



Protecting SNF Employees from Bloodborne Pathogens and Aerosol Transmissible Diseases

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Overview of Presentation

- ▶ Introduction
- ▶ What are BBPs and ATDs? Where do you encounter them in your work?
- ▶ What measures are required by Cal/OSHA to protect you and your coworkers?

Acknowledgments

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Sources of information on infection control



Healthcare Worker Protection

- ▶ **Guidance documents**
 - ▶ CDC and other government agencies
 - ▶ Professional guidelines
- ▶ **Licensing and certification**
- ▶ **Union provisions**
 - ▶ Contract language
 - ▶ Collective action
- ▶ **Cal/OSHA regulations**

What is Cal/OSHA?

“ Every employer shall furnish employment and a place of employment that is safe and healthful for the employees therein. ”

California Labor Code Section 6400

Cal/OSHA and Biological Agents

- ▶ 1993: Cal/OSHA Bloodborne Pathogen Standard (Title 8, §5193)
- ▶ 2009: Cal/OSHA Aerosol Transmissible Disease Standard (Title 8, §5199)
- ▶ Other standards for chemicals, MSDs, slips and falls, **workplace violence**

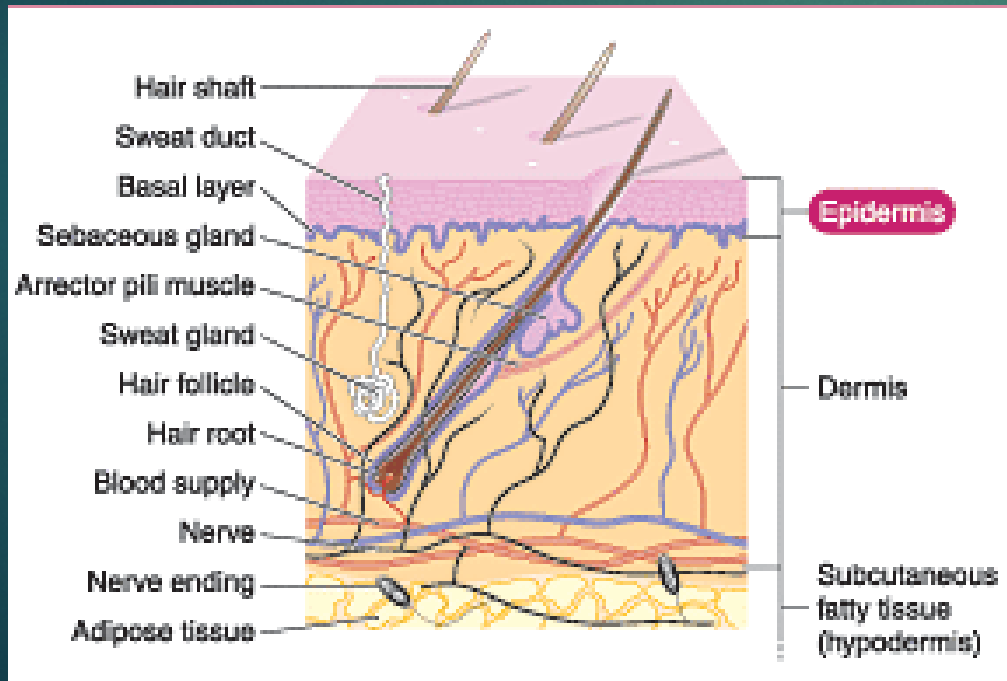




What are BBPs
and ATDs?

Bloodborne Pathogens

An infectious agent, carried in the blood or other bodily fluids, capable of causing infection in others.



The epidermis of intact skin is an effective barrier against most infections. A BBP infection requires:

- A skin break (puncture, skin abrasion)
- Mucous membrane contact (spray or splash) to:
 - Eyes
 - Mouth
 - Genitalia

Bloodborne Pathogens

- ▶ Most important:
 - ▶ HIV
 - ▶ Hepatitis B
 - ▶ Hepatitis C
- ▶ Others:
 - ▶ Syphilis
 - ▶ Malaria
 - ▶ Viral hemorrhagic fever (Ebola, Marburg, Lassa)
 - ▶ Gonorrhea?
 - ▶ Babesiosis*
 - ▶ Brucellosis*
 - ▶ Cytomegalovirus*
 - ▶ Arboviruses (viral meningitis)*

* = only by transfusion.
Probably NOT by needlestick)



Bloodborne Pathogens

- ▶ **Cal/OSHA:** "...Pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV)."
- ▶ Cal/OSHA standard also covers contact with certain body fluids → **Other Potentially Infectious Materials (OPIM)**

Other Potentially Infectious Materials

- ✓ Semen
- ✓ Vaginal secretions
- ✓ Body fluids such as pleural, cerebrospinal, pericardial, peritoneal, synovial, and amniotic
- ✓ Saliva (esp. in dental procedures)
- ✓ Any body fluids visibly contaminated with blood



Note: Sweat, tears, and urine (unless bloody) are *not* OPIM

OPIM – Saliva as a special case

- ▶ During dental procedures, assume saliva to be bloody, with potential for transmission of HIV, Hep B, and Hep C
- ▶ For human bites, or other exposure to non-bloody saliva:
 - ▶ Risk of HIV transmission is negligible;
 - ▶ Risk of Hep B and Hep C is low, but not zero (post-exposure medical evaluation is needed)



Human bite



There are 50,000–100,000 BBP exposures in California HCWs per year

- ▶ **Hollow-bore needle sticks** – about 60% of injuries
 - ▶ In hospitals, rate is 20-30 per 100 beds per year
 - ▶ Equivalent to 3-10 per 1,000 clinical workers/year
 - ▶ Mostly in patient rooms, operating rooms, and ER
 - ▶ Under-reporting is 50-70%
- ▶ **Other “sharps” injuries** (mostly scalpels and surgical needles) – about 25% of injuries
 - ▶ Blunt surgical needles – decreases risk by about 67%
 - ▶ Surgical sharps tray and hand-off devices available
 - ▶ Acupuncture needles (rate?)
- ▶ **Splashes in eyes or mouth**

