



BLOODBORNE PATHOGENS

UNIVERSAL PRECAUTIONS FOR THOSE EXPOSED TO BLOOD OR OTHER POTENTIALLY INFECTIOUS MATERIALS IN THEIR OCCUPATION

PROTECT YOURSELF

ALL BLOOD AND BODILY FLUID MUST BE TREATED AS IF THEY WERE INFECTED WITH:

- HUMAN IMMUNODEFICIENCY VIRUS (HIV) WHICH FREQUENTLY LEADS TO AIDS.
- HEPATITIS B VIRUS (HBV).
- OTHER BLOODBORNE PATHOGENS (MICROORGANISMS FOUND IN HUMAN BLOOD WHICH CAN CAUSE DISEASE).

KNOW THE RULES

BE FAMILIAR WITH YOUR ORGANIZATION'S EXPOSURE CONTROL PLAN.



MAKE SURE YOU KNOW:

- VACCINATION REQUIREMENTS
- PROCEDURES
- PRACTICES
- PROPER REPORTING REQUIREMENTS FOR INCIDENTS OF EXPOSURE.

KNOW YOUR COLORS

- RED BAGS OR CONTAINERS DON'T NEED TO BE LABELED - THEIR COLOR INDICATES THEY MAY CONTAIN BIOHAZARDS.
- FLUORESCENT ORANGE-RED LABELS AND SIGNS WITH CONTRASTING LETTERING OR SYMBOLS ARE APPROPRIATE

READ ALL LABELS AND SIGNS

WEAR THE RIGHT EQUIPMENT



PROPER PROCEDURE CAN REDUCE YOUR RISK OF INFECTION TO ZERO

WASH HANDS



AND FOLLOW SAFE HYGIENE AND WORK PRACTICES.

DISPOSE OF NEEDLES IN APPROPRIATE CONTAINERS.



FOLLOW PROPER DISPOSAL PROCEDURES.

CONTAMINATED LAUNDRY AND PERSONAL PROTECTIVE EQUIPMENT SHOULD BE DISPOSED OF IN PROPERLY DESIGNATED AREAS.



KEEP IT CLEAN

CLEAN WORKSITE AND DECONTAMINATE EQUIPMENT. FOLLOW ALL SAFE HANDLING PROCEDURES.

DON'T FORGET

ALL BODY FLUIDS SHOULD BE HANDLED AS IF POTENTIALLY INFECTIOUS.



BLOODBORNE PATHOGENS (BBP)

- Infectious microorganisms in human blood and other body fluids that can cause disease in humans
- These pathogens include, but are not limited to
 - **Hepatitis B Virus (HBV)**
 - Risk = 1-30%
 - **Hepatitis C Virus (HCV)**
 - Risk = 0-7%
 - **Human Immunodeficiency Virus (HIV)**
 - Risk = 0.2-0.5%

BODY FLUID EXPOSURE RISK



**Higher Risk
Body Fluids**

Higher risk body fluids

- Blood
- Amniotic fluid
- Peritoneal fluid
- Cerebrospinal fluid
- Pleural fluid
- Vaginal fluid/Semen
- Any body fluid with visible blood (saliva after dentist)



