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# OSHA Bloodborne Pathogens and Infection Control Made Easy for Dentistry

Version 131 A

For 2013 training in conjunction with  
© CTP workbook and on-line test.



# Abbreviations

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- CDC – Centers for Disease Control and Prevention
- DHCP – Dental Health Care Personnel
- EPA – Environmental Protection Agency
- FDA- Food and Drug Administration
- HBV – Hepatitis B Virus
- IC – Infection Control
- ICC/ICRF – Infection Control Committee/ Review Function
- OPIM– Other Potentially Infectious Materials
- MTF – Medical Treatment Facility
- PPE – Personal Protective Equipment

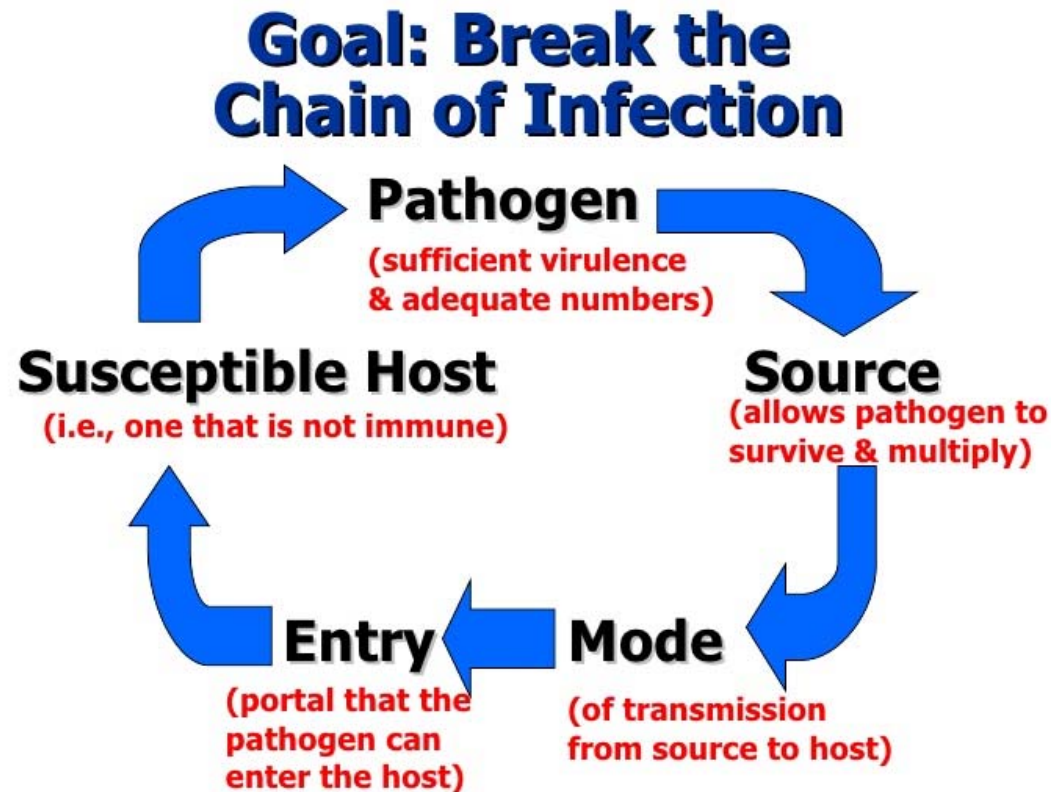


# Why is Infection Control Important

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To make sure we protect both  
the healthcare worker and the  
patient from disease

# What is the goal?

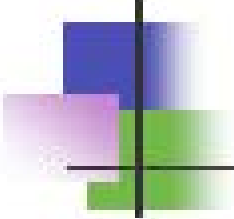




# Standard Precautions

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- Use the same infection control procedures for all patients
- Assume all patients are infectious
- Infection control policies are determined by the procedure, not from our view of the patient



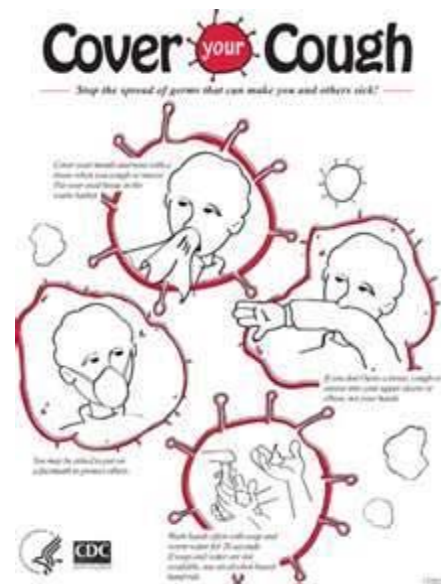
# What are the Essentials for Standard Precautions?