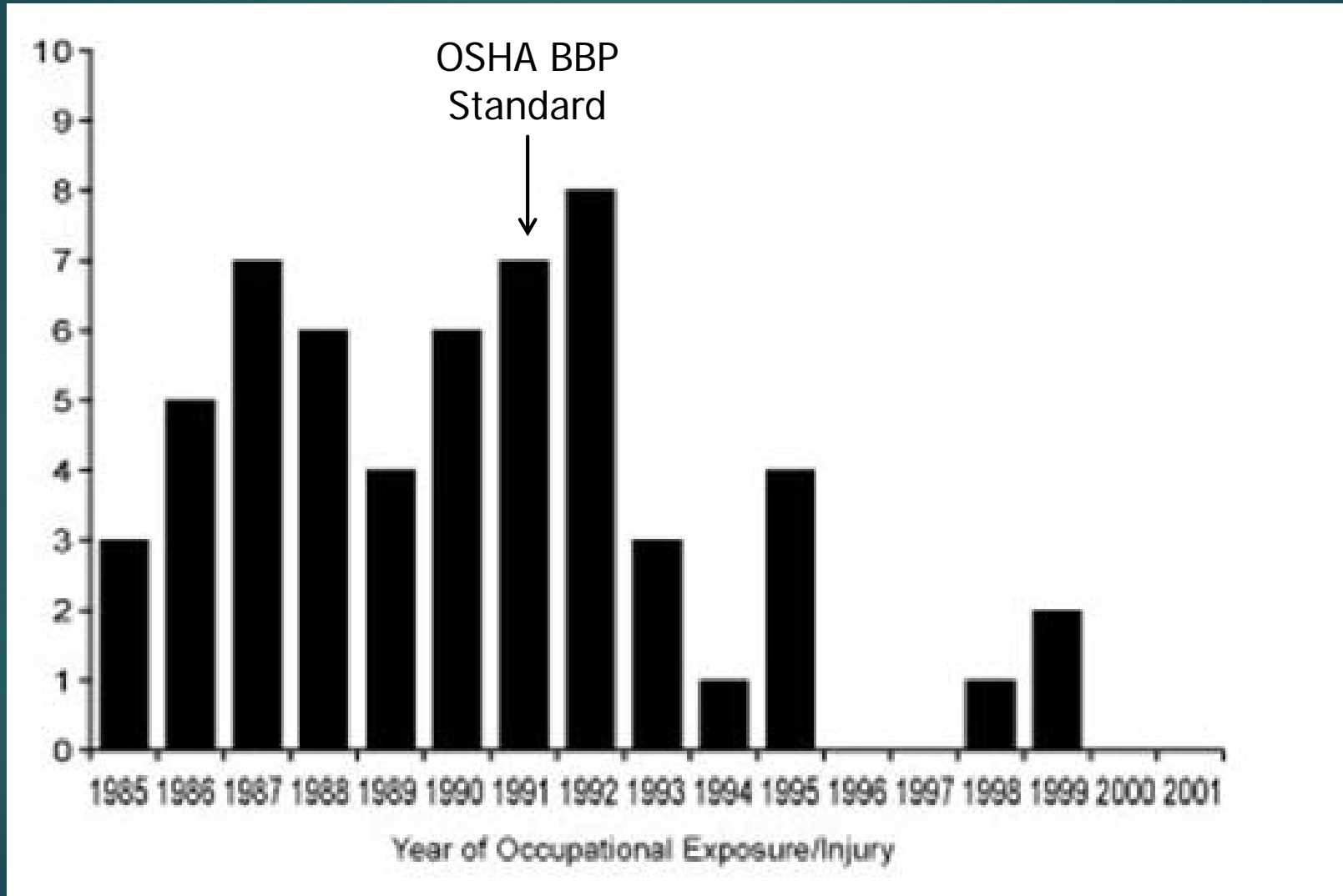
Activities Most Frequently Associated with Sharps Injuries in California*

Injection	21.9%
Drawing venous blood	19.7%
Suturing	10.6%
Starting or discontinuing IV	10.2%
Procedures	9.6%
Manipulation of IV ports	7.9%
Cutting	6.3%
Finger/heel stick	4.0%