**Low/No Risk*
body fluids**

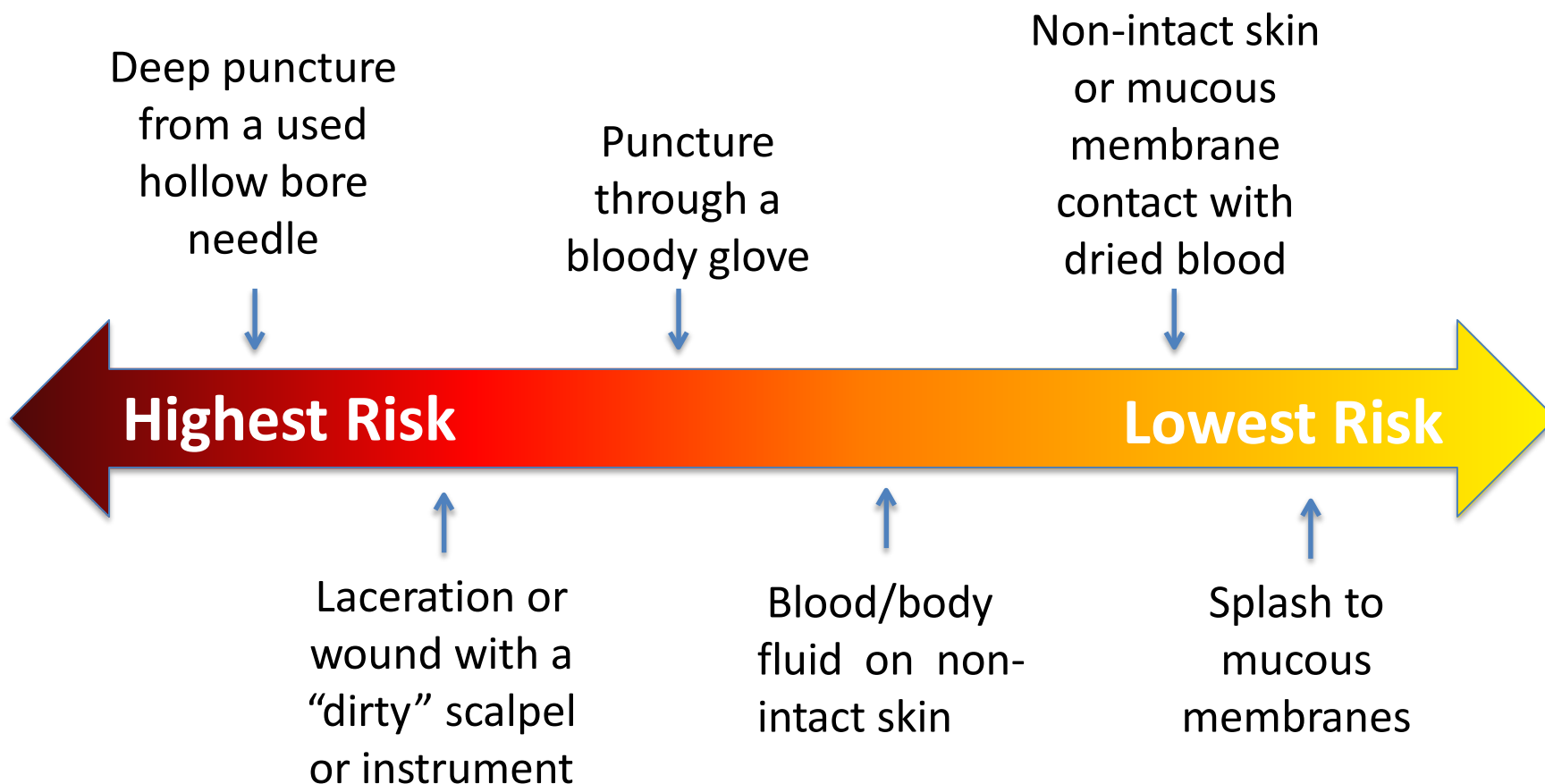
Low/No Risk* body fluids

- Sweat
- Tears
- Feces
- Saliva
- Urine
- *Unless visibly contaminated with blood



EXPOSURE RISK BY INJURY TYPE:

Infection risk is dependent on type of exposure





OSHA BLOODBORNE PATHOGEN (BBP) STANDARD

Prescribes safeguards to protect workers against the health hazards caused by bloodborne pathogens