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- Hand washing
- The proper use of PPE
- Cleaning and disinfecting environmental surfaces
- Using both engineering and work practice controls
- Respiratory hygiene and cough etiquette
- Following proper sterilization policies and procedures

# Respiratory Hygiene and Cough Etiquette

Coughing and sneezing into your mask, elbow, or a tissue will help eliminate the spread of airborne pathogens into the environment around you



# Immunizations

- Recommended to reduce the potential for disease transmission to both healthcare worker and patient
- The following are recommended by the CDC
  - Varicella
  - Measles
  - Mumps
  - Rubella
  - Influenza
  - Hepatitis B







# Work Restrictions

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Policies should encourage personnel to seek care and report their illnesses;

<b>Diseases</b>	<b>Work restrictions</b>
Conjunctivitis	Until no discharge
Diarrheal disease	Until symptoms stop
Measles	About one week
Pertussis	5 days after antibiotics
Strep Group A	24 hrs after antibiotics
Varicella	Until lesions crust
Viral respiratory illness	Until symptoms stop
Shingles/zoster	Cover lesions

# Preventing Transmission of Bloodborne Pathogens

- Standard Precautions
- Engineering Controls
- Work Practice Controls
- Postexposure management, and Prophylaxis





# Routes of Transmission

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Patient → DHCP

DHCP → Patient

Patient → Patient

# Hepatitis B Vaccination Requirements

- Must make available, free of charge to all employees at risk of exposure within 10 working days of initial assignment unless:
  - employee has had the vaccination
  - antibody testing reveals immunity
- The vaccination must be performed by a licensed healthcare professional.



# Engineering Controls

- **Controls that isolate or remove the bloodborne pathogens hazard from the workplace**
- **Commonly used in combination with work practice controls and PPE to prevent exposure**



# Work Practice Controls

This is behavioral based. Changing the way one works to have a safer outcome and altering the manner in which a task is performed will reduce the risk to the employee



# Occupational Exposure Incidents

Occupational exposure incidents may include parenteral injuries such as needlesticks as well as splashes to mucous membranes (inside of eyes, nose, or mouth) and non-intact (cut, scraped) skin





# Postexposure Wound Care

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- Clean wound with soap and water
- Flush mucous membranes with water
- There is no evidence of benefit for:
  - Applying antiseptics or disinfectant
  - Squeezing puncture sites
  - Using of bleach and other caustic agents





# Postexposure Report

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- Date and time of the incident
- Procedure details, to include, what, where and how
- Exposure details including body substance involved, volume, and duration of contact
- Information about the source person
- Information about the exposed person
- Exposure management details





# Postexposure Management

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- Immediate evaluation and follow-up completed by a qualified health-care professional
- After each incident review the circumstances surrounding the injury and the post exposure plan
- Provide training to implement preventative changes as needed

