### EMPLOYEE SAFETY TRAINING presented by DUHS Occupational & Environmental Safety Office (OESO)

### Divisions

- Environmental Programs
- Radiation Safety
- Biological Safety
- Ergonomics
- Fire Safety
- Occupational Hygiene and Safety







### 6 FUNCTIONS OF THE ENVIRONMENT OF CARE (EOC)







### **Bloodborne Pathogens**

Syphilis	HTLV-I	Lassa Fever
Malaria	Hepatitis B	Other
	Hepatitis C	Hepatitis
Leptospirosis	HIV	Leprosy
Marburg Fever		Borreliosis
rypanosomiasis	Ebola Fever	Colorado Tick Fever

Т

# Risk of Infection from a Needlestick





Hepatitis C 1 / 200

HIV

1 / 300



### Occupationally-acquired Hepatitis Infections Duke University Hospital Employees



The hepatitis B vaccine has virtually eliminated hepatitis B occupational infections at Duke Hospital. Since post-exposure testing for hepatitis C antibody was initiated in 1996, 3 occupational infections with hepatitis C have been identified, highlighting the need to use precautions against blood exposure, including the use of the new safer sharps devices.

### **Universal (Standard) Precautions**

<u>ALL</u> blood and body fluids are considered potentially infectious and must be handled with basic (standard) precautions

# Safety Devices Found Throughout DUHS



Push-button, safety catheter IV stylet



Shielded safety "butterfly" needle



Shielded phlebotomy needle



Blood transfer device for syringe blood draws





# **Use Precautions**

1	-
1	At
N'	10
E AJ	Y
	~

# Use EXTREME precautions with needles and sharps

Wear gloves anytime contact with blood is anticipated





### Faces can be protected with the mask / shield combination, goggles, or a full faceshield

## **Biohazard Labels**

Label all equipment used for storage or transport of blood or body fluids with a biohazard symbol (red sticker in photo on right)





Sharps •pipettes •glassware •sharps Used needles should be placed directly into sharps containers WITHOUT recapping or breaking needles



# **Blood or Body Fluid Spills**

- Wear gloves
- Absorb fluids with disposable towels
- Clean area with soap/water
- Decontaminate with appropriate disinfectant (ex., diluted bleach, "tuberculocidal" disinfectant)

- Place all disposable material into an appropriate bag for disposal



# "Bulk" blood and body fluids

- -blood bags
- -suction liners
- ->20 mls fluid



### **Laboratory Infectious Waste**



# Needlestick? Cut? Splash to Face?.....

Duke Hospital or Medical Center Employees:

Employee Exposure Hotline: 115

Off-site Employees:

684-8115



### **Standard Work Practices**

### NO eating or drinking in patient care areas

### **Tuberculosis**

How can I catch TB at work?

- By breathing in aerosols of TB bacteria
- Patients who are coughing/sneezing or undergoing cough-inducing procedures (bronchoscopy)



## What Causes TB?

- Mycobacterium tuberculosis
  - Causes TB
  - Occupational Risk



- Mycobacteria other than TB (MOTT)
  - Causes disease in immunocompromised, ex., MAI in AIDS patients
  - NOT an Occupational Risk

### **TB can exist as two conditions:**

### Latent TB:

Infection with TB bacteria, BUT NO symptoms

Active TB (infectious): Infection with TB bacteria AND HAS symptoms

## Signs and Symptoms of Active TB

Anorexia Fatigue Weight Loss Fever Night Sweats Cough Hemoptysis **CXR** Changes

## How do we protect ourselves at DUHS?

- Rapid Identification and Isolation
- Designated Patient Isolation Room (door sign shown in next slide)
- Employee Respiratory Protection
- Routine PPD Skin Tests and Follow-Up

# **AIRBORNE ISOLATION**



#### •Visitors must report to nursing station before entering room.

Los visitantes deben reportarse ante la estación de enfermería antes de entrar.

