

Occupational exposure to bloodborne pathogens

Dr. Sadeghniaat

Professor of Tehran University of Medical Sciences
Director of Iranian Occupational Medicine Association
Head of Imam Khomeini complex hospital

OCCUPATIONAL HAZARDS

CHEMICAL
PHYSICAL
ERGONOMIC
PSYCHOLOGIC
BIOLOGIC

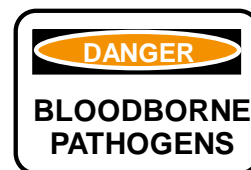
FACTORS AFFECTING CLINICAL RESPONSE TO exposures

- Duration of exposure
- Frequency of exposure
- Route of exposure
- Environmental Factors
- Individual Factors

BLOODBORNE HAZARDS

COMMON BLOODBORNE DISEASES:

- MALARIA
- HEPATITIS C
- HEPATITIS B VIRUS (HBV)
- HUMAN IMMUNODEFICIENCY VIRUS (HIV)



EXPOSURE DETERMINATION

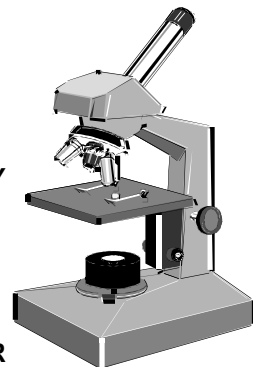
Job classifications that may be at risk for occupational exposure include:

- School nurses
- Teachers and instructional aides
- Bus drivers
- Coaches and assistants
- First aid providers
- Custodians
- Medical Students

BLOODBORNE HAZARDS

HEPATITIS B VIRUS (HBV):

- ONE OF THE MOST COMMON VIRUSES
- VACCINES AVAILABLE TO PREVENT INFECTION
- CAN CAUSE DAMAGE TO LIVER LEADING TO DEATH
- VIRUS CAN BE SPREAD TO FAMILY MEMBERS EASILY
- SEVERE FLU-LIKE SYMPTOMS ARE A COMMON SYMPTOM
- BLOOD, SALIVA AND OTHER BODY FLUIDS MAY BE INFECTIOUS
- SYMPTOMS MAY BE DELAYED 28 TO 160 DAYS AFTER EXPOSURE



BLOODBORNE HAZARDS

HUMAN IMMUNODEFICIENCY VIRUS (HIV):

- ☑ NO KNOWN VACCINE FOR HIV
- ☑ DIFFICULT TO CONTRACT IN THE WORKPLACE
- ☑ VIRUS IS *NOT* SPREAD THROUGH CASUAL CONTACT
- ☑ SYMPTOMS MAY BE DELAYED FOR MONTHS TO YEARS
- ☑ DECREASES THE BODY'S ABILITY TO FIGHT INFECTION
- ☑ BLOOD AND OTHER BODY FLUIDS MAY BE INFECTIOUS
- ☑ SEVERE FLU-LIKE SYMPTOMS ARE A COMMON SYMPTOM
- ☑ LEADS TO ACQUIRED IMMUNE DEFICIENCY SYNDROME (AIDS)

TRANSMISSION MODES

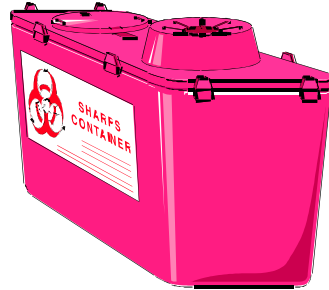
BBP'S CAN BY TRANSMITTED BY:

- ☑ BLOOD
- ☑ VOMIT
- ☑ BODY FLUIDS
- ☑ NOSE AND MOUTH
- ☑ MUCOUS MEMBRANES
- ☑ ABSORPTION THROUGH THE EYES
- ☑ CUTS, SCRAPES, BURNS, RASHES, DERMATITIS ETC.

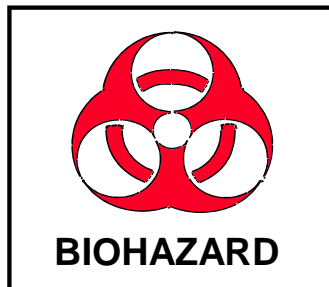
TRANSMISSION MODES

OCCUPATIONAL EXPOSURE CAN OCCUR:

- ☑ CPR
- ☑ REMOVAL OF SUTURES
- ☑ BLOOD SUGAR SCREENING
- ☑ BIOHAZARD SPILL CLEANUP
- ☑ TREATING TEARS OF SKIN TISSUE
- ☑ DISPOSAL OF CONTAMINATED SHARPS
- ☑ CHANGING CONTAMINATED DRESSINGS
- ☑ JANITORIAL DUTIES IN FEMALE REST ROOMS
- ☑ REMOVAL OF FOREIGN BODIES FROM EYES OR SKIN



