 seconds**
- **Wash nail beds and cuticles**
- **Dry with clean towel**
- **Does not destroy helpful bacteria**

### Hand sanitizer

- **60-95% ethanol/isopropanol**
- **Use 1 teaspoon (5 cc)**
- **Rub hands together until dry**
- **Kills all bacteria, even good ones**



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