Preventing Employee Infections

Last Updated 2017

Basics of Infection Prevention
Healthcare-Associated Infections Program
Center for Health Care Quality
California Department of Public Health

Objectives

- Review essential activities of Employee Health programs
- Describe communicable disease screening and immunization guidance
- Describe prevention of bloodborne and airborne diseases
- Review priorities in post exposure management

Employee Health and Wellness

- Education of infection prevention would not be complete without recognizing the role of health care providers (HCP)
- HCP may be:
  - Carriers of infections to patients
  - Recipients of infections from patients
- The most crucial aspect is to keep both patients and HCP safe and infection free

Employee Health Activities

Pre-employment

- Communicable disease screening: immunity by titer or vaccine history
- Physical
- Drug screening
- Latex allergy screening
- TB screening
- Respirator fit-testing

Annual

- TB testing
- Vaccines
  - Annual influenza
- Respirator fit testing

Employee Health Activities - 2

- Infectious disease exposure investigations
- Post-exposure management
- Counseling
  - Infectious disease exposure risk
  - Work restrictions
  - Latex allergies
- Wellness promotion
  - Ergonomic worksite evaluation
  - Blood pressure checks
  - Bloodborne pathogen injury prevention

HCW Immunizations

CDC MMWR Immunization of Health-Care Personnel Recommendations of the Advisory Committee on Immunization Practices (ACIP)

CDC MMWR Immunization of Health-Care Personnel Recommendations of the Advisory Committee on Immunization Practices (ACIP)
https://www.cdc.gov/mmwr/pdf/rr/rr6007.pdf

California Department of PublicHealth

Vaccine	HCP Recommendations
Hepatitis B	Give 3-dose series (dose#1 now, #2 in 1 month, #3 approximately 5 months after #2). Give IM. Obtain anti-HBs serologic testing 1-2 months after dose #3.
Influenza	Give 1 dose of annually. Give inactivated injectable vaccine intramuscularly or live attenuated influenza vaccine (LAIV) intranasally.
MMR	For HCP born in 1957 or later without serologic evidence of immunity or prior vaccination, give 2 doses of MMR, 4 weeks apart. For HCP born prior to 1957. See link below. Give SC.
Varicella (Chickenpox)	For HCP with no serologic proof for immunity, prior vaccination, or history of varicella disease, give 2 doses of varicella vaccine 4 weeks apart. Give SC.
Tetanus, diptheria, pertussis	Give a dose of Tdap as soon as feasible to all HCP who have not received Tdap previously and to pregnant HCP with each pregnancy. See link below. Give Td boosters every 10 years thereafter. Give IM
Meningococcal	Give 1 dose to microbiologists routinely exposed to isolates of *N. meningitidis* and boost every 5 years if risk continues. Give MCV4 IM; if necessary to use MPSV4, give SC

Immunization Action Coalition
http://www.immunize.org/catg.d/p2017.pdf

Employee Exposure Investigations

- Exposure may be patient-to-staff or visitor-to-staff
- Investigations are warranted when staff are exposed to infectious diseases
- Evaluate type of exposure and risk of transmission

- Make list who was exposed: staff, first responders, patients, visitors
- Evaluate staff for post-exposure management
  - Prophylaxis
  - Vaccination
  - TB skin testing
- Determine if local public health or State should be notified

Preventing Bloodborne Disease in HCP

- Implement standard precautions – mandatory
- Provide Hepatitis B Virus (HBV) vaccination series to all staff with potential for blood exposure
- Apply hierarchy of prevention methods
  - Engineering controls: needleless devices
  - Work practice controls: no recapping
  - Appropriate cleaning, linen-handling, disposal of sharps

Preventing Bloodborne Disease in HCP -2

- Provide immediate post-exposure prophylaxis (PEP)
- Require bloodborne pathogen (BBP) training annually and as needed
- Update BBP exposure control plan (mandatory)
  - Employees must be given opportunity to contribute to product evaluation for sharps safety annually