- Addresses items such as
 - Exposure control plans
 - Universal precautions
 - Engineering and work practice controls
 - Personal protective equipment
 - Housekeeping
 - Laboratories
 - Hepatitis B vaccination
 - Post-exposure follow-up
 - Hazard communication and training
 - Recordkeeping
- Requirement placed on employers whose workers can be reasonably anticipated to contact blood or other potentially infectious materials (OPIM), such as unfixed human tissues and certain body fluids



NEEDLESTICK SAFETY AND PREVENTION ACT

- Signed into law on November 6, 2000
- Modification of OSHA's Bloodborne Pathogens standard
 - Make more specific OSHA's requirement for employers to identify, evaluate and implement safer medical devices such as needleless systems and sharps with engineered sharps protections
- Mandated additional requirements for
 - Maintaining a sharps injury log
 - Involvement of non-managerial healthcare workers in identifying, evaluating and choosing effective engineering and work practice controls
 - These are workers who are responsible for direct patient care and be potentially exposed to injuries from contaminated sharps

SHARPS INJURIES

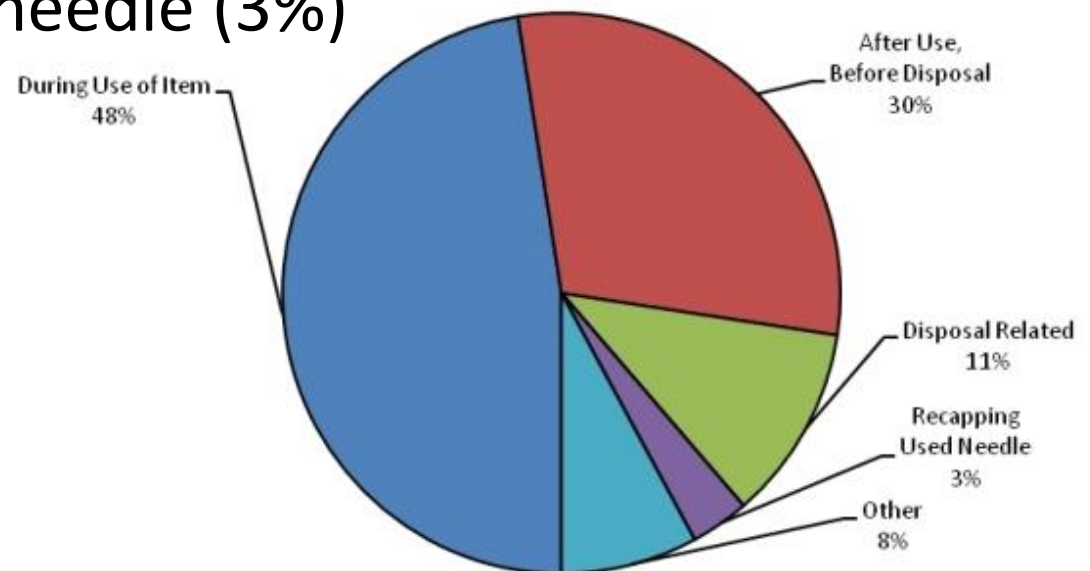


Approximately 385,000 needle sticks and other sharps injuries occur in hospital-based healthcare personnel each year

HOW DO SHARPS INJURIES OCCUR

Injuries occur most frequently due to work practices and inappropriate sharps disposal

- During use of sharp (48%)
- Activities after use and prior to disposal (30%)
- Disposal-related activities (11%)
- Recapping a used needle (3%)
- Other (8%)





PREVENTING BLOODBORNE PATHOGEN EXPOSURE

- Standard Precautions mandatory
- Hepatitis B Virus (HBV) vaccination series offered to all staff with potential for blood exposure
- Hierarchy of prevention methods applies
 - Engineering controls: needless devices
 - Work practice controls – no recapping
 - Appropriate cleaning, linen-handling, disposal of sharps
- BBP Training required upon hire, annually and as needed
- Facilities must have a BBP Exposure Control Plan
 - Employees must be given opportunity to contribute to product evaluation for sharps safety
- Post-exposure prophylaxis (PEP) immediately available

SHARPS DISPOSAL

Sharps disposal containers must require minimal training to use, and they must be

- Puncture-resistant
- Durable during installation and transport
- An appropriate size and shape for the task
- Clearly visible
- Easy to access
- Placed in an upright position
- Easy to operate
- Easy to store and assemble



How Would You Select Safety Sharps?

