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Hand Injury Prevention

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Course Elements

- Hand Hazards / Potential Injuries
- Hand Hazard Controls
- Proper Gloves for the job
- Proper Tools for the job

How important are your hands?

- The hand is one of the most complex parts of your body – the movement of the tendons, bones, tissues and nerves allows you to grip and do a wide variety of complex jobs
- Without your hands it would be extremely difficult to do routine simple tasks, such as opening doors, using a fork, or tying your shoes
- Your hands make you a skilled, valuable worker
- The improper use or misuse of hand tools cause minor to serious hand injuries
- Hand injuries are likely when the wrong tool is used or the right tool is used improperly

How important are your hands?

- What could you NOT do if you lost a finger, thumb or hand today?
- What are the consequences associated with a hand injury?

Did you know

- That your hands and fingers have more nerve endings per square centimeter than any other part of your body.
- That your hands and fingers also have more pain receptors than any other part of your body.
- That your hands & wrists contain 27 bones.

At-Risk Behaviors that Contribute to Hand Injuries

- Failure to pay attention to the task at hand
- Failure to keep one’s eyes on task
- Failure to keep body parts out of the line of fire
- Failure to maintain cutting blades (dullness) necessitating additional force
- Failure to wear PPE
- Failure to use the proper tool
- Failure to use the correct type of chemical resistant glove
- Failure of the hands to listen to the brain

At-Risk Behaviors that Contribute to Hand Injuries

- Using the wrong tool for the job
- Using a cutter as a screwdriver
- Hammering a cutter through thick material
- Modifying tools to defeat safety devices
- Cutting in awkward positions
- Cutting on unstable surfaces
- Allowing cutters to become slippery due to oil based chemicals
- Cutting towards oneself

Hand Hazard Controls

Training : Provide adequate training to the workers ;

- Pre-Job safety Analysis (JSA)
- Active Job Inspections
- Constant Hand Awareness
- Work permit procedures

Effective Lockout/Tag out

Engineering Controls

- Tag Lines
- Tool holders
- Correct Tools
- Pinch Point Bars

Wear adequate PPE

Hand Placement Awareness

- Hand placement is so crucial because injuries can happen when individuals least expect them.
- PPE will not always prevent injuries from happening.
- Recognize the hazard, ask “What If” and a prevent / protect against the “What If”.

Hand Injuries

- Hand injuries can be associated with working with machinery or equipment
- The materials being used or the job process might be hazardous
- Hand tools or powered hand tools may be faulty or improperly used

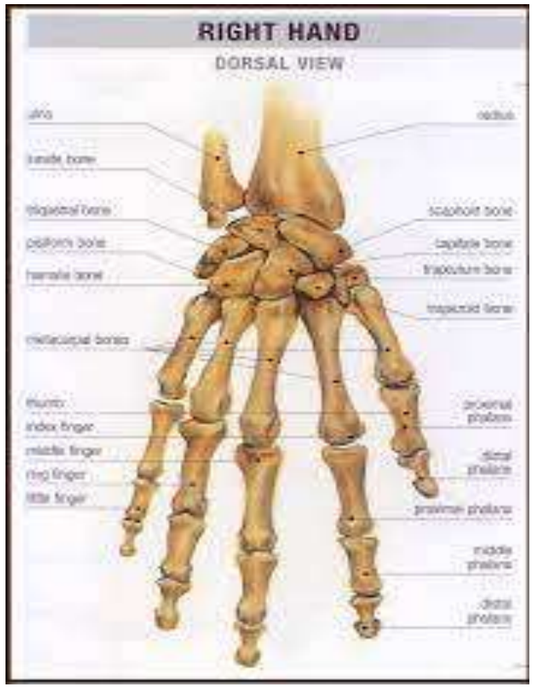
Hand Injuries causes

The most common causes of hand injuries are:

- Carelessness
- Lack of awareness
- Boredom
- Disregard for safety procedures
- Distractions

Hand Injuries

- Hand injuries are difficult to repair because of the complexity of the hand
- After a hand injury, the hand may not function as it did before the injury due to loss of:
- Motion
- Dexterity
- Grip
- Ability to complete the simplest of tasks



