2019 UPDATE
INFECTION PREVENTION and CONTROL

ISOLATION PRECAUTIONS & BLOODBORNE PATHOGENS

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States with Mandatory Public Reporting Policies for Healthcare-Associated Infections (HAIs)

2004

2016

States with legislation for HAI reporting

Deadly bacteria on medical scopes trigger infections

Understanding CRE, the ‘nightmare’ superbug that contributed to 2 deaths in L.A.

CDC: 37,000 US infection-related deaths preventable over 5 years

Dangerous infections now spreading outside hospitals

In U.S., hospital-acquired infections run rampant

The infections at York Hospital, explained

A USA TODAY review finds that deadly CRE bacteria are showing up in hospitals and other health care facilities across the country and there is virtually nothing to stop these “superbugs” at this point.
1996 CDC ISOLATION GUIDELINES
STANDARD PRECAUTIONS

Apply to any healthcare encounter:
- blood
- body fluids
- secretions
- excretions (except sweat)
- non-intact skin
- mucous membranes

Reduce risk to patients & HCP of transmissible infectious agents.

The Centers for Disease Control & Prevention says

“the most common mode of transmission of pathogens is via the hands”

HAIs are:

1. 4th leading cause of death in America.
2. Cost the US healthcare system between $30 – 40 billion dollars each year.
3. Every year, an estimated 2,000,000 patients get a hospital-related infection.
4. 50,000 people die from their infection.
5. The HAI problem is closely related to Hand Hygiene.

Welcome to FLU SEASON 2018-19!

FORGOT YOUR FLU VACCINE?
IT'S NOT TOO LATE!

GET YOUR FLU VACCINE TODAY.
#FIGHT FLU

Types of Vaccinations Available

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For more information, visit: www.cdc.gov/flu
A pair of healthcare workers hands …

WARD off infection hand washing

- Wet hands
- Apply soap
- Rub hands together for 15 seconds then rinse with warm water
- Dry hands with disposable towel then use towel to turn off faucet

When to use Hand Hygiene:

As you ENTER a patient’s room

Before direct contact with patients

Before applying gloves then inserting:
  ✓ a central venous catheter
  ✓ urinary catheters
  ✓ peripheral vascular catheters
  ✓ any other invasive devices

When to use Hand Hygiene:

As you EXIT a patient’s room

After:
  • Contact with body fluids, excretions, non-intact skin, wound dressings
  • Contact with inanimate objects in the immediate vicinity of the patient
  • Contact with contaminated body site moving to a clean body site
  • Removing gloves
Alcohol Foam

- Apply to palm of hand
- Use a Golf Ball size amount of alcohol foam (Volume depends on manufacturer)
- Rub hands together covering all surfaces until completely dry

The use of alcohol foam is preferred, but...DO NOT USE

- When hands are visibly soiled with body fluids or are dirty
- When caring for patients with suspected or confirmed Clostridium difficile, and are in “Contact with Handwashing”
- Before eating
- After using the restroom

Take The Time To Wash Your Hands

Seconds Count – Save A Life

Ability of Hand Hygiene Agents to Reduce Bacteria on Hands


Effect of Alcohol-Based Handrubs on Skin Condition

- Alcohol-based handrub is less damaging to the skin

Personal protective equipment
Work practice controls
Engineering controls
Housekeeping controls
PERSONAL PROTECTIVE EQUIPMENT

- gloves
- gowns
- masks
- goggles
- face shields
- shoe covers
- hair covers
- CPR resuscitator masks

Gowns

- Gowns single use only.
- Tie to cover sides & back.
- Dispose in appropriate container.
- To remove, grasp around top and pull off turning inside out as it is removed so your clothing does NOT become contaminated.

Gloves

- Single use only.
- Must fit properly and cover wrist.
- Remove by grasping at wrist and turn inside out.
- Change gloves and wash hands if going from a dirty to a clean activity.
- Discard in regular trash, or in biohazard trash (red bag) if appropriate.
- Wash hands after gloves are removed.

WORK PRACTICE CONTROLS

Handle sharps with care
Practice good hygiene
- avoid splashing potentially infectious fluids
- keep food/beverages away from patient areas
- wash hands frequently
- change white coat or scrubs if soiled

ENGINEERING CONTROLS

...are designed to eliminate hazards at the source.

Sharps Safety

- Use sharps containers.
- Do not overfill containers.
- Do not recap needles.
- Use forceps to remove needle from syringe.
- Do not bend, break, cut or manipulate sharps.
- Never handle broken glass—use forceps, or a dust pan and broom...
HOUSEKEEPING CONTROLS

- Do not overfill trash containers.
- Do not push trash down with hands or feet.
- Hold trash away from body when transporting.
- Discard all infectious waste in biohazard containers.
- Decontaminate work surfaces with an appropriate disinfectant.