Review Exposure Log for trends

Search top sharp manufacturers for devices available



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Conduct trials for staff input



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Work with Purchasing

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Work with nursing leadership for final selection and implementation



FOLLOWING BLOOD OR BODY FLUID EXPOSURES - NEEDLESTICK OR SPLASH TO MUCOUS MEMBRANES

Wash the site with soap and water until clean



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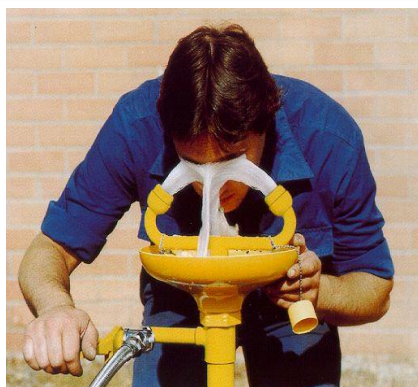
Wash the site with soap and water until clean



Flush splashes to the nose, mouth or skin with water



Irrigate eyes with clean water, saline or sterile irrigant



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Irrigate eyes with clean water, saline or sterile irrigant



Report the incident to supervisor immediately



Report to Employee Health for evaluation of exposure



Immediately seek medical evaluation per facility policy



BBP POST-EXPOSURE MANAGEMENT: MEDICAL EVALUATION

Immediate testing:

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

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



POST-EXPOSURE PROPHYLAXIS FOR HEPATITIS B

Vaccination and antibody status of <u>Exposed</u>	Treatment for <u>Employee</u> when <u>source is HBsAg-</u>	Treatment for <u>Employee</u> when <u>source is HBsAg+</u>
Unvaccinated	Initiate Hepatitis B vaccine series	HBIG x1 & initiate Hepatitis B vaccine series
Previously Vaccinated:		
Known Responder	No treatment	No treatment
Known-non-responder	If known high risk source, treat as if source were HBsAg positive	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 vaccine booster and recheck titer in 1-2months	Test exposed person for anti-HBs 1. If adequate, no treatment 2. If inadequate HBIG x1 & vaccine booster



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

- If indicated, send to MD for assessment for PEP management as soon as possible after exposure
 - Regard as an urgent medical concern; hours rather than days
 - Ensure CBC, liver panel, pregnancy test done prior to initiation of meds
 - Provide counseling about potential side effects of medications
 - Monitor for potential toxicity
- Interval after which PEP is no longer effective is unknown
 - Initiating days or weeks after exposure might be considered for higher risk exposure



AEROSOL TRANSMISSIBLE DISEASES





AEROSOL TRANSMISSIBLE DISEASES (ATD)

- A disease or pathogen for which droplet or airborne precautions are required
- Diseases or pathogens requiring **Airborne Infection Isolation**
 - Tuberculosis (*Mycobacterium tuberculosis*)
 - Measles Virus
 - Varicella disease
 - Avian influenza
 - Other less common pathogens



AEROSOL TRANSMISSIBLE DISEASES (ATD)

- A disease or pathogen for which droplet or airborne precautions are required
- Diseases or pathogens requiring **Droplet Precautions**
 - Influenza (seasonal)
 - Mycoplasma pneumonia
 - Pertussis (whooping cough)
 - Other less common pathogens