Hand Injuries prevention

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- To avoid hand injuries:
- Know the hazards and dangers in the job to be done
- Be aware of pinch points
- Be aware of hot areas
- Be aware of rotating or moving surfaces
- Automated machinery may be controlled by remote control, or delayed timing devices that cause the machine to start automatically
- Loose clothing and jewelry may be caught up in moving machinery
- Never remove machine safeguards or operate machinery with safeguards removed

Lines of Defense

- Awareness of Hazards and Prevention Measures
- Personal Protective Equipment (PPE)
- Good housekeeping

Hand Hazards

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Hand Hazards

Bee stings

Chemicals

Punctures

Blood-borne pathogen

Insect bites

Rotating equipment

Extreme temperatures

Pinch points

Cuts

Vibrating equipment

Screwdrivers

- When using screwdrivers, place the object on a flat surface or in a vice Don’t hold it in your hand!
- Don’t use screwdrivers as chisels or pry bars
- Use the correct size driver for the screw
- Don’t use screwdrivers with chipped tips

Knives

- Use safety knives whenever possible
- Keep knife blades sharp
- Cut away from your body
- Do not use knife blades as screwdrivers
- Avoid working on the same object when a coworker is using a knife

Hammers

- Never use a hammer with a splintered, cracked, or loose handle
- Don’t use hammers with rounded striking faces
- Use the correct hammer for the job
- Don’t strike a hammer face with another hammer
- Don’t use nail hammer claws as a pry bar

Hand Saws

- Use moderate pressure on hack saws to prevent blade failure
- Spray saw blades lightly with lubricant prior to use
- Keep blades sharp

Chisels

- When possible use a safety chisel
- Don’t use chisels with mushroomed heads
- Use the correct chisel for the job
- Don’t use chisels as pry bars

Wrenches

- Use the correct sized wrench for the job
- Don’t use pliers with worn grooves or crescent wrenches with worn or sprung jaws
- Don’t use pliers or crescent wrenches on over tight bolts and nuts
- Pull on wrenches rather than pushing them
- Never use a cheater bar on a wrench
- Never use as a hammer
- Always pull on a wrench – never push

Portable Power Tools

- Disconnect power tools when not in use and before changing bits, blades, a other accessories
- If a power tool binds STOP! and reassess the job
- Wear anti-vibration gloves when using power tools that vibrate excessively
- Never remove guards!
- Never remove handles!
- Ground power tools unless double insulated
- Don’t wear gloves if they can get caught on rotating parts
- Secure work in a vice or on a bench - Don’t hold it in your hand!

Shop Tools

- Use a push stick to cut small pieces
- Unplug or Lockout tools before changing blades
- Keep tools sharp
- Never remove guards
- Use a drill press vise when drilling – Don’t hold parts with your hands!

Bench Grinders

- Don’t wear gloves when operating bench grinders
- Never remove guards!
- Maintain proper clearances on tool rests and tongue guards
- Use vice grips when grinding small parts

Maintain tongue guard within ¼” of the wheel

Maintain tool rest within 1/8” of the wheel

Extreme Temperatures

- Use tongs or high temperature
- gloves to handle hot or cold
- parts and equipment

Bites and Stings

- Use caution when moving debris piles or equipment which has been sitting for a long time
- Don’t stick your hands in holes, crevasses and other secluded places, including work boots which have been sitting for awhile
- Avoid areas where insects nest or congregate (garbage cans, stagnant pools of water, uncovered foods and areas where flowers are blooming)
- Avoid dressing in clothing with bright colors
- Don't use scented soaps, perfumes or hair sprays

Equipment Handling

- Use tag lines
- Wear leather gloves
- Never place your hand on top of the load or between the load and a fixed object
- Inspect hooks and chain slings before use
- Never hang load from the hook tip, unless it is designed for that

Jewelry

- Remove jewelry before using power tools or working on machines
- Jewelry can be watches, rings, bracelets, or any other item used to decorate a person’s body
- Keep sleeves buttoned

PPE - Many Gloves for Different Applications

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Natural Rubber

Polyvinyl Alcohol (PVC)

Nitrile

Neoprene

Polyvinyl Chloride (PVC)

Cotton

Wire mesh

Kevlar

Welding

Leather

Anti-vibration

Which Glove is Best?