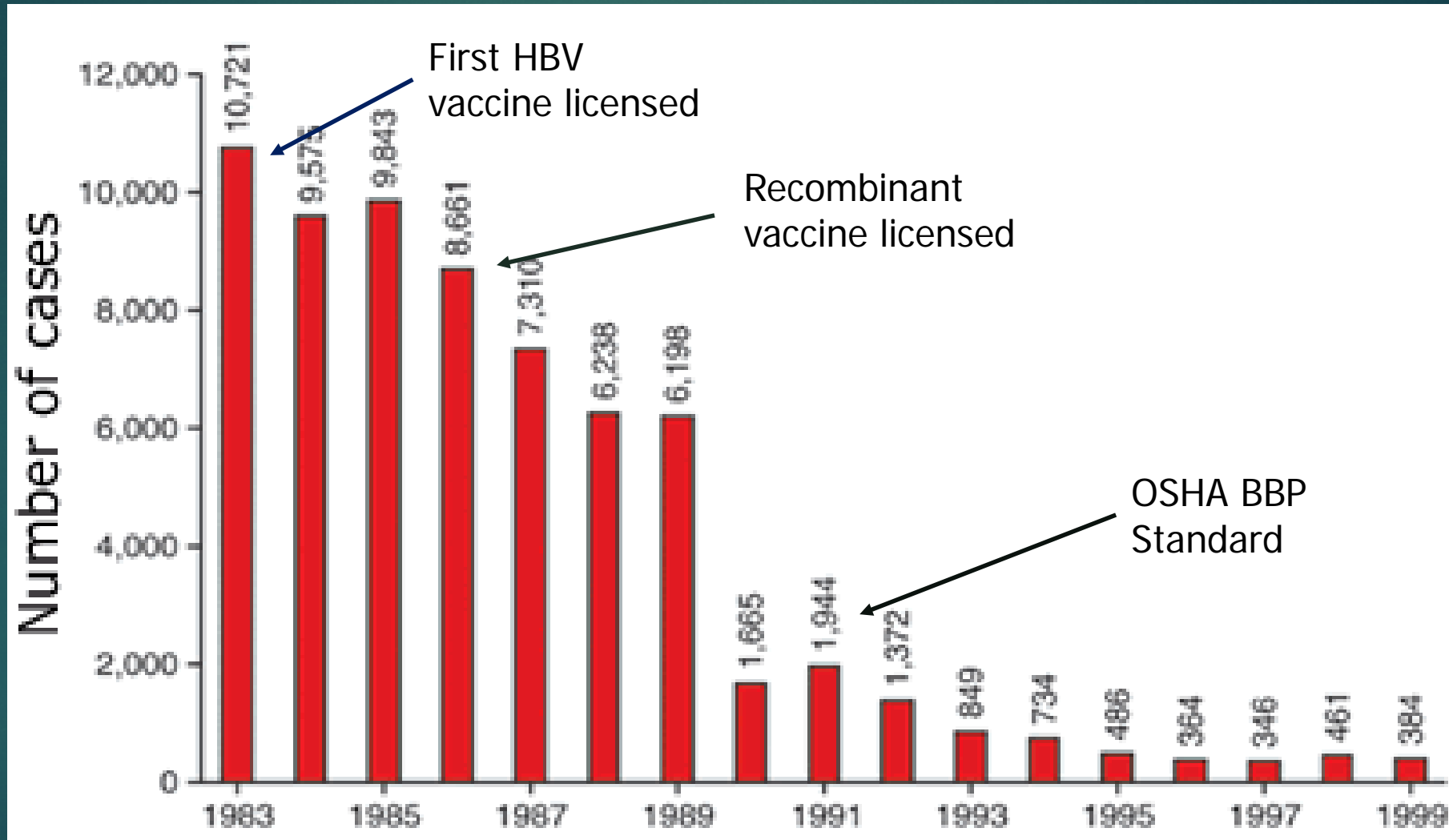
* California Sharps Injury Control Program

Occupationally acquired HIV, by year



Source: CDC: Health Care Associated Infections (last update, May 2011)

HBV Infections in Healthcare Workers



Centers for Disease Control and Prevention 2002

True or False?

Hepatitis B is easily cured.

True or False?

Using "Standard Precautions" means handling all blood and body fluids as if they are contaminated.

Standard Precautions

- Treat ALL body fluids as contaminated
 - ▶ Hand hygiene
 - ▶ Use of PPE
 - ▶ Safe injection practices
 - ▶ Safe handling of potentially contaminated equipment or surfaces in the patient environment
 - ▶ Respiratory hygiene/cough etiquette

Aerosol Transmissible Diseases



Aerosol Transmissible Diseases

- ▶ Diseases caused by microorganisms that travel (or are “transmitted”) from person to person through fine particles in the air (“aerosol”)
- ▶ Coughing, sneezing, talking, etc. generate **particles of different sizes**
 - ▶ Some particles remain **suspended in air** (airborne)
 - ▶ Other heavier particles **settle more quickly on surfaces** (droplets)

Aerosol Transmissible Diseases

"Aerosol" = Airborne *and* Droplet

Aerosol Transmissible Diseases

VIDEO: How sneezes spread

A

At time = 0, an aerosol is generated by person A.
Person B receives droplet spray and intakes particles.
Person C has no exposure.