COMMUNICATION OF HAZARDS



INTERNATIONAL SYMBOL FOR BIOHAZARD

COMMUNICATION OF HAZARDS

WARNINGS AND LABELS:

- LABELS MUST BE **FLUORESCENT** ORANGE OR ORANGE-RED
- WARNING LABELS MUST BE AFFIXED TO **WASTE CONTAINERS**
- LABELS MUST BE ***PROPERLY*** AFFIXED TO CONTAINERS
- RED BAGS OR CONTAINERS MAY BE USED IN LIEU OF LABELS
- DECONTAMINATED WASTE NEED NOT BE LABELED OR CODED
- LABELS ARE ONLY REQUIRED ON THE OUTSIDE PACKAGE

COMMUNICATION OF HAZARDS

SIGNAGE:

- SIGNS MUST BE POSTED AT THE ENTRANCE TO WORK AREAS HAVING POTENTIALLY INFECTIOUS MATERIALS



BIOHAZARD

1. ***NAME OF THE INFECTIOUS AGENT***
2. ***SPECIAL REQUIREMENTS FOR ENTRY***
3. ***NAME, TELEPHONE NUMBER OF THE RESPONSIBLE PERSON***

PPE REQUIREMENTS

PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS:

- ☑ FOLLOW LOCAL JOB PROCEDURES
- ☑ IF YOU THINK ADDITIONAL PPE IS NEEDED, REQUEST IT
- ☑ DON'T AUTOMATICALLY ASSUME YOU'RE COVERED
- ☑ IF YOU HAVE QUESTIONS CONSULT YOUR SUPERVISOR
- ☑ UNDERSTAND WHAT YOU'RE DEALING WITH!



PPE REQUIREMENTS

PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS:

- ☑ REMOVE PPE BEFORE LEAVING THE WORK AREA
- ☑ KNOW BIOHAZARD WARNINGS AND LABELS
- ☑ PLACE USED PPE IN DESIGNATED CONTAINERS
- ☑ NEVER TRY AND DECONTAMINATE DISPOSABLE PPE
- ☑ KNOW THE TYPE OF PPE REQUIRED FOR THE JOB!



GENERAL CONCEPTS OF TOXICOLOGY

ROUTES OF ENTRY

INHALATION

-- A DOSE THAT IS ABSORBED THROUGH THE LUNGS INTO THE BLOODSTREAM

ABSORPTION

-- A DOSE THAT IS ABSORBED THROUGH THE SKIN OR EYES

GENERAL CONCEPTS OF TOXICOLOGY

ROUTES OF ENTRY

INGESTION

-- A DOSE THAT IS ABSORBED THROUGH THE GASTRO-INTESTINAL TRACT FROM EATING, DRINKING OR SMOKING

INJECTION

-- A DOSE THAT IS ABSORBED VIA BROKEN GLASS, SPRAY GUNS, NEEDLES, COMPRESSED AIR, KNIVES ETC.

GENERAL CONCEPTS OF TOXICOLOGY

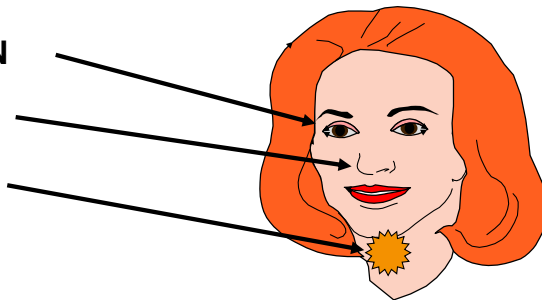
EXPOSURE TERMINOLOGY

- ☑ **LOCAL EFFECT.** DAMAGE TO BODY PARTS THAT ACTUALLY CONTACT THE HARMFUL SUBSTANCE (ACID ON A HAND).
- ☑ **SYSTEMIC EFFECT.** DAMAGE TO AN AREA OF THE BODY AFTER THE SUBSTANCE IS ABSORBED (LIVER DAMAGE).
- ☑ **INDIVIDUAL SUSCEPTIBILITY.** SOME PEOPLE ARE NATURALLY SENSITIVE OR CAN DEVELOP SENSITIVITY TO A SUBSTANCE.
- ☑ **DOSE.** COMBINATION OF CONCENTRATION AND LENGTH OF BODILY EXPOSURE TO A SPECIFIC MATERIAL.