Post-Exposure Bloodborne Disease: Risk for Transmission in Health Care Settings

- Hepatitis B Virus (HBV)
  - 1-6 % if e-antigen negative (HBeAg-)
  - 22-30% if e-antigen positive (HBeAg+)
- Hepatitis C Virus (HCV)
  - 1.8%, range 0-7%
- Human Immunodeficiency Virus (HIV)
  - 0.3% (1 in 300 exposures), range 0.2%-0.5%

Post-Exposure Bloodborne Disease: Risk for Transmission in Health Care Settings- 2

- Less common or rare BBP
  - Syphilis
  - Leptospirosis
  - Malaria
  - Prion diseases
  - Viral hemorrhagic diseases

Body Fluid Exposure Risk

Low/No Risk*

- Sweat
- Tears
- Feces
- Saliva
- Urine

*Unless visibly contaminated with blood

Higher Risk Body Fluids

- Blood
- Amniotic fluid
- Peritoneal fluid
- Cerebrospinal fluid
- Pleural fluid
- Pericardial fluid
- Vaginal fluid/semen
- Any body fluid with visible blood (saliva after dental procedure)

Exposure Risk by Injury Type

- Infection risk dependent on type of exposure
- Examples, from highest to lowest risk:
  - Deep puncture from a used hollow bore needle
  - Laceration or wound with a dirty scalpel or instrument
  - Puncture through a bloody glove
  - Blood or body fluid on non-intact skin
  - Non-intact skin or mucous membrane contact with dried blood
  - Splash to mucous membranes

BBP Post-Exposure Management: Assess Infection Risk

- Type of exposure
  - Percutaneous
  - Mucous membrane
  - Non-intact skin
  - Bites resulting in blood exposure
  - Depth, quantity, or duration of exposure
- Body fluid
  - Blood
  - Other bloody fluid
  - Tissue

BBP Post-Exposure Management: Assess Infection Risk - 2

- Assess viral load of source
  - HBsAg
  - HCV antibody
  - HIV antibody
- If source unknown, assess epidemiologic and clinical evidence to determine post-exposure treatment

BBP Post-Exposure Management: Immediate Care

- Clean with soap and water
- Flush mucous membranes with water
- Flush eyes with eye irrigant or clean water
- Avoid bleach and other agents caustic to skin
- No evidence of benefit from application of antiseptics or disinfectants, or squeezing (milking) puncture sites

BBP Post-Exposure Management: Testing

- Immediate testing

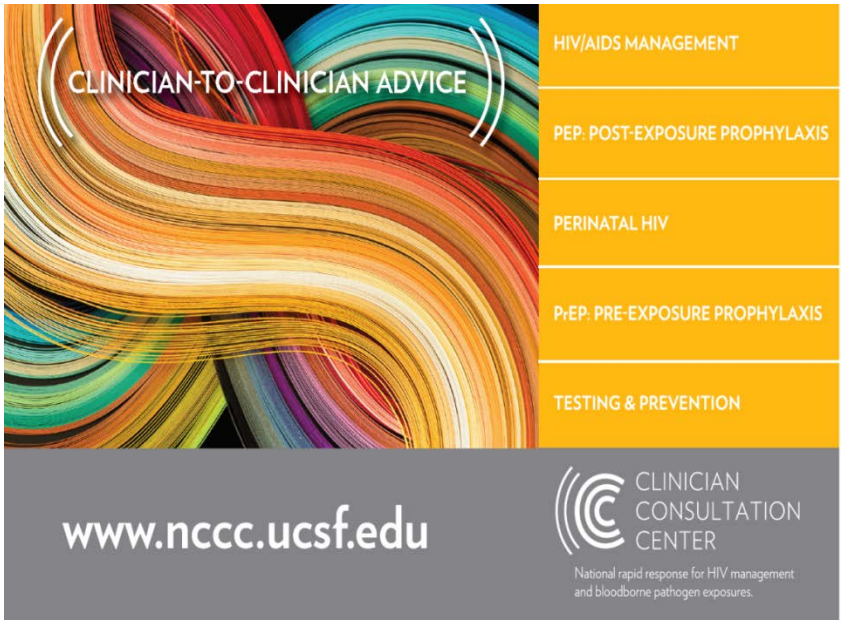
Source (if available)	Employee
Rapid HIV	Rapid HIV
HBsAG	HBsAB (if status unknown)
Hepatitis C Antibody	Hepatitis C Antibody
	Hepatic Function Panel