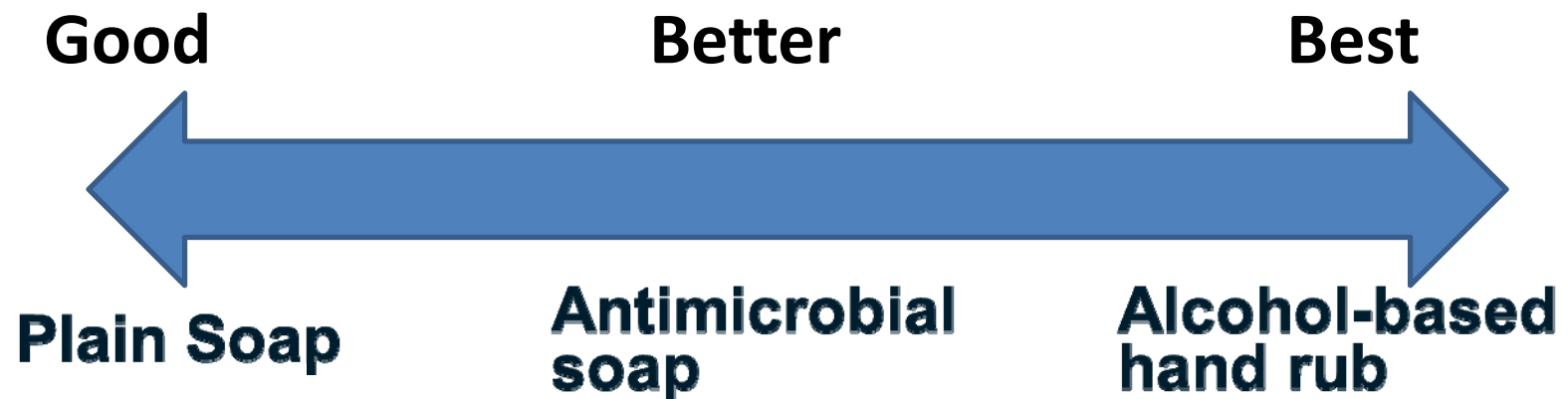
# Hand Hygiene

- The most important means of preventing disease transmission



# Efficacy of Hand Hygiene Preparations in Reduction of Bacteria

Source: <http://www.cdc.gov/handhygiene/materials.htm>



# Hand Hygiene Techniques

- Before a surgical surgery procedure:
  - Using antimicrobial soap , scrub hands and forearms for length of time recommended by the manufacture (about 2-6 minutes)



# Skin Care



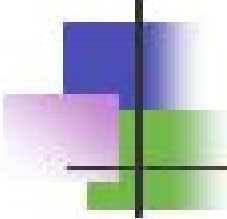
- Use approved hand lotions or creams
- Check with the manufacture for compatibility
  - Some lotions prematurely break down the latex gloves
  - Lotions can become contaminated with bacteria if dispensers are not properly cleaned and dried



# Lend a helping hand

- Keep your fingernails short with smooth edges to aid in proper cleaning and disinfecting
- Artificial nails are NOT recommended
- Do not wear rings or other hand jewelry that would compromise the fit and integrity of the glove





# “PPE” Personal Protective Equipment

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- “ PPE is appropriate if it does not allow fluids to pass through and to undergarments or skin”
- PPE is dictated by the exposure risk, not by the patient
- Employers must provide and maintain the PPE needed for employee safety





# Donning and Removing PPE

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## **Proper order for Removing/Donning PPE**

- 1<sup>st</sup> Wash hands
- 2<sup>nd</sup> Protective eyewear or face shield (handling only by the headband or earpieces)
- 3<sup>rd</sup> Gown or protective apparel (pulling the gown or jacket away from the neck and shoulders and handling only the inside of the garment)
- 4<sup>th</sup> Surgical face mask, grasping the bottom then the top ties or elastics
- 5<sup>th</sup> Put on gloves
- 6<sup>th</sup> Always wash hands after removing PPE

# Face Mask



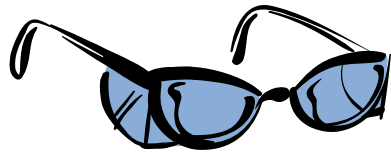
- What is the function of a face mask?
- How often should you replace your mask?
- What does the BFE rate mean?
- What are other benefits of a good mask?
- What is the proper way to don your mask?



# Safety eyewear

What is wrong with this picture?





# Eyewear



- Each day, about 2,000 U.S. workers sustain job-related eye injuries
- Approximately 60 percent of workers sustaining eye injuries were not wearing proper protective eyewear
- An estimated 90 percent of eye injuries could be prevented through the use of protective eyewear



# Protective Clothing

- Wear long-sleeved reusable or disposable gowns, clinical jacket, or lab coats to protect skin of the forearms and clothing likely to be soiled with blood, saliva, or OPIM
- Change your PPE immediately if visibly soiled
- PPE is required whenever splash-splatter or spray is anticipated.





# Gloves

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Gloves should be worn whenever hand contact with blood or other potentially infectious materials is likely to occur. Since saliva is considered a potentially infectious material, this means gloves will be used in almost all patient procedures. Gloves also should be worn when touching contaminated items or surfaces.

