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Infection Control

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OBJECTIVES
• What is infection control?
• Why should you care?
• What do you need to do?

‘...conscious management of the clinical environment for purposes of minimizing or eliminating the potential spread of disease’
Bankaitis

What is infection control?
OBJECTIVES

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How immune system works

IMMUNE SYSTEM

Non-Specific Immune Responses

Specific Immune Responses

Physical barriers (skin)
Soluble factors
Cells
ANTIGEN

How immune system works
• Bone Marrow
• Thymus
• Lymph Nodes
• Spleen, tonsils, adenoids, appendix, peyer’s patches

IMMUNE CELL ASSEMBLY

• Network of vessels
• Channels lymph fluid to lymph nodes
• Directs lymph fluid toward chest
• Empties into bloodstream
• Reabsorbed by body tissues
• Redirected to flow through lymphatic system

LYMPHATIC SYSTEM
Execute & manage all activities of the adaptive immune system

B-Cell  T-Cell

Lymphocytes

- Maturation process occurs within bone marrow
- Identify antigen
- Triggered to produce antigen-specific antibody proteins
- Antibody destroys antigen

Humoral Immunity

B-Cell

Antigen

Bodily fluid = HUMOR
Lymphocytes

- Maturation process initiated within bone marrow
- Completed in thymus
- Several categories
- Detects antigen
- Destroys antigen

Image from: http://uhaweb.hartford.edu/BUGL/immune.htm#fluids

Cell-Mediated Immunity

CD4 T-Cell

Antigen

Activation Signal

B-Cell

CD4 T-Cell

Antigen

Antibody

Antibody

Antibody

continued
Lessons Learned from HIV

Concern for cross-contamination
OSHA enacts regulations
Provide guidelines on minimizing exposure
**Standard Precautions**

- Originally set in 1987 by CDC
- List of recommendations intended to reduce cross-infection
- Protect HCW from exposure to blood-borne pathogens
- Expanded to include all potentially infectious microbes

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**Methicillin-resistant Staphylococcus aureus (MRSA)**

- Serves as IC reminder!
- Genetic mutation of staph
- Resistant to certain antibiotics
  - methicillin
  - penicillin
  - amoxicillin
- Not just nosocomial infection
- Transmission via direct or indirect contact
Why Should PTs Care?

- Contact with bodily fluids
- Multiple contact with many patients & many reusable objects

Increases potential for disease transmission!

MULTIPLE CONTACTS:
increased potential for microbial transmission
Why Should PTs Care?

- Contact with bodily fluids
- Multiple contact with many patients & many reusable objects
- Opportunistic infections
  - Hallmark of immunocompromise
  - Originate from common place organisms
  - Take opportunity to infect body with disabled immune system
Opportunistic Infection Analogy

INTACT IMMUNE SYSTEM

Opportunistic Infection Analogy

COMPROMISED IMMUNE SYSTEM

OBJECTIVES

- What is infection control?
- Why should you care?
- What do you need to do?

CREATE WRITTEN PLAN
IS A WRITTEN PLAN NECESSARY?

- OSHA federal regulatory body responsible for overseeing implementation of safety procedures in the workplace
- Guidelines on how to reduce exposure to infectious agents
- Scope of practice dictates OSHA's jurisdiction
- Obligated to uphold federally mandated infection control standards

- Bodily fluids
- Multiple contact
- Opportunistic infections
- FEDERAL MANDATE

WRITTEN INFECTION CONTROL PLAN

REQUIREMENTS
1. Employee Exposure Classification
2. Hepatitis B (HBV) Vaccination Plan
3. Plan for Annual Training & Records
4. Plan for Accidents & Accidental Exposure Follow-up
5. Implementation Protocols
6. Post Exposure Plans & Records

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CLINIC SPECIFIC
WRITTEN INFECTION CONTROL PLAN

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IMPLEMENTATION PROTOCOLS

DEVELOP WORK PRACTICE CONTROLS

• Profession-specific procedures designed to reduce the likelihood of cross-contamination
  • Make a list of services you provide
  • Create written procedure
  • Base procedure on Standard Precautions

Standard Precautions

• Appropriate personal barriers (gloves, masks, eye protection, gowns) must be worn when performing procedures that may expose to infectious agents
• Hands must be washed before and after every patient contact and after glove removal
• "Touch" and "splash" surfaces must be pre-cleaned and disinfected
• Critical instruments must be sterilized
• Infectious waste must be disposed of appropriately
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Hands must be washed......