METHODS OF CONTROL

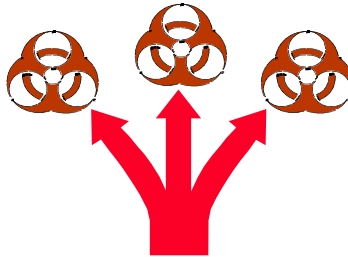
ROUTES OF ENTRY

- ☑ ABSORPTION
- ☑ INGESTION
- ☑ INJECTION



METHODS OF CONTROL

CONTROL THE SPREAD OF CONTAMINATION



METHODS OF CONTROL

COMMON SENSE RULES:

- ☑ WASH HANDS AND REMOVE PPE BEFORE:
 - ✓ EATING
 - ✓ SMOKING
 - ✓ DRINKING
 - ✓ HANDLING CONTACT LENSES
 - ✓ APPLYING COSMETICS OR LIP BALM

METHODS OF CONTROL

UNIVERSAL PRECAUTIONS:

- ☑ PROTECT ALL POTENTIAL ROUTES OF ENTRY
- ☑ PROPERLY DECONTAMINATE ALL POTENTIALLY EXPOSED PPE
- ☑ NEVER REUSE DISPOSABLE GLOVES (CROSS CONTAMINATION)
- ☑ ASSUME ALL HUMAN BLOOD AND BODY FLUIDS ARE INFECTIOUS
- ☑ INSPECT PERSONAL PROTECTIVE EQUIPMENT (PPE) BEFORE USE

METHODS OF CONTROL

ACCIDENT/SPILL CLEANUP RECOMMENDATIONS:

- ☑ PUT ON A LEAK-PROOF APRON
- ☑ USE EYE AND FACE PROTECTION
- ☑ RESTRICT ACCESS TO THE CONTAMINATED AREA
- ☑ WEAR TWO PAIRS OF GLOVES TO PREVENT EXPOSURE
- ☑ USE DISPOSABLE TOWELS TO SOAK UP FLUIDS OR BLOOD
- ☑ DISINFECT MOPS AND OTHER CLEANUP EQUIPMENT AFTER USE
- ☑ USE EYE PROTECTION (SPLASH GOGGLES) TO PREVENT EXPOSURE

EXPOSURE INCIDENT REPORTING

SUGGESTED REPORTING METHOD:

- ☑ DON'T PANIC!
- ☑ DECONTAMINATE THE EXPOSED BODY PART
- ☑ REPORT TO YOUR SUPERVISOR
- ☑ DETERMINE THE SOURCE OF THE EXPOSURE
- ☑ TRY TO OBTAIN A SAMPLE FOR ANALYSIS
- ☑ ASK ABOUT VACCINATION, FOLLOW-UP ETC.

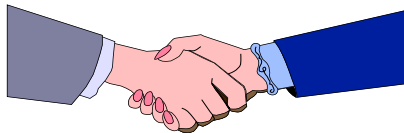
MANAGING INFECTIOUS WASTE

STORAGE:

- ☑ ESTABLISH DESIGNATED STORAGE AREAS
- ☑ CONTROL ACCESS TO STORAGE AREAS
- ☑ USE APPROVED RECEPTACLES
- ☑ RED IS THE PRIMARY COLOR FOR CONTAINERS
- ☑ ENSURE LABELS ARE PRESENT
- ☑ ENSURE PACKAGING IS SUFFICIENT
(I.E. DON'T USE BAGS FOR SHARPS ETC.)

OSHA'S PERCEPTION OF A SUCCESSFUL PROGRAM

1. DETAILED EXPOSURE CONTROL PROCEDURES
2. EXTENSIVE EMPLOYEE TRAINING PROGRAMS
3. PERIODIC REINFORCEMENT OF TRAINING
4. SUFFICIENT DISCIPLINE REGARDING IMPLEMENTATION



Methods to Reduce Exposure

- Engineering controls
- Personal protective equipment
- Work practice controls
 - Universal precautions
 - Handwashing
 - Housekeeping guidelines
 - Laundry handling

Control of Exposure

- **Engineering Controls**
 - Isolate or remove the blood-borne pathogens from the work place, i.e., sharps disposal, auto-injection devices
- **Work Practice Controls**
 - Reduces likelihood of exposure by altering manner in which task is performed
- **Universal Precautions**
 - Assumes all persons might be infectious, and includes use of personal protective equipment and environmental practices

Work Practice Controls

- Universal Precautions
- Handwashing technique and facilities
- Guidelines for handling body fluids in school
- Proper sharps use and disposal
- Rules for personal hygiene and eating in workplace

PREVENTION (HCP-HLPP)

- INITIAL AND ANNUAL AUDITS
- EXPOSURE ASSESSMENT
- ENGINEERING&ADMINISTRATIVE CONTROLS
- SELECTION & USE OF *HPD*
- WORKER EDUCATION
- RECORDKEEPING
- PROGRAM EVALUATION

Requirements of Law

- Exposure Control Plan
- Staff Education
 - Blood-borne Diseases
 - Universal Precautions
 - Use of Personal Protective Equipment
- Vaccination Program
- Exposure Incident Follow-up
- Record Keeping