#### •Wash hands before entering and after leaving room.

Lávese las manos antes de entrar y después de salir del cuarto.

### •Must wear *N*-95 *Respirator* (must be fit tested to wear) or *PAPR* to enter patient's room.

Se requiere mascarilla tipo N-95 (necesita medírsela para el tamaño correcto) o protección respiratoria del PAPR para entrar.

### •Please enter through anteroom. Keep room entrance door closed at all times.

Entre por la antesala, por favor. Mantenga cerrada la puerta de entrada al cuarto en todo momento.

#### •Dietary may not enter.

No puede entrar el personel que sirve comidas.

#### •Follow Standard Precautions.

Tome Precauciones Normales.

Questions? Call Infection Control at 684-5457 ¿Preguntas? Llame al Centro de Control de Infecciones al 684-5457



### N95 Respirators for TB Fit testing required



### Not fitted with an N95 respirator?

PAPRs: Powered Air Purifying Respirators

No fit-testing, but training on proper use is needed



SafetyTech FlexAir PAPRs

# How Do I Know If I've Been Infected?

### PPD Skin Testing:



- When hired
- Periodically for "high risk" groups
- After exposures to TB, and no precautions were used



# **Ionizing Radiation**

-Occurs in nature -Also produced and used frequently in a medical center setting -Great benefits for disease diagnosis and treatment, but some risks associated with too much exposure:

- birth defects
- cancer

It is possible to work SAFELY with ionizing radiation.





Time

•spend the <u>minimum</u> amount of time in close proximity to the radioactive source (materials, patient) as possible

## **Protective Factors**

Distance

•maintain the <u>maximum</u> practical distance from the radioactive source



# Personal Protective Equipment (PPE)



Shoe covers



Gloves



Lab coat



Lead apron www.safety.duke.edu

# **Radiation Signs**

•special precautions in effect

•check before entering room

•do not remove or disrupt anything in the room (coverings, etc.)

> •Ex: radionuclide patients may have radioactive body fluids



### **Radioactive Waste**

•do NOT dispose of radioactive waste in regular trash

sensors exist around
Duke and at dumps
to detect radiation



## **Dosimetry Badges**

radiation badges are
issued by the Radiation
Safety Division

•monitors your amount of radiation exposure

•do NOT wear someone else's badge



## **Radiation Exposure and Pregnancy**

•exposure to the fetus must be minimized

•contact EOHW for a confidential Declaration of Pregnancy

•your exposure to hazardous materials, including radiation, will be assessed



# Wear appropriate eye protection if in a room where a laser is in use



### **Chemicals are Everywhere!**



Offices/classrooms







### Environmental

### Services



Laboratories



### Maintenance

In order to work safety with chemicals, which are found in most every work environment here, Duke follows regulations provided by OSHA.
# OSHA Hazard Communication Standard Your "Right to Know"



## Labels

- Include identity of Chemical as it Appears on MSDS
- Include appropriate
   Hazard Warnings
  - Physical Hazards
  - Health Hazards
  - Specific Target
     Organ Effects



# Material Safety Data Sheets (MSDS)



# The Key to Hazard Communication

Can be found on OESO website and on DUHS Intranet

# **Chemical Hazards**

#### **Physical Hazards Health Hazards**

- Flammable
- Compressed Gas
- Reactive
  - Cryogen
  - Oxidizer
- Corrosive



- Carcinogens
- Toxic Agents
- Reproductive Agents
- Irritants







# Routes of Chemical Entry into the Body



# **Health Effects**

# ACUTE

- Effects show up right away (example: eye irritation)
- Result of short term, high level exposures