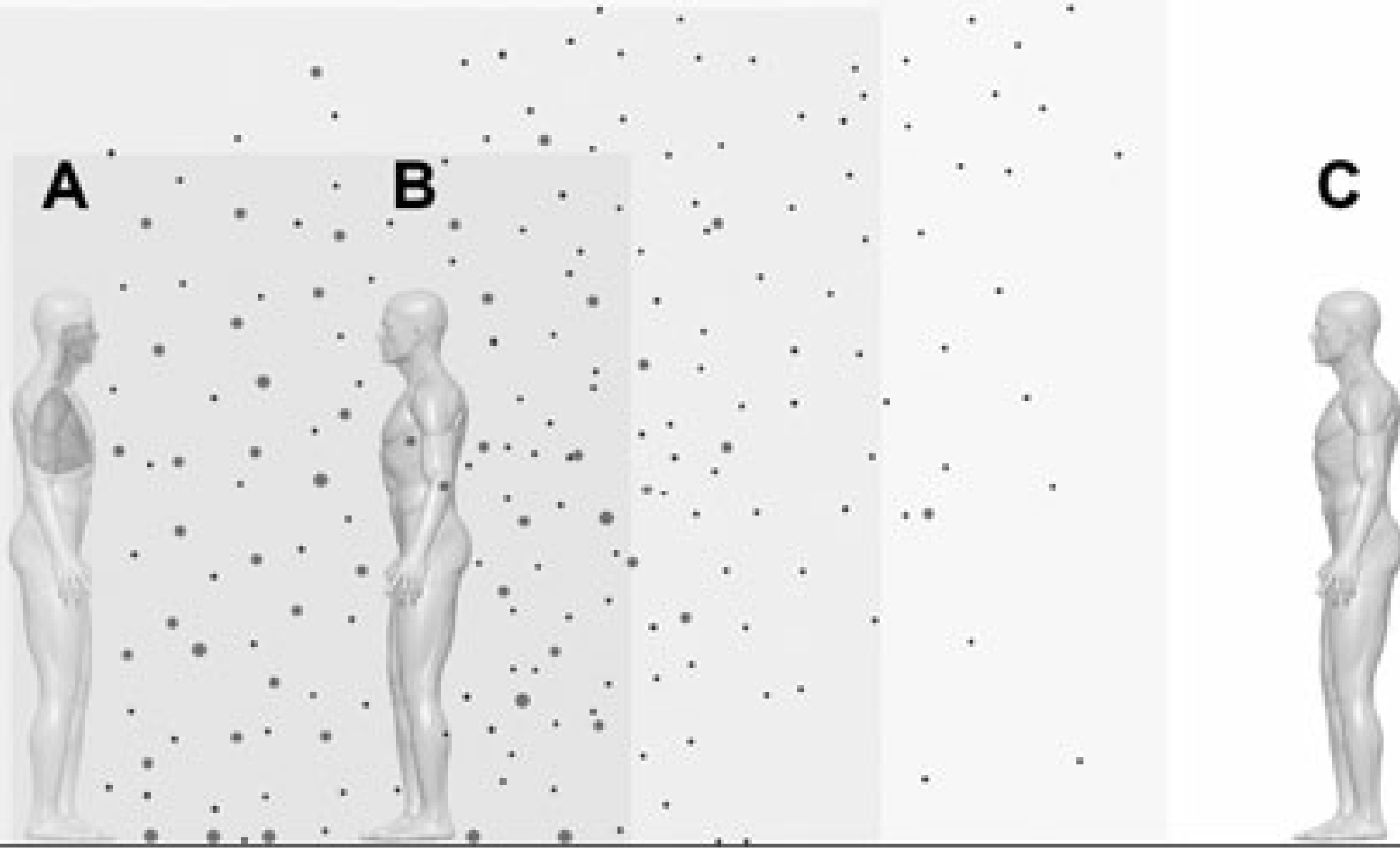
A

B

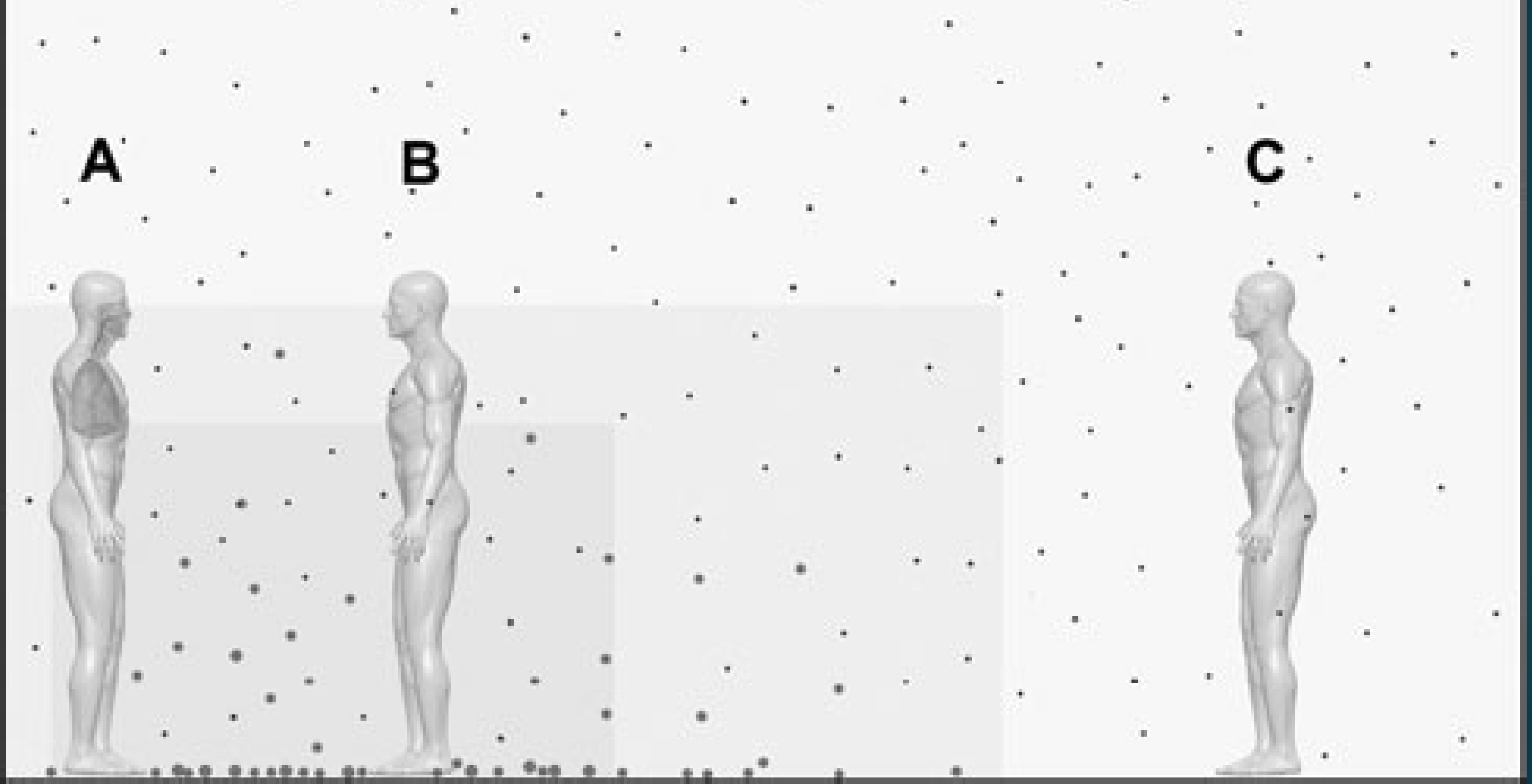
C



B At time = 1, the aerosol is dispersing, and many larger particles are settling. Person B inhales particles. Person C has no exposure.



C At time = 2, the aerosol is dispersed, and many larger particles have deposited on the floor. Persons B and C inhale particles.



True or False?

Using Standard Precautions prevents the spread of ATDs.