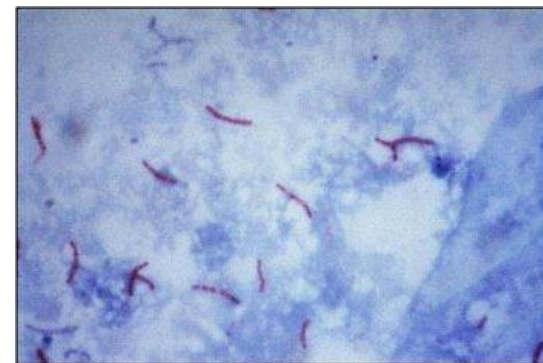


PULMONARY TUBERCULOSIS (TB) IN LONG-TERM CARE

- In 2014 there were 62 cases of Tuberculosis diagnosed in long-term care facilities in California
- More than 30% of all cases reported in persons 65 years of age and older

PULMONARY TUBERCULOSIS (TB)

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





TB INFECTION AND DISEASE

Latent Tuberculosis

- Exposed to TB bacillus
- No symptoms
- TB skin test positive
- Chest x-ray negative
- **Is not communicable**
- **No isolation required**

Active Tuberculosis

- Exposed to TB bacillus
- Manifests symptoms of Tuberculosis
- TB skin test positive
- AFB smears positive
- Abnormal chest x-ray
- **Is communicable**
- **Airborne Infection Isolation required**

TRANSMISSION OF TB

- Increased risk of transmission
- From infection person with
 - Forceful cough
 - Acid-fast bacilli (AFB) in sputum
 - Laryngeal disease
 - Cavitation on chest xray
- Undergoing cough-inducing procedures
- In small closed spaces with poor ventilation
- Failing to cover nose/mouth when coughing





<https://youtube/9112brXCOVc>



CDC Tuberculosis (TB) Transmission
and Pathogenesis Video



SYMPTOMS OF ACTIVE PULMONARY TUBERCULOSIS

- Cough
- Hemoptysis
- Shortness of breath or dyspnea
- Fever
- Night sweats
- Fatigue
- Unexplained weight loss



AIRBORNE TRANSMISSIBLE DISEASE (ATD) STANDARD

Preventing and protecting employees from occupational exposures to known and novel pathogens that may cause illnesses through aerosol generation

- Applies to all health care settings, including
 - Hospitals
 - **Skilled nursing facilities**
 - Hospices
 - Private medical offices
 - Paramedic and emergency services
 - Other settings



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 residents with ATDs
- Fit testing for respiratory protection
- Maintenance of employee health records



PREVENTION OF ATDs IN HCW

Risk reduction strategies include

- Standard Precautions
 - Routinely wear mask if resident coughing or has uncontained respiratory secretions
- Cough etiquette by residents, visitors, health care workers
- TB screening upon hire and annually
- Annual influenza vaccination
- Comply with Aerosol Transmissible Disease (ATD) Standard
- Isolation of residents with suspect or confirmed ATDs

TB SCREENING OF HEALTHCARE WORKERS

On Hire

- 2-step PPD skin test
 - Negative reading required on first PPD before beginning work
 - Second step 1-3 weeks after first
- Interferon-Gamma Release Assay (IGRA)
- TB symptom review questionnaire