- Employee follow-up: test for HCV antibody, HIV, and liver function at 6 & 12 weeks and 6 months (4 months with newer PEP therapies)

UCSF Clinical Consultation Center
http://nccc.ucsf.edu/clinician-consultation/pep-post-exposure-prophylaxis/

National Clinician Consultation Center

- Free consultation for clinicians treating occupational exposures to HIV and other bloodborne pathogens
- 9:00 am – 2:00 pm EST
- 7 days a week
- 1-888-448-4911



UCSF Clinical Consultation Center
http://nccc.ucsf.edu/clinician-consultation/pep-post-exposure-prophylaxis/

Post-exposure Prophylaxis for Hepatitis B: Source HBsAg Positive

Vaccination and antibody status of Exposed	Treatment for Employee when Source **HBsAg+**
Unvaccinated	HBIG x1 & initiate Hepatitis B vaccine series
Previously Vaccinated	
Known Responder	No treatment
Known non-responder	HBIG x1 & initiate re-vaccination –or– HBIG x 2
Antibody Response unknown	Test exposed person for anti-HBs 1. If adequate, no treatment 2. If inadequate HBIG x1 & vaccine booster

California Department of PublicHealth

Post-exposure Prophylaxis for Hepatitis B: Source HBsAg Negative or Unknown

Vaccination and antibody status of Exposed Employee	Treatment for Employee when Source **HBsAg- or status unknown**
Unvaccinated	Initiate Hepatitis B vaccine series
Previously Vaccinated	
Known Responder	No treatment
Known non-responder	If known high risk source, treat as if source were HBsAg positive
Antibody Response unknown	Test exposed person for anti-HBs 1. If adequate, no treatment 2. If inadequate, vaccine booster & recheck titer in 1-2 months

Post-exposure Prophylaxis for Hepatitis C

- Prompt wound care or flushing of mucous membranes
- Prophylaxis not recommended
  - Immunoglobulin not effective
  - No data support use of antivirals (e.g., interferon) for preventing infection; may be effective only with established infection
  - Antivirals not FDA approved for this setting
- Consider expert consultation

Post-Exposure Prophylaxis for HIV

- Obtain physician assessment for PEP management soon after exposure, if indicated
  - Treat as an urgent medical concern
  - Ensure CBC, liver panel, pregnancy test done prior to initiation of medication
  - Provide counseling about potential side effects of medications
    - Monitor for potential toxicity

Post-Exposure Prophylaxis for HIV – 2

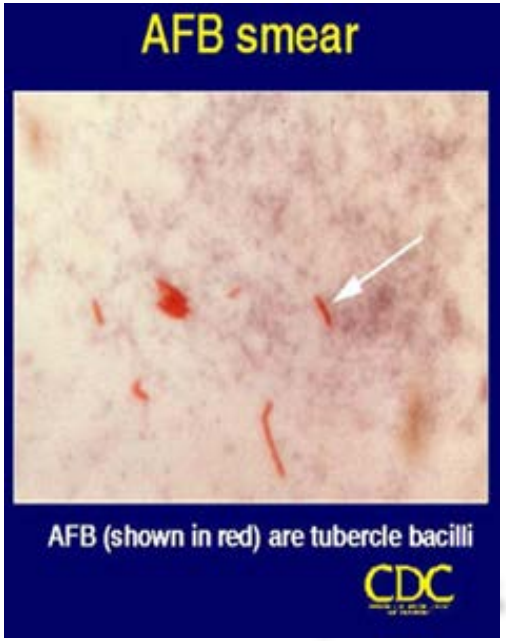
- Interval after which PEP is no longer effective is unknown
- Initiating PEP days or weeks after exposure might be considered for higher risk exposure

Preventing Airborne Disease Transmission in HCW: Risk Reduction Strategies

- Follow standard precautions
  - routinely wear mask if patient coughing or has uncontained respiratory secretions
- Implement cough etiquette by patients, visitors, HCW
- Apply mask on ill or coughing person for source control
- Conduct TB screening upon hire and annually
- Provide annual influenza vaccination
- Comply with Aerosol Transmissible Disease (ATD) standard