- Don't reuse single use, disposable gloves
- Replace gloves if they become torn or punctured or their ability to function as a barrier is compromised
- Use utility gloves for clean-up activities
- Sterile surgical gloves for surgical procedures

# Laundry

- Your PPE must be removed before leaving the work area
- Should be handled as little as possible
- Contaminated clothing must be placed in a fluid resistant bag that has the biohazard label on it
- Cleaned by a professional service or cleaned in-house
- **Must not** be taken home



# Sterilization Update

**Instrument processing area should separate the four main areas of activity:**

- 1. Receiving, cleaning, and decontamination**
- 2. Preparation and packaging**
- 3. Sterilization**
- 4. Storage**





# Why Consider Holding Solutions

A holding solution is a liquid solution used to soak contaminated instruments before they are cleaned and sterilized. Its purpose is to:

- Decrease number of microbes on instruments which cannot be cleaned and sterilized immediately
- Loosen and minimize debris before scrubbing or ultrasonic cleaning
- Minimize the physical handling of instruments



# Cleaning Instruments

- Transport dirty instruments in a closed container such as a cassette
- Wear nitrile utility glove for handling instruments and decontaminating procedures
- Use protective eyewear



# Ultrasonic Cleaners

- Place instruments into a perforated or wire mesh basket
- Never place items directly on the bottom of tanks
- Always close the lid or cover on the unit when in use to decrease aerosols and avoid splattering of the solution onto adjacent surfaces
- Follow manufacturer's instructions for exact cleaning times for different models



# Instrument Washer



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# Prep and Package

- Make sure all instruments are clean
- Rinse and let drain
- Only use FDA approved packaging
- Wrap or place in packages to maintain sterility during storage
- Use an internal and external chemical indicator on all packages





# Sterilization Monitoring

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Chemical indicators which are used in heat sterilizers only indicate that a specific temperature has been reached

Physical indicators include: pressure gauges, indicator lights, buzzers, timers. While helpful, they do not prove sterility

Biological monitors (Spore tests) are designed to prove sterility. **Heat sterilizers should be tested weekly.**

# External/Internal Chemical Indicators



# Instrument Processing

- DO NOT handle package while they are wet
- Verify that the indicators have changed colors
- Rotate usage of your instruments and check for compromised packaging.





# Adequate Autoclave Capacity

Make sure you have adequate sterilization capacity and a back up!





# Sterilization

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## Steam Autoclave

- Do not overload or stack packages to prevent circulation and penetration of steam
- Stand pouches on edge with paper up
- If you are using cassettes, use a rack
- Required maintenance is a **MUST**
- Do not interrupt a sterilization cycle
- Requires appropriate drying time

# Biological Monitoring



# Environmental Surface Infection Control

- **Clinical Contact Surfaces** may include light handles, switches, x-ray equipment, chair side computers, drawer handles, faucet handles, countertops, pens, telephones and doorknobs (eliminate touching as many of these surfaces as possible!)
- **Housekeeping Surfaces** include floors, walls and sinks



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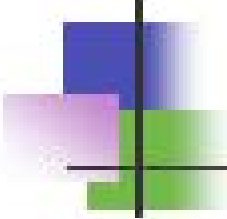


# Environmental Surface Disinfection

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“The bottom line is that operatory surfaces must be cleaned and disinfected between patients. Use of a surface spray or wipe is acceptable and effective provided you use the proper method of cleaning - clean/wipe/clean - and carefully follow the instructions for use. Unfortunately, it takes time to clean and disinfect properly”.

Andrew G. Whitehead  
VP Crosstex International



# Environmental Surface Disinfection “Touch Surfaces”

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“Usually contacted and contaminated by staff during a dental procedure. Examples of touch surfaces include the X-ray exposure button, dental chair switches, headrest, and the air-water syringe. These surfaces require either between-patient cleaning/disinfection or protection with an impervious, single-use barrier”.

Andrew G. Whitehead  
VP Crosstex International

# Environmental Surface Disinfection

## “Transfer Surfaces”

“Are not touched directly by the dental worker, but usually are contacted by contaminated instruments. Examples of transfer surfaces include instrument trays and bracket tables. For optimal asepsis, these surfaces should be maintained in the same manner as touch surfaces”.

Andrew G. Whitehead  
VP Crosstex International



# Environmental Surface Disinfection “Splash-Spatter” and “Aerosol Surfaces”

“Comprised of all surfaces in the operator room not classified as touch or transfer surfaces. Examples include the X-ray view box and any unused countertop areas. Splash and spatter surfaces need not be disinfected, but should be cleaned at least daily”.