Precautions in Healthcare Settings

Standard precautions

Droplet precautions

Airborne isolation

Contact precautions



DROPLET PRECAUTIONS
(In addition to Standard Precautions)

Families and Visitors follow instructions on information sheet.
(If you have questions, go to Nurse Station)

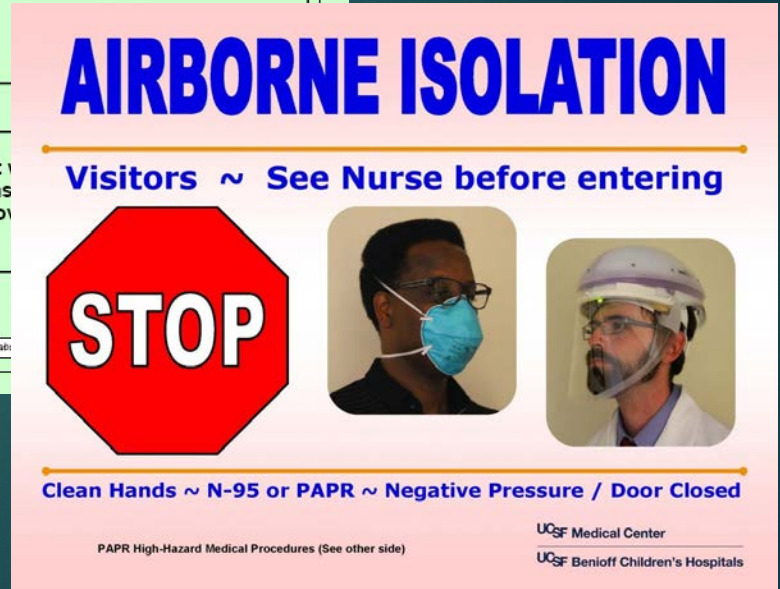
Everyone must:

-  Clean hands when entering and leaving room
-  Wear mask

Doctors and Staff must:

-  If contact with secretions, wear gown, gloves, and shoe cover



Washington State Hospital Association
Washington Hospitals - Collaborative



AIRBORNE ISOLATION

Visitors ~ See Nurse before entering

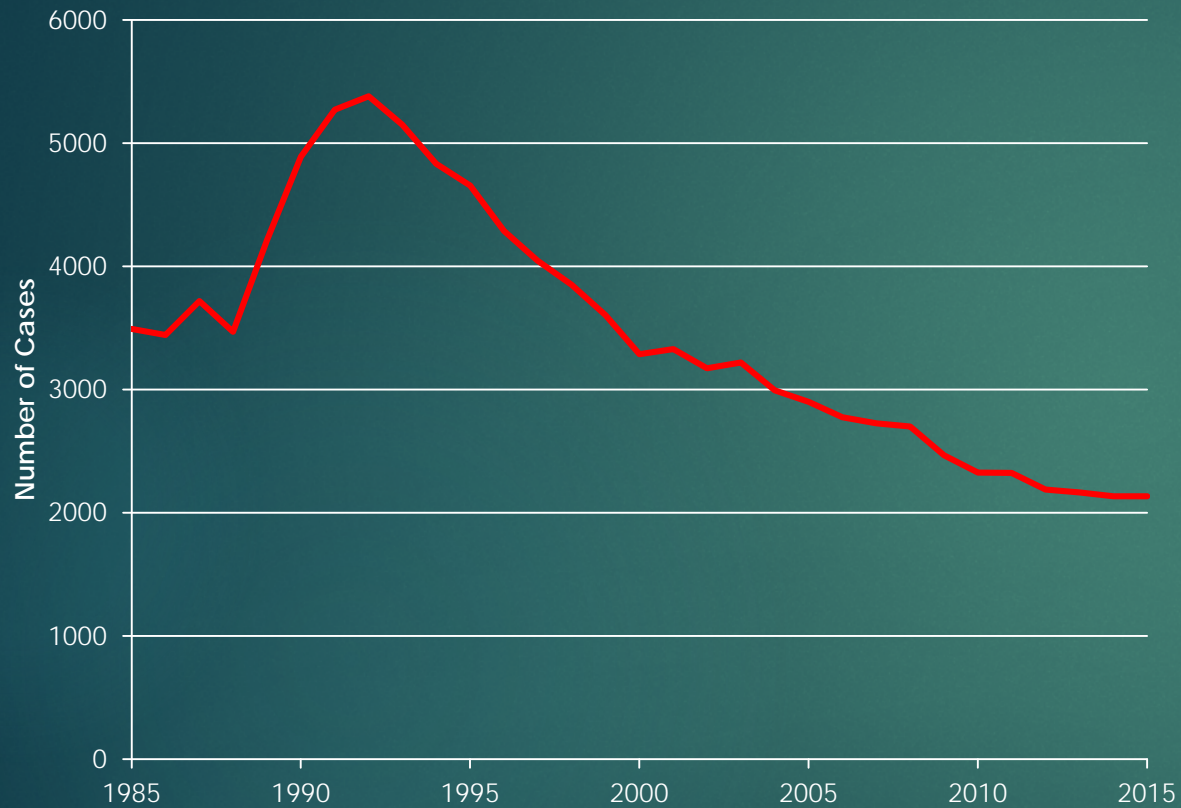
STOP

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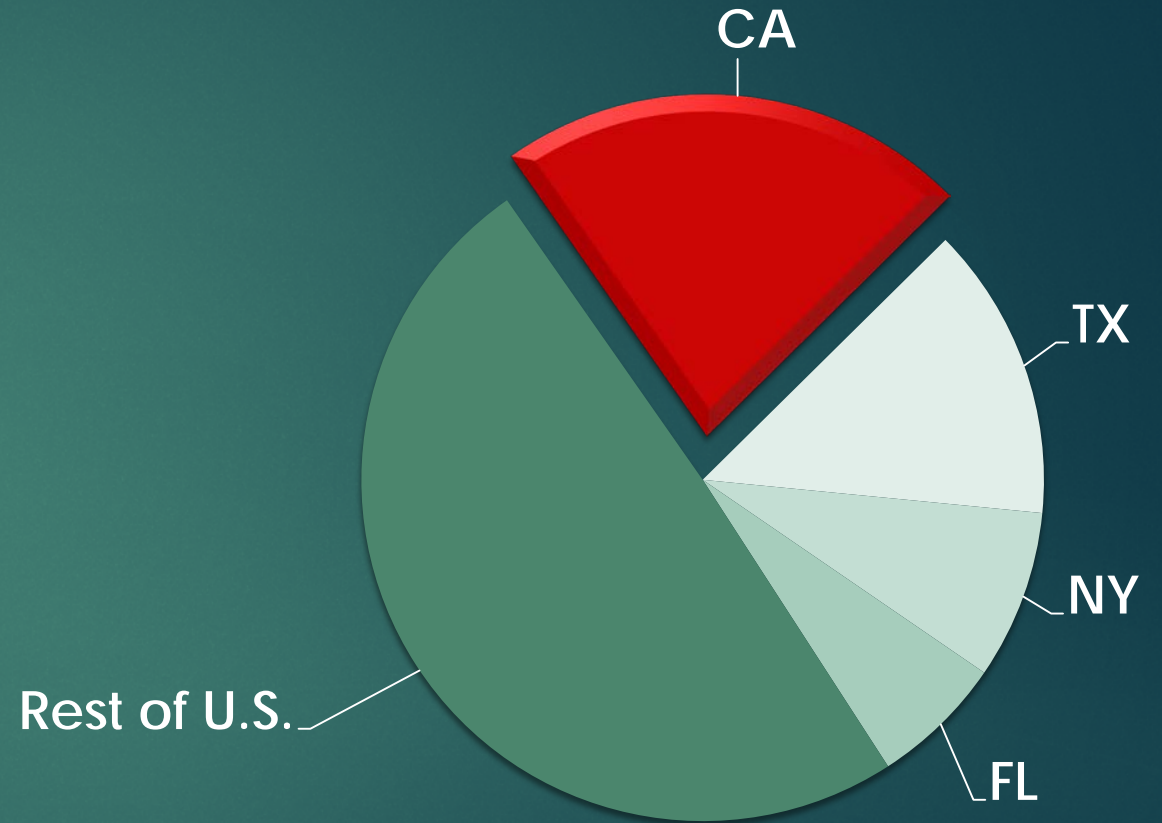
Clean Hands ~ N-95 or PAPR ~ Negative Pressure / Door Closed

PAPR High-Hazard Medical Procedures (See other side)
UCSF Medical Center
UCSF Benioff Children's Hospitals

Tuberculosis in California



TB cases in California



Proportion of TB cases, by state

Airborne Infectious Diseases

Tuberculosis

Chickenpox (Varicella)

Herpes zoster (varicella-zoster, disseminated disease)

Measles (rubeola)

Avian influenza capable of causing serious human disease

Monkeypox

SARS (Severe Acute Respiratory Syndrome)

Smallpox

Airborne spore release (e.g. anthrax) until decon

Cal/OSHA added:

Any other disease or pathogen for which airborne isolation is recommended

Novel or unknown pathogens

Droplet Diseases

Influenza

Meningococcal disease

Mumps

Mycoplasma pneumonia

Pertussis

Rubella

Diphtheria

Plague (pneumonic)

Cal/OSHA added:

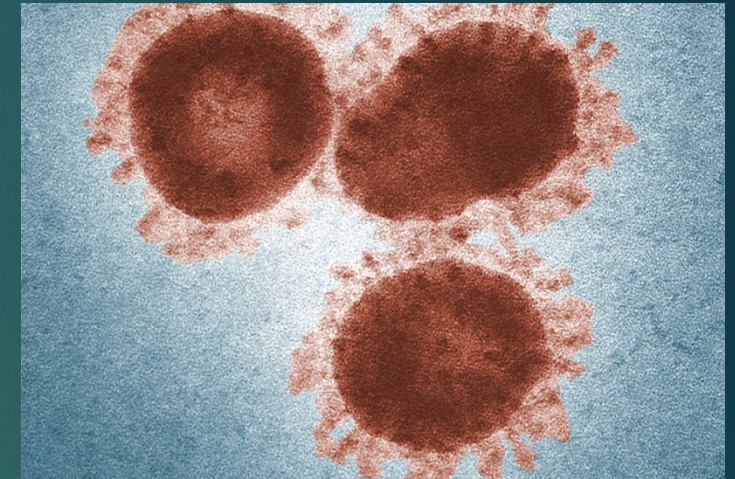
Any other disease or pathogen for which droplet precautions recommended


True or False?

Healthcare workers are at a greater risk for ATDs than the general public during a pandemic.

The SARS Experience

- ▶ February 2003 Severe Acute Respiratory Syndrome (SARS) first recognized in Asia
 - ▶ 8096 recorded cases; 774 deaths
- ▶ HCWs were 30 percent of all cases in Hong Kong
 - ▶ Nursing personnel were 55% of HCW cases
- ▶ HCWs were 45 percent of 375 SARS cases in Ontario
 - ▶ One physician and two nurses died





There was "...debate during SARS over whether SARS was transmitted by large droplets or through airborne particles. The point is not who was right and who was wrong in this debate. When it comes to worker safety...we should not be driven by the scientific dogma of yesterday or even the scientific dogma of today. **We should be driven by the precautionary principle that reasonable steps to reduce risk should not await scientific certainty.**"

SARS Commission Final Report, Volume 3, p. 1157



The Cal/OSHA BBP Standard

Case #1: BBP Exposure

- ▶ Facility A had established a container for patients to dispose of contaminated sharps
- ▶ Employees collected these containers, opened them, and emptied them into larger boxes for waste pick up
- ▶ Employees often reached into the containers by hand to gather all discarded sharps