Pulmonary Tuberculosis (TB)

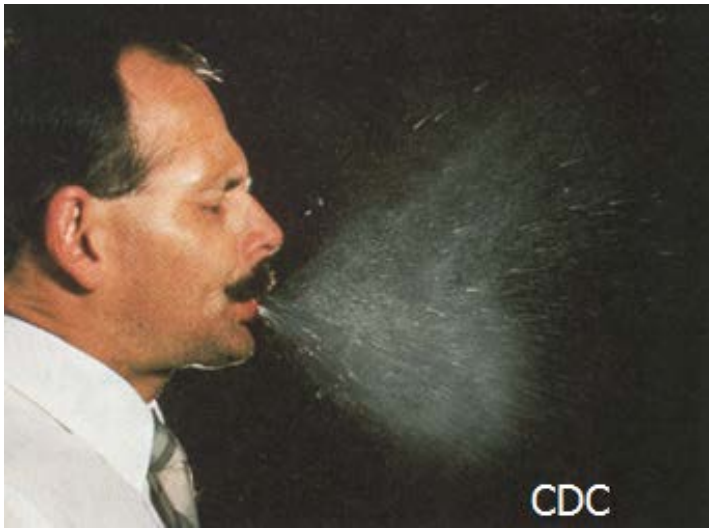
- Caused by bacteria *Mycobacterium tuberculosis*
- **A**cid **F**ast **B**acilli can be seen on a stained slide
- Serious chronic illness; can be fatal if untreated
- Transmitted by airborne route
  - Patient contact not required for exposure
  - Droplets can stay afloat for hours and travel on air currents
- Likelihood of transmission affected by
  - infectiousness of patient
  - environmental conditions
  - duration of exposure
- Most persons exposed do not become infected



Transmission of TB

Increased risk of transmission

- From infection person with
  - Forceful cough
  - Acid-fast bacilli (AFB) in sputum
  - Laryngeal disease
  - Cavitation on chest x-ray



- Undergoing cough-inducing procedures
- In small closed spaces with poor ventilation
- Failing to cover nose/mouth when coughing

Risk of TB Infection and Disease

Highest Risk for Infection

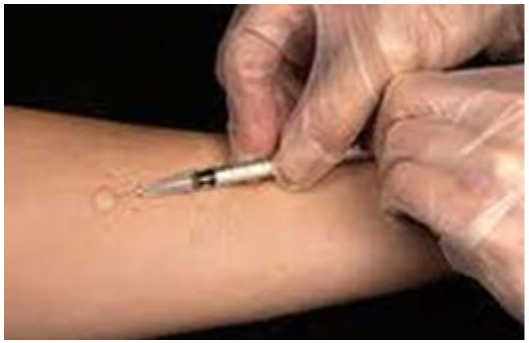
- Medically under-served, low income
- High-risk minority populations
- Persons who inject drugs
- Close contacts to suspect/ known cases
- Foreign-born from high prevalence areas
- Health care workers serving high risk patients

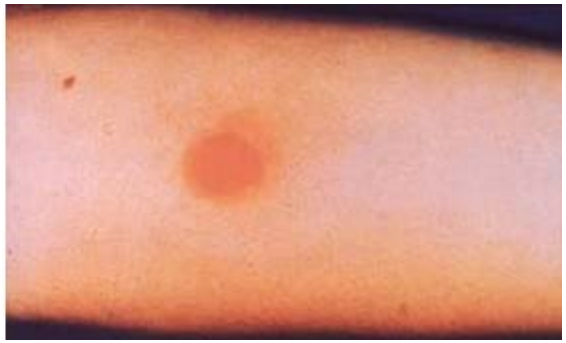
Highest Risk for Progression to Disease

- HIV infected, or otherwise immune compromised
- Recently infected with TB
- Certain chronic medical conditions
- IV drug abusers
- History of inadequately treated TB
- Stressors, such as recent immigration

Annual TB Testing

- Identifies health care workers newly infected with TB
  - Enables prompt treatment to minimize risk of respiratory disease