Andrew G. Whitehead  
VP Crosstex International





# Barrier Covers

- Where do you use barrier covers?
- Are they changed after each patient?



Full body cover



Hooded cover



Hand free cover



Hand free cover



# Regulated Waste

Must be placed in closeable, leak-proof containers built to contain all contents during handling, storing, transporting or shipping and be appropriately labeled or color-coded.

Every state is different when it come to regulated waste disposal. Please know what your state requires of you!



# Biohazard Warning Labels

Warning labels required on:

- \*Containers of regulated waste
- \*Waste containers in each operatory
- \*Refrigerators and freezers containing blood or other potentially infectious materials





# Regulated Waste in your Office

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List items that may be Regulated Waste in your facility by category:

- Absorbent material (anything capable of absorbing liquid, like gauze & cotton products)
- Non-absorbent material (anything that will not absorb liquid, like gloves, barrier covers)
- Sharps (anything that is contaminated that can puncture or lacerate the tissue)



# Dental Unit Water Quality

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- Potable water:
  - **Less than 500 colony forming units (CFU's) per ml. of water**
- Dental unit water can be 10,000 CFU or more!
- Why? Dental unit design is ideal for growth!
- The American Dental Association statement and its challenge to industry:
  - Develop methods to control biofilms in dental unit water systems
  - Bacteria levels to not exceed 200 CFU/ml



# Sources of Dental Unit Water Line Contamination

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- **Source water.** This is not universally controlled. Some areas will have higher CFU/ml than other areas
- **Retracted oral fluids.** All new dental units have anti-retraction valves built in, but they can wear out. Many older units have no anti-retraction valves
- **Biofilms.** These will always form in dental unit waterlines-- it's the nature of the beast



# Conditions That Facilitate Biofilm Formation In The D.U.W.L

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- Microbes are continually enter the line/tubing
- Nutrients are continually being supplied via the incoming water
- Stagnation of water in the tubing facilitates accumulation/growth
- The waters natural flow rate is low near the tubing walls
- The tubes small diameter creates a large surface-to-volume-ratio—perfect for growth!



# Measures to Improve Water Quality

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- Independent reservoirs
  - Isolates unit from municipal supply
  - Allows for waterline treatment products
  - Allows offices to practice during times that municipal water supply is under a “boil water notice”
- Water purification cartridge systems
- Sterile water delivery systems
- Filtrations
- Combination of methods



# Water Test Kit

It is important to test the quality of the water coming from your dental unit. With an increased number of patients with compromised immune systems, keeping your bacteria count low is extremely important



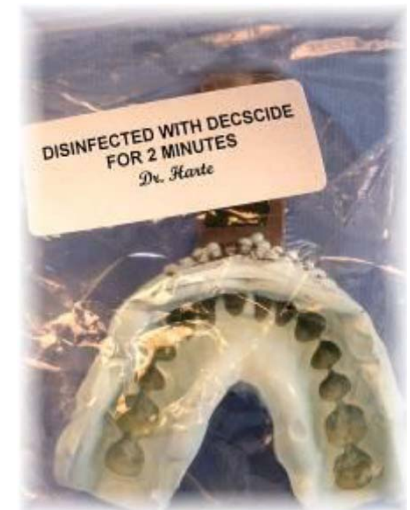
# Surgical Irrigation



- Sterile saline or water should be used as a coolant/irrigant in the performance of oral surgical procedures
- Delivery devices such as sterile bulb syringes or single-use sterile waterlines should be used to deliver water

# Dental Laboratory

- Practice Standard Precautions
- Clean and disinfect all laboratory items before entering the dental lab using an intermediate level disinfectant
- Communicate cleaning and disinfection procedures
- Make sure safety devices/engineering controls are in place





# Disinfect Impressions

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## Methods:

- Spraying, dipping, immersing
- It is recommended to use the longest exposure/contact time on the label
- Iodophors, sodium hypochlorite (1:10 concentration), chlorine dioxide, phenols, and other approved intermediate level disinfectants are all acceptable