Case #1: BBP Exposure

- ▶ Contaminated sharps shall not be stored or processed in a manner that requires employees to reach by hand into the containers
- ▶ The contents of sharps containers shall not be accessed unless properly reprocessed or decontaminated
- ▶ Sharps containers shall not be opened, emptied, or cleaned manually or in any other manner which would expose employees to the risk of sharps injury

Cal/OSHA BBP Standard

Coverage:

All workplaces with potential *occupational exposure*
(specific, identifiable activities)

Cal/OSHA BBP Standard

Exposure Control Plan:

- ▶ Written plan that addresses potential BBP hazards posed by specific activities and services at the facility
- ▶ Identifies person responsible for maintaining and implementing the plan
- ▶ Reviewed at least annually and updated as needed
- ▶ **Non-management employees must have opportunity for input on plan**

Cal/OSHA BBP Standard

Control Measures :

- ▶ Sharps containers – *must be accessible at point of sharps use*
- ▶ Use of engineered sharp safety devices
- ▶ Routine and terminal cleaning and disinfection of rooms
- ▶ Cleaning and disinfecting of common items
- ▶ Handling of contaminated waste
- ▶ Availability of PPE – gloves, gowns, eye/face protection

Cal/OSHA BBP Standard

Control Measures:

- ▶ Prohibited practices
 - ▶ Bending, recapping and removal of contaminated sharps
 - ▶ Reaching into containers for reusable sharps by hand
 - ▶ Mouth pipetting
 - ▶ Picking up broken glass by hand
- ▶ **Non-management employees must have opportunity for input on selection of engineering and work practice controls**

True or False?

An employee who is allergic to latex or vinyl shouldn't wear gloves.

Cal/OSHA BBP Standard

Preventive Medical Services:

- ▶ Vaccinations for Hepatitis B
 - ▶ Vaccinations must be provided as employer expense
 - ▶ Employees may decline vaccination

Post-Exposure Procedures:

- ▶ Post-exposure treatment and follow-up after potential exposure incidents

Cal/OSHA BBP Standard

Sharps Injury Log:

- ▶ Record of sharps injuries
- ▶ Requirement for *“an effective procedure for periodic determination of the frequency of use of the types and brands of sharps involved in exposure incidents...”*
- ▶ **Should contain employee’s opinions regarding how the incident could be prevented**
- ▶ Sharps injuries also required to be listed on OSHA Form 300

Cal/OSHA BBP Standard

Employee Training:

- ▶ Initial and annual training for employees with potential occupational exposures
- ▶ Must include site-specific BBP hazards and control measures in the workplace, proper use of PPE, cover all aspects of the exposure control plan
- ▶ **Must provide opportunities for interactive questions and answers**

Cal/OSHA BBP Resources

Cal/OSHA BBP Standard


<https://www.dir.ca.gov/title8/5193.html>

BBP FAQs

<http://www.dir.ca.gov/dosh/BloodborneFAQ.html>

Creating a BBP Exposure Control Plan

https://www.dir.ca.gov/dosh/dosh_publications/expplan2.pdf



The Cal/OSHA ATD Standard

True or False?

California is the only state in the country with an occupational health standard for aerosol transmissible diseases.

Case #2: ATD Exposure

- ▶ A police welfare check found a patient unconscious in his home. The fire department and an ambulance service arrived at the scene and transported the patient to Hospital A.
- ▶ About a dozen healthcare providers worked on the patient in the ED of Hospital A, including intubation. The following day, the patient's cerebrospinal fluid and blood tested positive for gram negative diplococci bacteria. Two days later, *N. meningitides* (bacterial meningitis) was confirmed in the patient's blood.

Case #2: ATD Exposure

- ▶ Hospital A reported the case to the local health department. They may have notified the ambulance company, but no reports were provided to the police or fire departments.
- ▶ **A police officer and a respiratory therapist developed bacterial meningitis and were hospitalized in ICU**
- ▶ Cal/OSHA found that employees of all three responders at the scene (ambulance service, police and fire departments) had been exposed.

BBP and ATD: What's the Difference?

BBP	ATD
Specific, identifiable activities lead to occupational exposures	Many people potentially exposed to disease agents in air or droplets
Bloodborne diseases are often silent; undetected disease is common	Often infected individuals have cough or other obvious signs
Three named infections, which may cause chronic and serious illness	A variety of diseases are commonly spread through this route

Cal/OSHA ATD Standard

Coverage:

Healthcare and other higher risk settings for person-to-person transmission

- ▶ Full Standard Employers
- ▶ Referring Employers
- ▶ Conditionally Exempt Employers

Cal/OSHA ATD Standard

Exposure Control Plan/Infection Control Procedures:

- ▶ Written plan that addresses procedures for controlling exposures to ATD hazards
- ▶ Identifies person responsible for maintaining and implementing the plan
- ▶ Reviewed at least annually and updated as needed
- ▶ **Non-management employees must have opportunity for input on plan**

ATD Pathways

- ▶ Direct contact with or proximity to patient (“source”)
- ▶ Shared air space, e.g., in the same room
- ▶ Ventilation systems
- ▶ Hand contact with mucous membranes
- ▶ Fomites (from surfaces, materials)

Goal is to interrupt the pathway of disease transmission

Cal/OSHA ATD Standard

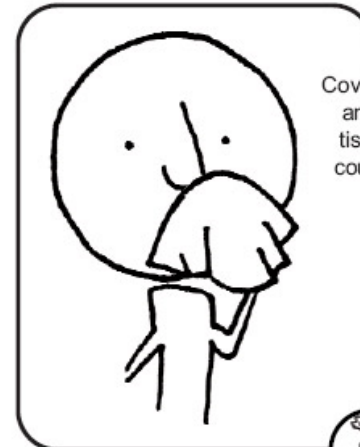
Control Measures:

Source control

- ▶ Respiratory hygiene/cough etiquette
- ▶ Hand hygiene

Stop the spread of germs that make you and others sick!