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Glove	Uses
Cotton	Light duty material handling and cleanup work
Leather	Equipment handling, general construction, heavy cleanup, welding, moderately hot or cold material handling
Shock absorbing	Operating rotary hammers and other vibrating equipment
Kevlar or Wire mesh	Work with sheet metal, glass, or heavy cutting These gloves Do Not provide puncture protection
Rubber, nitrile, neoprene, PVC, PVA and other synthetics	Chemical gloves must be chosen for the specific chemical being used
Insulated	Extreme high and low temperatures

General Guidelines for Chemical Resistant Glove Materials

Glove material	Generally resistant to:
Viton	Chlorinated and aromatic solvents
Butyl rubber	Aldehydes, ketones, and esters
Neoprene	Solvents, acids, caustics, and alcohols
Natural rubber (Latex)	Acids and caustics
Polyvinyl chloride	Acids, but not solvents

How Chemicals Get In!

- Permeation : Diffusion of a chemical through a material on a molecular basis
- Penetration : Chemical enters through zippers, punctures, or seams
- Degradation : Chemical causes a change in the physical properties of the material

Glove Care

- Inspect gloves before use for tears, excessive wear, and punctures
- Store in a clean, dry location
- Discard leather and cloth gloves if they become saturated with oil or other chemicals
- Leak test chemical gloves by sealing the wrist and filling the glove with air
- Use a clean plastic tube or low pressure air line – not your mouth!

Hand Care

- Avoid washing your hands with solvents, harsh soaps, or abrasives
- Clean and bandage all cuts and abrasions
- Immediately remove any imbedded foreign materials
- Wash immediately after using any chemical – Even if you did not detect leakage
- Pay attention to skin rashes—get an immediate medical evaluation
- Wear cotton gloves under rubber gloves to reduce sweating

Types of Injuries

1-Lacerations & Fractures

Cuts, fractures, punctures and amputations:

- Cuts or lacerations – May sever nerves, tendons or muscle or become infected
- Fractures can damage nearby tissue and be difficult to repair

Types of Injuries

2- Dermatitis

Dermatitis and burns are caused by direct contact with chemicals, detergents, metals, or very hot or cold objects:

- Dermatitis may show up immediately after contact with a chemical causing the skin to become red, swollen, itchy, or burning, and may develop blisters
- Dermatitis may develop after several contacts with chemicals known as sensitizers - Nothing happens initially, later contacts with the chemical produce an allergic reaction

Types of Injuries

3- Carpal tunnel syndrome

- Results from prolonged repetitive work with the hands. This condition can be disabling and can have a variety of temporary symptoms like swelling, tingling, numbness, and pain in the hands or fingers

Hand Exercises

- Doing a few simple exercises before work and between tasks will build ha strength and provide a rest from repetitive motions
- Exercises:
- Stretch fingers by spreading them wide apart for a few seconds (Repeat 3 times with each hand)
- Stretch your thumb by holding it down gently for five seconds (Repeat 3 times with each hand)
- Stretch your wrist by making circles with your hands (Repeat 10 times for each hand)

Cutting Operations & Tool Guidelines

Proper Tool	Proper Use
Dykes	Cutting Rope, Wire, & Tie-Wraps
Martor Knife	Opening / Disposing of Boxes
Scissors	Cutting Shrink Wrap, String, Banding (Plastic)
Shears	Cutting Banding (Metal)
Flush Cuts	Cutting Excess Tie-Wrap
Wire Cutters	Cutting Wire
Wire Strippers	Stripping Wire
Metal Snips	Cutting Sheet Metal
Stripping Coax	Coax Stripper (AKA Coring Tool)
Cable Cutter	Cutting Cable
Insulated Cutters	For Hot Work

Hand Injury Prevention Success

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Pre-Task Planning:

- Understand the task steps.
- Choose the correct Tool for the task.
- Choose the correct PPE for the task.
- Adhere to safe work Behaviors while performing the task.
- Do not give into complacency - it is safety's worst enemy.
- Maintain your vigilance and ensure a good supervision.