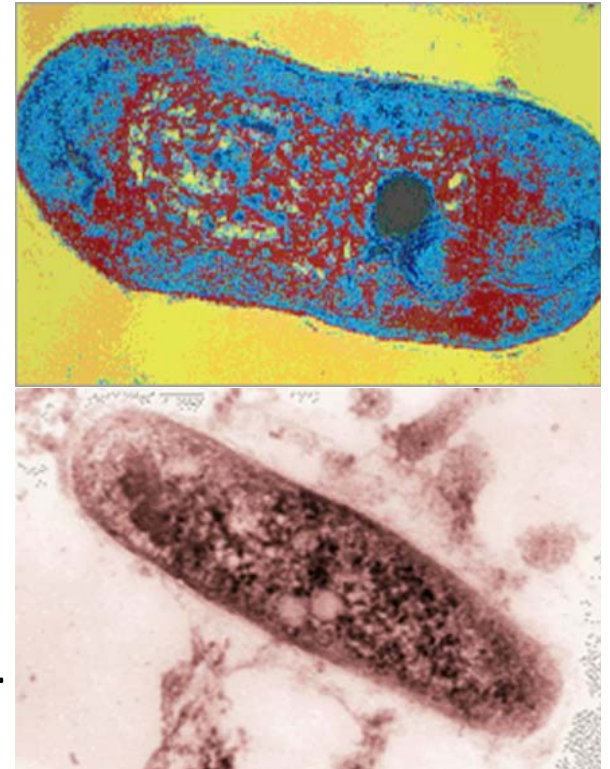
# Laser Safety

- Wear appropriate PPE
- Wear protective laser eyewear
- Implement proper evacuation/exhaust controls
- Make sure the area the laser is used in is labeled properly



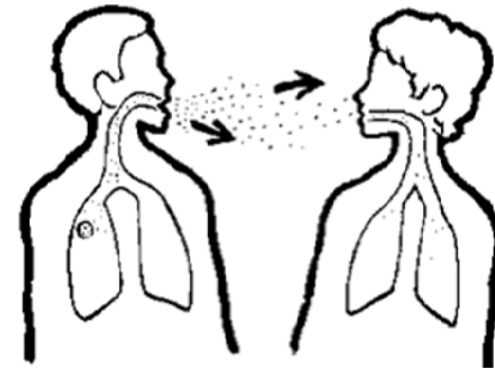
# Tuberculosis

- Bacterial infection
- Caused by *Mycobacterium tuberculosis*  
(also called *tubercle bacillus*)
- Is either latent (non-infectious) or active (infectious)
- Can be fatal if not treated properly
- Foreign-born people have a rate 10 times greater than US-born



# Transmission of Tuberculosis

- TB spreads through the air when a person
  - Coughs
  - Speaks
  - Laughs
  - Sneezes



- Transmission occurs when another person breathes in the bacteria (called droplet nuclei) and becomes infected
- In most people, the immune response kills the bacteria
- In some people the bacteria remain viable for years. This is called “**latent TB infection.**” These people are not infectious. About 10 % of these people develop “**active infection**” and they are infectious



# Symptoms and Diagnosis

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- The most common symptoms and signs of TB are fatigue, fever, weight loss, coughing, and night sweats
- The diagnosis of TB involves skin tests, chest X-rays, sputum analysis (smear and culture), and PCR tests which determines the genetic make-up of the causative bacteria





# TB Risk Categories

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- In a **low risk facility**, patients with TB are unlikely to be seen. **Most dental offices are considered low risk**
- A **medium risk facility** is likely to see patients with TB
- A **potential for ongoing transmission** facility has evidence of ongoing person-person transmission of TB

# TB Testing of Employees



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- Baseline testing is recommended for all risk categories
- Low risk facilities only need a baseline test. **This includes most dental offices. No further testing needed**
- Medium risk facilities also need annual testing
- Potential ongoing transmission facility employees must be tested every 8-10 weeks until evidence of transmission has ceased
- Positive tests will require further evaluation



# Epidemiology and Pathogens

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**Epidemiology** is the study of the patterns, causes, and effects of health and disease conditions in defined populations.