Cover your Cough



Cover your mouth and nose with a tissue when you cough or sneeze or



cough or sneeze into your upper sleeve, not your hands.

Put your used tissue in the waste basket.



You may be asked to put on a surgical mask to protect others.

Clean your Hands

after coughing or sneezing.



Wash hands with soap and warm water for 20 seconds or

clean with alcohol-based hand cleaner.



Respiratory Hygiene/Cough Etiquette

- ▶ Education of staff, patients, and visitors
- ▶ Posted signs
- ▶ Covering mouth/nose with tissues, surgical masks
- ▶ Hand hygiene after contact with respiratory secretions
- ▶ Spatial separation (>3 feet) in common areas

Cal/OSHA ATD Standard

Control Measures:

Engineering controls

- ▶ Patient placement
- ▶ Ventilation systems
- ▶ Closing doors and other openings
- ▶ Isolation of infectious patients (i.e., airborne infection isolation rooms and booths)
- ▶ Lab hoods and biosafety cabinets

Cal/OSHA ATD Standard



Referring Employers must:

- ▶ Have a written protocol for early identification of patients with symptoms or signs of TB or other airborne infectious diseases
- ▶ Procedures for transferring infectious patients to a facility with adequate administrative and environmental controls, generally within 5 hours of identification

PPE



Cal/OSHA ATD Standard

Referrals must be provided if the patient:

- ▶ Has a cough for more than three weeks that is not explained by non-infectious conditions.
- ▶ Exhibits signs and symptoms of a flu-like illness during March through October, the months outside of the typical period for seasonal influenza, or exhibit these signs and symptoms for a period longer than two weeks at any time during the year.
- ▶ States that they have a transmissible respiratory disease, excluding the common cold and seasonal influenza.
- ▶ State that they have been exposed to an infectious ATD case, other than seasonal influenza.

Cal/OSHA ATD Standard

Control Measures:

Work practice controls

- ▶ Cleaning and disinfection of work areas, vehicles, and equipment
- ▶ Disposal of contaminated materials/equipment
- ▶ Avoid creation of aerosols; apply cleaning solutions to cloth not to surface directly

Cal/OSHA ATD Standard



EBOLA PERSONAL PROTECTIVE EQUIPMENT (PPE)

Powered Air Purifying Respirator (PAPR) and hood

Surgical hair cover

Nitrile gloves (TWO PAIRS)

Impervious coverall (OVER SCRUBS, UNDER GOWN)

Impervious gown

Impervious leg/shoe covers

UC DAVIS
MEDICAL CENTER

The diagram shows a person in a full-body white protective suit with a hood and clear face shield. Labels with lines pointing to the equipment include: Powered Air Purifying Respirator (PAPR) and hood, Surgical hair cover, Nitrile gloves (TWO PAIRS), Impervious coverall (OVER SCRUBS, UNDER GOWN), Impervious gown, and Impervious leg/shoe covers. A small inset photo shows a person in a yellow protective suit. The UC Davis Medical Center logo is in the bottom right corner.

True or False?

A surgical mask will protect a person from contracting airborne diseases.

Surgical Masks are NOT Respirators!



Surgical Mask



N95 Respirator

Cal/OSHA ATD Standard

Personal Protective Equipment:

- ▶ Respirators
- ▶ Gloves
- ▶ Eye/face protection
- ▶ Gowns or coveralls

Respirators



Requirements for Respirator Use

- ▶ Employers must:
 - ▶ Select an appropriate respirator
 - ▶ Provide a confidential medical evaluation before you are fit-tested for or use a respirator
 - ▶ Provide a fit-test at least every year
 - ▶ Have a written respirator program, and a respirator program administrator
 - ▶ Train you on the purpose of the respirator and the respiratory hazards, how to use the respirator, the capabilities and limitations of the respirator, and what to do in an emergency

Cal/OSHA ATD Standard

Preventive Medical Services:

- ▶ Vaccinations for annual flu, mumps, measles, rubella, varicella (chicken pox), and Tdap (tetanus, diphtheria and acellular pertussis)
 - ▶ Vaccinations must be provided as employer expense
 - ▶ Employees may decline vaccination
- ▶ TB surveillance

Cal/OSHA ATD Standard

Post-Exposure Procedures:

- ▶ Report cases of certain ATDs to local health officials (LHO)
- ▶ Conduct investigation of exposure scenarios within timeframe reasonable for specific disease and no longer than 72 hours after report to LHO
 - ▶ **Investigation must include all potentially exposed employees**
 - ▶ Investigation should include whether other employers may have had employees who had contact with case (e.g., ambulance, paramedics, EMTs, referring physician's office or clinic)

Cal/OSHA ATD Standard

Post-Exposure Procedures:

- ▶ Notify all employees with significant exposure and refer to medical provider knowledgeable about the specific disease
- ▶ Prophylaxis and treatment, when appropriate
- ▶ Precautionary removal

Sick Employees

- ▶ Encourage employees to report symptoms of fever, cough, sore throat, diarrhea to supervisor or infection control personnel
- ▶ Sick time policies should not penalize employees for using sick time when necessary
- ▶ Ensure proper staffing levels so employees don't feel pressure to work when ill

Cal/OSHA ATD Standard

Employee Training:

- ▶ Initial and annual training for employees with potential occupational exposures
- ▶ Must include site-specific ATD hazards and control measures in the workplace, proper use of PPE, cover all aspects of the exposure control plan
- ▶ **Must provide opportunities for interactive questions and answers**

Cal/OSHA ATD Resources

Cal/OSHA ATD Standard

<http://www.dir.ca.gov/title8/5199.HTML>

ATD Tools and Resources

<https://archive.cdph.ca.gov/programs/ohb/Pages/ATDStd.aspx>

True or False?

I learned something valuable today that I can bring back to my workplace.



Thank you!

Kevin Riley, PhD MPH

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