## **Health Effects**



#### CHRONIC

- Usually take a long time to develop
- Result of repeated
   exposures



# **Chemical Disposal**

 Waste Disposal – info in MSDS

Team

 Chemical spills, leaks or releases – call Spill Response



# Container Management Policy

- **Purpose:** To prevent containers with contents inconsistent with the container's label from reaching the patient; and inappropriate reuse of containers that previously contained product used in the process of patient care.
- Verify contents of the container (product name, strength, expiration date (as applicable))
- Verify container integrity (unbroken seal)
- Read supplemental label information
- Sequester compromised containers (i.e, seal is broken, label is defaced)
- Following disposal/re-use protocol



# **Equipment Management**



- Equipment Inspection
  - Done by Clinical Engineering
  - Inspection stickers on equipment with due date of next inspection
  - Remove any equipment that appears broken/uninspected



#### Utility Systems

- Emergency power is supplied by backup generators via red outlets
- Plug essential equipment into these
   outlets
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# Ergonomics: the science of matching the job and the product to the user.



#### **Before**

After

# **Benefits of Ergonomics**

- Increase worker comfort
- Increase productivity
   and job satisfaction
- Prevent development of musculoskeletal disorders (MSD)



# Musculoskeletal Disorders (MSDs)

- Happen over time
- Take a long time to heal
- Can be quite painful
- Can result in difficulty performing daily activities
- Reduce our effectiveness and efficiency



# Signs and Symptoms of MSDs

- Pain or inflammation at the end of the day
- Numbness or tingling in the fingers, leg or foot
- Pain that wakes you up in the middle of the night
- Loss of function
- Swelling



## **Ergonomic Stressors**

### Repetitive Motion





#### Awkward Postures

## **Ergonomic Stressors**



#### **Excessive Force**



Vibration

### **Ergonomic Stressors**



#### Cold



#### **Contact Stress**

# Physical Conditions and Personal Activities that can Contribute to an MSD

- Smoking
- Obesity
- Sedentary Lifestyles
- Hobbies and Home Activities
- Part-time Jobs
- Age
- Hormonal Disorders or Changes
- Medical Conditions





# **Reducing Your Risk for an MSD**

- Change your work procedures or environment
- Use more comfortable equipment/modify equipment
- Increase your awareness of MSDs, signs and symptoms
- Identify risk factors in your work area
- Take frequent "micro-breaks" to stretch or rest



# What should you do if you have an MSD?

- Seek medical treatment at the first sign of an MSD
- If it is work-related, complete an Accident/Injury Report and contact Employee Health
- Otherwise, contact your primary care physician

Duke Ergonomics Program 668-ERGO



# **Fire/Life Safety**



If a fire broke out in your area, would you know what to do?

Do you know your evacuation procedures?

What can you do to prevent a fire in your workplace?

# The Requirements for a Fire are:

### 1. Oxygen –

which is why you shut windows in the case of a fire or why you can smother a fire on a stove with a lid



# **Fire Requires:**

#### 2. A Fuel Source –

such as empty boxes, which also pose tripping hazards during evacuation...

and never store flammables within 18" of the ceiling!





# **Fire Requires:**

#### 3. An Ignition Source –

which can come from a spark from a frayed electrical cord, cooking, an overheated coffee pot or cigarettes



# **Fire Requires:**

# 4. A chemical reaction –

Remove any one of these requirements and the fire will be extinguished



#### Know your Evacuation Routes

 – know at least two ways out which do not involve elevator use



#### **Practice Fire Drills**

planning and
 practicing drills can
 save lives



#### Know the location of the fire equipment

- know where your fire extinguishers and pull alarm stations are



#### Know your Interim Life Safety Measures –

exits and equipment location may change while an area is under construction, so Interim Life Safety Measures will be implemented



#### **Be Prepared !** Know your fire alarm:

- •CODE RED
- •Duke Hospital uses a 4-digit code system
  - •This code alerts staff where the fire is
  - Know the fire code for your work area; can be found in your sitespecific fire plan



#### IN CASE OF FIRE

Remove all persons in danger
 Activate manual alarmidial 911
 Close all doors anifor windows
 Exclusion fire

#### ELECTRICAL SAFETY \* RED motions provide alternative

- Prover during emergencies
  Frayed conita-take out of service
- Electrical shorts/fires-disconnect the plag
- Oxygen increases ignition and spand of fire
  - · Signs should be used to indicate
  - meygen use & storage locarion
     Une caution in or around usyges unliched atmospheres.
  - In case of fire in patient room, shut off room anygen if possible
  - . The Charge Nurse or Respiratory
  - Therapist is responsible for shorting off coppen zone valves.