**Bloodborne Pathogens** are microorganisms carried in the blood that are able to cause disease in humans

Common Bloodborne Pathogens are:

Hepatitis B (HBV)

Hepatitis C (HCV)

Human Immunodeficiency Virus (HIV)

# Hepatitis B Virus (HBV, HepB)

- Viral liver disease causing severe liver damage, liver cancer, & potential death
- Incidence in US is dropping due to vaccination program
- Chronic infection: 1.25 million chronically infected Americans
- 30% infected individuals show no symptoms
- For those who do show symptoms, the onset is generally between 5-6 months:
  - Jaundice  
(skin, eyes become yellow)
  - Dark urine
  - Abdominal pain





# How to Prevent Hepatitis B Infections in your office

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- Get vaccinated!
  - OSHA's Bloodborne Pathogens Standard requires that employees with potential exposure be offered the vaccine at no cost
  - Occupational infections have decreased 95% since the Hep B vaccine became available in 1982
- Use Standard Precautions (treat everyone as if they were infected)
- Personal Protective Equipment (PPE)
- Housekeeping/disinfection important
- Engineering controls (mechanical devices)
- Work practice controls (workplace behaviors)



# Hepatitis C Virus (HCV, HepC)

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- Hepatitis C infection is the most common chronic bloodborne infection in the U.S.
- Approximately 3.2 million people in the U.S. population, are infected with hepatitis C.
- Of those infected with Hepatitis C:
  - 85% will remain infected for life; of those:
    - 60 - 70% will develop chronic liver disease
    - 10 – 20% will develop cirrhosis (scarring of the liver)
    - 1 – 5% will develop liver cancer
- Slow onset of symptoms (greater than 6 months) which include:
  - Jaundice (skin, eyes become yellow)
  - Dark Urine
  - Abdominal pain
  - Flu-like symptoms





# How To Prevent Hepatitis C Infections At Work

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- Standard precautions
  - **NO VACCINE AVAILABLE**
  - Treatment difficult – no post-exposure treatment generally given
- Housekeeping/disinfection important because the virus may be able to survive on hard surfaces for some time
- Personal Protective Equipment (PPE)
- Engineering controls (mechanical devices)
- Work practice controls (workplace behaviors)



# HIV in the United States

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- 1.2 million people are living with [HIV](#) in the United States of America, with a fifth unaware of their status
- Last year - 47,129 people were diagnosed with HIV infection in the 46 states which report diagnoses





# HIV

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- Attacks the immune system
- Destroys white blood cells
- Leaves patient immune suppressed
- A retrovirus—constantly changing
- Many people show no symptoms for years
- Eventually leads to the development of AIDS (acquired immune deficiency syndrome)
- Early signs and symptoms very similar to flu: fever, fatigue, enlarged lymph nodes, headache

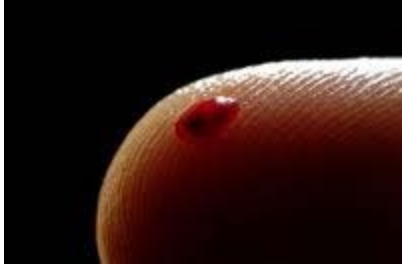
# How to Prevent HIV Infection at Work

- Engineering controls (engineered devices)
- Work practice controls (behavior based)
- Use of Personal Protective Equipment
- Standard precautions
- In the picture below, 1 of the 11 people has HIV.
- Can you pick the one with HIV ?

This is why we treat everyone as though they have HIV!



# Average Risk of Transmission after Percutaneous Exposure to Blood

<u>Source</u>		<u>Risk (%)</u>
HIV		0.3
Hepatitis C		1.8
Hepatitis B		30.0



# Exposure Control Plan

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- A written plan that identifies jobs and tasks where occupational exposure to blood or other potentially infectious materials occurs
- **Required for OSHA compliance**
- Describes how the employer will:
  - Use engineering and work practice controls
  - Assure use of personal protective equipment
  - Provide training
  - Provide medical surveillance (post-exposure)
  - Provide hepatitis B vaccinations
  - Use signs and labels for prevention



# Exposure Control Plan

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- **A written plan is required and** must be reviewed at least annually to reflect changes in:
  - tasks, procedures, or assignments which affect exposure, and technology that will eliminate or reduce exposure
- An annual review must document the employer's consideration and implementation of "**safer medical devices**"
- Must solicit input from potentially exposed employees in the identification, evaluation and selection of engineering and work practice controls
- This plan must be accessible to employees



# Question and Answer

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If you have any questions that cannot be answered today, please contact the Compliance Training Partners Technical Services Department at

**1-888-388-HPTC(4782)**



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