- Serves as an ongoing evaluation for effectiveness of TB prevention strategies
  - May identify improvement needs in control measures

TB Risk Assessment

- Determine HCP to be included in annual TB screening program
  - Annual skin testing/TB blood test
  - Review symptoms with previously positive employees
  - Annual chest x-ray not required
- Determine HCP to be included in Respiratory Protection Program, require fit testing
- Identify areas with increased risk for TB transmission
- Assess if adequate number of Airborne Infection Isolation Rooms
- Conduct periodic reviews of TB prevention strategies

CDC TB testing for healthcare workers
https://www.cdc.gov/tb/topic/testing/healthcareworkers.htm

Airborne Transmissible Disease (ATD) Standard

- Applies to all health care settings
  - Hospitals
  - Skilled nursing facilities
  - Hospices
  - Private medical offices
  - Paramedic and emergency services
  - And many others

Exceptions: dental offices and outpatient settings where ATDs are not diagnosed or treated

ATD Requirements

Written ATD Plan

- Policies & Procedures addressing ATD
  - Education & training for prevention
  - TB Screening
  - Post exposure management
- Provide seasonal influenza vaccination to all employees with potential for occupational exposure
- Engineering controls for management of patients with ATDs
- Fit testing for respiratory protection
- Maintenance of employee health records

Subchapter 7. General Industry Safety Orders, Group 16. Control of Hazardous Substances, Article 109. Hazardous Substances and Processes:

http://www.dir.ca.gov/title8/5199a.html

ATD Requirements

Written ATD Plan

- Policies & Procedures addressing ATD
  - Education & training for prevention
  - TB Screening
  - Post exposure management
- Provide seasonal influenza vaccination to all employees with potential for occupational exposure
- Engineering controls for management of patients with ATDs
- Fit testing for respiratory protection
- Maintenance of employee health records

Subchapter 7. General Industry Safety Orders, Group 16. Control of Hazardous Substances, Article 109. Hazardous Substances and Processes:

http://www.dir.ca.gov/title8/5199a.html

ATD Requirements - Engineering Controls

- Airborne Infection Isolation Room (AIIR)
  - 12 air exchanges per hour (ACH)

    AND

  - Daily verification of negative pressure (via smoke stick or flutter test) while room is occupied
- Powered Air Purifying Respirator (PAPR) for high hazard procedures
  - Includes sputum induction, bronchoscopy, intubation, open system suctioning, aerosolized nebulizer treatment

ATD Standard in Facilities Other than Hospitals

Many health care facilities are not equipped to care for persons ill with an ATD

- If a resident develops respiratory illness
  - Transfer within 5 hours
  - Do not transfer if detrimental to resident's condition
- In absence of AIIR, place ill patient in single room with door closed
  - May cohort with other ill patients
  - Employees wear an N95 respirator to enter

ATD Standard in Outpatient Settings

- Outpatient clinics do not provide same level of care as inpatient settings
  - Shorter duration of exposure
- Apply ATD Standard to extent feasible
  - Place person in separate room or area
  - Provide separate ventilation or filtration
  - Source control is primary; mask patient with surgical mask
  - In absence of source control, employee must wear N95 respirator or above when entering room or area

Additional References and Resources

- California Code Regulations, Title 8, Section 5193 (BBP ECP)
- Cal/OSHA Guidance for the 2010-2011 Influenza Season regarding the Application of the Aerosol Transmissible Diseases Standard, 2010
- CAL-OSHA ATD Standard http://www.dir.ca.gov/title8/5199.html
- CDC Guidelines for Preventing the Transmission of Mycobacterium tuberculosis in Health-Care Setting, 2005. http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5417a1.htm?s_cid=rr5417a1_e
- CDC Guidance for Evaluating Health-Care Personnel for Hepatitis B Virus Protection and for Administering Post-exposure Management *Recommendations and Reports,*62(RR10);1-19, 2013
- Kuhar et al. Updated U.S. Public Health Service guidelines for the management of occupational exposures to HIV and recommendations for post-exposure prophylaxis. CDC, 2013

Questions?

For more information,
please contact any
HAI Program Team member

Or email
HAIProgram@cdph.ca.gov