Annual

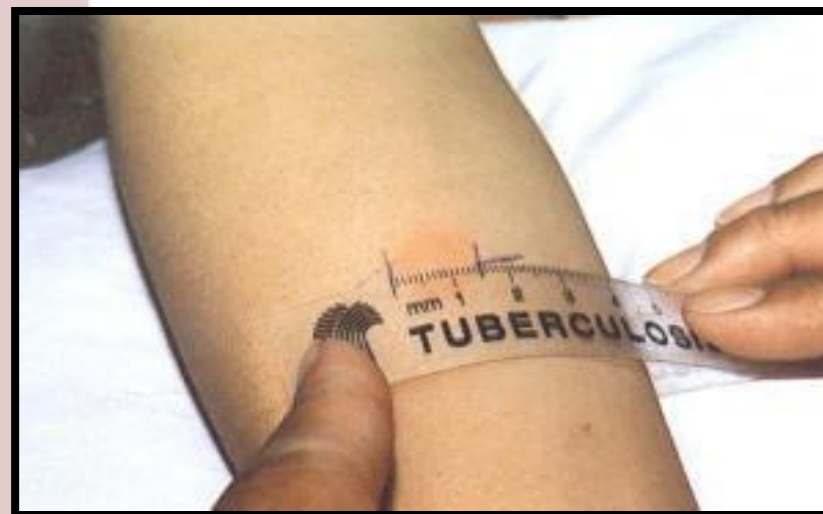
- Prior negative PPD
 - One step PPD
- Prior positive PPD
 - TB symptom review questionnaire
- Chest X-ray not required unless
 - Sign or symptom present or
 - Positive answers to TB questionnaire



TB SCREENING OF HEALTHCARE WORKERS

Interpretation of PPD

- PPD test read 48-72 hours after administration
- Read only by trained personnel
- Measure only by induration
- Document results in millimeters of induration
 - Not “positive” or “negative”
 - 5mm or greater = positive if recently exposed to active TB care or immunocompromised (e.g., HIV)
 - 10mm or greater = positive for everyone else





TB POST-EXPOSURE FOLLOW-UP FOR HCWs

Exposure Follow-Up

Unprotected exposure

- Baseline PPD
- Re-test 8-10 weeks later
 - If negative – no further follow-up
 - If positive – refer to health care provider



AIRBORNE INFECTION ISOLATION

**For residents
known or
suspected to be
infected with
pathogens
transmitted by
the airborne
route**

- **Place in Airborne Infection Isolation Room (AIIR)**
 - **Private room with negative pressure air flow**
 - **Daily verification negative pressure is maintained**
 - **6-12 air exchanges per hour**
 - **Air exhausts to the outside – does not recirculate in facility**
 - **Use N-95 respirator upon entering room**
 - **Cough etiquette**
 - **If AIIR is not available**
 - **Transfer as soon as possible to a facility with AIIR**



DROPLET PRECAUTIONS

For residents known or suspected to be infected with pathogens transmitted by respiratory droplets generated when coughing, sneezing, or talking

- **Place in private room, if available**
 - **Cohort - evaluate case-by-case basis considering risk to other residents**
- **Use personal protective equipment (PPE) appropriately**
 - **Don procedure mask upon entry to room or resident space (i.e., within 3 feet of resident)**
- **Cough etiquette**



SUMMARY

- Healthcare workers are at risk of exposure to bloodborne pathogens and aerosol transmissible diseases
- OSHA Bloodborne Pathogen and Aerosol Transmissible Disease Standards prescribe safeguards to protect HCWs
 - Vaccination and screening
 - Work restrictions
 - Safety devices
 - Isolation precautions
 - Exposure follow-up



REFERENCES AND RESOURCES

- *Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV and HIV and Recommendations for Postexposure Prophylaxis*, CDC, MMWR, June 29, 2001 / Vol 50 / No. RR-11
- Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HIV and Recommendations for Postexposure Prophylaxis. (2013). <http://stacks.cdc.gov/view/cdc/20711>
- California Code Regulations, Title 8, Section 5193 (BBP ECP)
- 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
http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5417a1.htm?s_cid=rr54_17a1_e
- Cal/OSHA Guidance for the 2010-2011 Influenza Season regarding the Application of the Aerosol Transmissible Diseases Standard (Issue Date: 11/5/2010)
- PEPline at <http://nccc.ucsf.edu/clinician-consultation/post-exposure-prophylaxis-pep>; telephone 888-448-4911
- Joint Guidelines for Prevention and Control of Tuberculosis in CA Long Term Health Facilities. California Department of Public Health www.cdph.ca.gov/
- <http://stacks.cdc.gov/view/cdc/20711>



Questions?
Thank you