- PATIENT APPTS
- GLOVE REMOVAL
- AS NEEDED

PERSONAL BARRIERS

- GLOVES
- SAFETY GLASSES
- DISPOSABLE MASKS
- DISPOSABLE GOWNS

OPEN or VISIBLE WOUNDS
DRY NEEDLING
Do you wash your hands...

Amlani, 1999

- 26% YES (after each patient)
- 50% YES (after use of lavatory)
- 82% YES (after each patient)
- 87% YES (after use of lavatory)

Burco, 2008

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TOUCH SURFACE:
area that comes in potential direct or indirect contact with hands

SPLASH SURFACE:
area that may be hit with blood or other body secretions from potentially contaminated source
TERMINOLOGY

CLEAN
- Remove gross contamination
- Germs not necessarily killed
- Important precursor to disinfecting & sterilizing

DISINFECT
- Process whereby germs killed
- Spectrum of kill depends
- Performed on touch & splash surfaces or on individual patient’s items that are not transferable to others

Standard Precautions
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Critical Instruments
- Instruments introduced directly into bloodstream
- Non-invasive instruments that come in contact with mucous membranes or bodily substances
- Instruments that can potentially penetrate skin from use or misuse

continued
TERMINOLOGY

**DISINFECT**
- Process whereby germs killed
- Spectrum of kill depends
- Performed on touch & splash surfaces or on individual patient's items that are not transferable to others

**STERILIZE**
- Process whereby ALL germs killed
- Specific product requirements
- Performed on all reusable critical instruments that have been cleaned prior to reuse

Standard Precautions
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Infectious wastes
- Sharp instruments
- Contaminated waste
Dry Needling

- Appropriate personal barriers (gloves, masks, eye protection, gowns) must be worn when performing procedures that may expose to infectious agents
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Dry Needling Using Disposable Filiform Needles

PERSONAL BARRIERS  HAND HYGIENE  CLEAN & DISINFECT  INFECTIOUS WASTE  CLEAN & STERILIZE

At beginning of procedure:
- Put on an appropriately sized pair of gloves
- Insert needle directly into myofascial trigger point
- Remove gloves & discard in trash
- Immediately commence hand hygiene procedures

To terminate procedure:
- Put on an appropriately sized pair of gloves
- Remove needle & discard in sharps container
- Remove gloves & discard in trash
- Immediately commence hand hygiene procedures
Select Product

PERSONAL BARRIERS
HAND HYGIENE
INFECTION WASTE
CLEAN & STERILIZE
CLEAN & DISINFECT

PERSONAL BARRIERS

• Latex vs non Latex
• Powder vs Powderless
• Size matters!

HAND HYGIENE

• Traditional soap & water
• Addition of no-rinse hand degermers
**Hand Hygiene**
- Liquid
- Medical grade
- Anti-microbial not critical
- No-rinse = alternative

**Disinfectants**
- Spray, totelette, liquid
- Hospital Grade
- Non-alcohol based

**Clean & Sterilize**
- Cold sterilization
- Ingredients
  - Glutaraldehyde solutions (>2%)
  - Hydrogen Peroxide (7.5%)
- Soak Time
  - 10 hour soak
  - 6 hour soak
- Use/Reuse
  - 28 days
  - 21 days
Material Safety Data Sheet (MSDS)

- Document that outlines hazards associated with chemical products
  - Chemical composition
  - Physical & chemical characteristics
  - Acute & chronic health effects
  - Exposure limits
  - Precautionary measures, first aid consideration
- Not necessarily included in packaging
- OSHA requires MSDSs

Sharps container
Biohazard bags
Spill kit

Take home messages
- Infection control is a required element
- Create work practice controls
- Use standard precautions as your guide
- Select product
- Implement
- Rely on resources