Risk of Infection following exposure:

- **HBV (30%)**
  - Percutaneous: 1-43%
  - Mucocutaneous: 1-6%
- **HCV (3%)**
  - Percutaneous: 0.3-1.8%
  - Mucocutaneous: unknown (very small)
- **HIV (0.3%)**
  - Percutaneous: 0.3%
  - Mucocutaneous: < 0.1%

**PEP Recommended**

- **HBV**
  - If source HBsAg+ and HCP HBsAb <10 mIU/mL
  - Use of HBIG and/or HBV vaccine
- **HCV**
  - Follow up HCV testing
  - No current recommendations for prophylaxis with immune globulin or antiviral agents
- **HIV**
  - 4 weeks antiretroviral drug protocol
  - Consider possible HIV resistance of source

**Document the Injury**

- Report immediately for evaluation and testing to:
  - Employee Health or
    - if closed to Emergency Department
- EARLY PEP most effective!
Hepatitis C followup

Test healthcare worker for anti-HCV within 48 hours of exposure:
- Positive
  - Refer HCV RNA test
- Negative
  - Follow-up testing^1

Refer to care for pre-existing chronic infection^1

Test for HCV RNA > 3 weeks after exposure:
- Positive
  - Refer to care^2
- Negative
  - Stop

Recommended laboratory testing:
- Anti-HIV at baseline, 6 weeks, 3 months, and 6 months (for all HIV-exposed HCP)
- CBC, renal & hepatic panels at baseline and 2 weeks to monitor for toxicity

Transmission Based Precautions

- Contact
- Contact with Handwashing Only
- Droplet
- Airborne
- Neutropenic

Droplet Transmission

Droplets are generated by talking, coughing, and sneezing.

Microorganisms in droplets (10um) are propelled a short distance through the air and deposited on conjunctiva, nose, and mouth mucosa.

PEP FOLLOWUP

HCP to report:
- Any PEP medication side effects
- Signs or symptoms of possible acute HIV infection within 12 weeks of exposure

Recommended laboratory testing:
- Anti-HIV at baseline, 6 weeks, 3 months, and 6 months (for all HIV-exposed HCP)
- CBC, renal & hepatic panels at baseline and 2 weeks to monitor for toxicity
Airborne Transmission

- Microbes eg, AFB in small droplet nuclei (<5um) or dust particles.
- Dispersed widely by air currents and remain suspended for prolonged periods of time.
- Requires special PPE respiratory protection.
- Requires special air handling and ventilation: negative pressure room or portable HEPA filter

Reported Tuberculosis (TB) Cases and Rates
United States, 1993–2017

TB Case Rates* United States, 2017

TB Case Rates* by Age Group, United States, 1993–2017

Contact Transmission

**Direct:**
Between body surfaces resulting in transfer of microorganisms

**Indirect:**
Between a susceptible host and a contaminated intermediate object

Colonized or Infected: What is the Difference?

- People who carry bacteria without evidence of infection (fever, increased white blood cell count) are colonized
- If an infection develops, it is usually from bacteria that colonize patients
- Bacteria that colonize patients can be transmitted from one patient to another by the hands of healthcare workers
- Bacteria can be transmitted even if the patient is not infected

The Inanimate Environment Can Facilitate Transmission

* X represents VRE culture positive sites

~ Contaminated surfaces increase cross-transmission –
Recovery of VRE from Hands and Environmental Surfaces

- Up to 41% of healthcare worker’s hands sampled (after patient care and before hand hygiene) were positive for VRE1
- VRE were recovered from a number of environmental surfaces in patient rooms
- VRE survived on a countertop for up to 7 days2

Epidemiology: Host Factors

- Advanced age
  - Incidence higher among females, whites, and persons > 65 years
  - Death more common in persons > 65 years (5x greater risk)

- Underlying illness and medical history
  - 79% of 7411 patients with CDI had a comorbid condition
  - 98% of 585 patients with NAP1 strain had ED visit in previous 12 weeks
  - Tube feeds

- Immunosuppression
  - Inflammatory bowel disease
  - Immune-suppressive treatment
  - Hematological malignancy/stem cell transplant
  - 79% greater risk

- Presumptive CDI
  - Infection in those without identifiable cause or source
  - Stewardship antimicrobial therapy
  - Antimicrobial therapy achieved

- Contact Precautions (CP)
  - Contamination of the environment is highest prior to treatment
  - Presumptive CP, while CDI test results are pending, may be used as a special approach whenever indicated by risk assessment
  - Patients who have been treated may have asymptomatic shedding
  - Prolonging the duration of CP until discharge is a special approach based on evidence of continued shedding of spores after diarrhea resolves (especially up to 4 weeks after treatment ends)

- Antimicrobial Stewardship
  - Exposure to any antimicrobial is the single most important risk factor for C. difficile infection (CDI).
  - Antibiotic exposure has lasting impact on the microbiome.
    - Risk of CDI is elevated (7-10 fold) during and in the 3 months following antimicrobial therapy
    - 85-90% of CDI occurs within 30 days of antimicrobial exposure
  - Target high-risk antibiotics for CDI prevention
    - Fluoroquinolones
    - 3rd/4th generation cephalosporins, carbapenems

Stewardship Approach: Feedback

Non-restrictive feedback resulted in statistically significant reductions in incident CDI.

Reductions in CDI attained through antimicrobial stewardship surpassed those attained through infection control measures.

Tertiary Hospital in Quebec, 2003-2006

Stewardship Approach: Restriction

Restricting the use of ceftriaxone was associated with reduced rates of CDI.