#### My Life Safety System Numbers are: Bidg Flowr Fire Disits Zens 0-9

- MEDICAL CENTER EMERGENCIES



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8/03

#### **Know your**

designated
 meeting place if
 evacuation is
 required



# In the event of a fire:

#### Follow the RACE procedure

#### R – Remove all persons



#### **A** – Activate the alarm, call 911





## **C** – Close all doors and windows



#### E – Extinguish the fire



# Use a fire extinguisher when:

- the fire is contained and not spreading
- •the extinguisher is readily available
- •you know how to use it properly
- personal safety is not compromised
- •there is a clear path for escape
# Use the acronym PASS to remember how to use a fire extinguisher



#### P = Pull the Pin

#### **A** = *Aim at the base of the fire*



#### S = Squeeze the handle



#### S = Sweep from side to side



Report all fire-related incidents, regardless of size or severity, to:

- Duke Police

Report fire safety hazards to OESO Fire Safety (684-5609)

Remember

Pull the Pin, Call it In - 911











#### Hospital Incident Command System (HICS) – Duke's emergency plan









# Incident Commander (IC)

 provides overall direction for all hospital operations during a disaster

•supported by four section chiefs

•becomes the point person for the response effort



# Logistics

 supplies the necessary resources (equipment, supplies, medicine)

- maintains the hospital's physical environment (utilities)
- logistics staff wear yellow vests during HICS activation





# Planning

 gathers information to develop a strategic plan to manage the long-term operations of the hospital and the recovery process

- organizes staffing and bed availability
- planning staff wear blue vests during HICS activation



## Operations

- provides medical treatment for existing patients as well as medical treatment for those patients admitted as a result of the emergency
- operations staff wear red vests during HICS activation



#### Finance

- handles cost analysis
- lends financial support by providing the accounting functions necessary during an emergency response
- finance staff wear green
  vests during HICS activation



# **Emergency Codes**

- **Emergency Management Plan** 
  - Activation
  - Standby
- Hazardous Materials Medical Emergency Fire Alarm Missing Infant/Child Security Alert Utility/Communication System Failure ED Critical Saturation Severe Weather

Code Triage Code Triage Standby Code Orange Code Blue Code Blue Code Red Code Pink Code Gray

#### Code Black Code Purple National Weather Service Announcements

### **Departmental Sub-Plans**



After activation of a code, departmental sub-plans are implemented. Sub-plans include:

phone trees for contacting staff

•communication pathways necessary during a disaster

duties of departmental staff

Become familiar with your sub-plan

# Example - Code Pink - Missing Infant/Child

Sequence of events:

- Call 911 to notify of missing infant/child
  - include child's name, description, where last seen
- Initiate search of your area
- Monitor exits

"Code Pink – Infant (or Child), M/F, Age, Location"

# Example - Code Pink - Missing Infant/Child

**Staff response:** 

- Be alert for suspicious behavior, children matching the description

- Call 911 immediately if something noticed
- Do not put yourself at risk by confronting a potential abductor
- Follow area-specific procedures



## General Emergency Procedures

- Aid in the continuation of care
- Keep emergency response areas clear of non-essential personnel
- Wear your ID badge







In order for this system to work appropriately and efficiently, we must continue to develop the departmental sub-plans and practice the implementation of these sub-plans through drills. Duke's ability to efficiently respond to a disaster requires a unified response from all the staff, utilizing the HICS structure.

# Occupational & Environmental Safety Office

www.safety.duke.edu

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