SAFE WORK PRACTICES

ERGONOMICS AND MUSCULOSKELETAL DISORDERS

Musculoskeletal disorders (MSD's) are injuries of the muscles, nerves, tendons, ligaments, joints, cartilage or spinal discs. MSD's do not include injuries that are the direct result of a fall, vehicle collision etc.

Symptoms of an MSD

- Pain
- Swelling, inflammation
- Numbness or tingling sensation
- Decreased movement of a joint
- Stiffness of body part
- Symptoms worsen with time

Some recognized risk factors are:

1. Forceful Exertion - lifting, pushing, pulling, and gripping tools exert force or muscle effort.
2. Repetitive Movements - performed repeatedly. Painting, nailing, grinding are examples.
3. Awkward Postures - postures in which joints are held or moved away from the body's natural position. Examples include stooping, bending, kneeling, and reaching.
4. Secondary Risk factors
    a. *Contact Pressure* - which is any external pressure applied to soft tissues. Holding tools that press into parts of the hand is an example.
    b. *Vibration* - can cause damage to nerves and blood vessels and other soft tissues.

Controls

Engineering Controls - are preferred measures to physically modify the forcefulness, repetitiveness, awkwardness, or vibration levels of a job.

Administrative Controls - are management directed work practices to reduce or prevent exposure to risk factors. They include changes in job rules like more rest breaks or job rotation.

What can you do to reduce or prevent MSD's?

- Use carts, dollies, chains, or cranes to carry materials
- Break loads into smaller units
- Exercise and stretch before starting work
- Get another person to help
- Work on materials at waist height
- Take mini rest and stretch breaks
- Use handles on tools that are more comfortable
- Use tools that are low torque, low kickback and lightweight
- Don't sit in the same position too long. Take a break and change positions.

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Whole Body Vibration

Heavy equipment operators are exposed to vibration from all types of heavy equipment. The 3 main sources of WBV are:

- low frequency vibration caused by tires and terrain.
- high frequency vibration from the engine and transmission.
- shock from running into potholes or obstacles.

Sort term exposure to WBV can include abdominal and chest pain, headaches, nausea, and loss of balance. Long term exposure can cause serious health problems related to the spine and gastrointestinal system.

Workers must be made be aware of the following to reduce WBV:

- Maintain the suspension system and correct tire pressure. This will help reduce WBV.
- Maintain a seat with hydraulic and air shock absorbers.

Manual Material Handling

General

- Do not rush.
- Use gloves if there is a risk of laceration or puncture.
- Never handle material if using/ascending/descending a ladder.
- Never put your fingers/hands into pinch points or create a potential pinch point when lifting heavy material manually.
- Before lifting consider if there is a tool/equipment/safer workflow that could be done instead

Safe Lifting Practices

- Try and keep neutral posture throughout the lift.
- If possible, use equipment or an assistive device – like a dolly or pump truck – to help move the load.
- Before lifting get as close to the load as possible.
- Brace with your core and lift the load with your legs. Try and keep the back out of it as much as possible.
- Use your feet to pivot and turn, do not twist your back.
- Lower the load slowly, try and keep the back in a neutral position.
- Try and keep the load balanced between both sides of the body when possible.
- When lifting objects such as lumber or pipe try and balance the load on your shoulder.

External Factors

- Extra care must be given during adverse weather conditions and extreme heat and cold.

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Specific Controls

Hand Tools

- Choose tools with vibration reducing features.
- Choose tools that are lighter and reduce hand torque and kickback.
- Make sure tools are balanced and do not require extra muscular effort.
- Choose tools with triggers that allow for multiple fingers.
- Inspect and maintain tools regularly. Replace old worn tools.

Pushing and Pulling

- Make sure handles on carts are adjustable to allow for different worker heights.
- Use larger wheels on carts to reduce push or pull forces.
- Design work to avoid having to push or pull material up slopes or in crowded spaces.
- Push rather than pull carts.

Heavy, Frequent and Awkward Lifting

- Use mechanical aids to lift, lower objects/material.
- Keep loads close to the body.
- Split large loads into smaller loads.
- Plan lifting activities include clearing paths of obstacles and paying attention to good housekeeping.

Fixed or Awkward Postures

- Adjust height of adjustable workstations.
- Use anti-fatigue matting.
- Place materials at suitable heights and bring closer to the actual work activity area to avoid long reaches.
- When working in cramped positions, allow time to stretch and change position.
- If possible, use devices for overhead work.

Repetition

- Implement job rotation.
- Increase the variety of activities.
- Include flexibility and encourage taking micro-breaks.

Contact Stress

- Change or modify equipment.
- Use PPE (i.e., knee pads, padded gloves).
- Change or modify work practice or workspace to reduce contact with sharp or hard edges, surfaces.

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Cold Temperatures

- Ensure workers wear appropriate outdoor clothing including well-fitting, insulated gloves.
- Store tools in warm area if possible while not using.
- Provide breaks in warm areas.
- Provide portable heating if practical.
- Encourage workers to stay hydrated.

Warm Temperatures

- Rotate workers to allow for cooling breaks.
- Encourage workers to stay hydrated.

Work Organization and Work Methods

- Allow rest/recovery from demanding/repetitive tasks.
- Provide work variability.
- Ensure work pace and demands are appropriate.
- Provide training on MSDs, hazards, and controls.

Ergonomics for the Office Environment

Ergonomics can be defined as fitting the job to the worker. All workers are not the same size, and everyone has different tolerances and limits. Ergonomics is applied to the design of workstations, work processes, equipment, and tools to fit the worker to minimize risk factors that may lead to musculoskeletal injury.

Proper Workplace and Workstation Design

A properly designed workplace helps the worker maintain good body posture and minimizes forces on the body. The workstation is recommended to be appropriate for the job and fit the worker's body size and shape.

Standing at Work

Generally, the work surface is best at elbow height with the work placed in front of the worker so there is no need to twist or reach. Use of a footrail or footrest allows the worker to shift some of their body weight and rest muscles and joints. Anti-fatigue mats may provide cushioning for hard floors.

Sitting at Work

Chairs, desk, computer, or a workbench all affect the worker's body position. The chair is recommended to be adjustable so that feet rest comfortably on the floor or on a footrest. Arrange workstation to allow proper back support. (I.e. position keyboard or monitor closer to user). Arm rests are recommended to be adjusted to support the forearms and prevent hunching.

"Ideal" Sitting Posture for Computer Work:

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- *Wrists*: Naturally straight position; not bent up, down, or from side to side.
- *Elbows*: Bent between 90° and 100° (right angle), close to your body and supported if possible.
- *Shoulders*: Relaxed (not slouched or raised).
- *Neck*: Facing forward and not looking up, down, or to either side.
- *Hips*: Bent around 90° with your thighs roughly parallel to the floor.
- *Low Back*: Supported to maintain its natural curve.
- *Knees*: Bent at about 90° with enough space between the back of your knees and the chair to place your fist.
- *Feet*: Placed flat on the floor or supported by a footrest.

Preventing MSDs in the Office

- Workers are encouraged to stand up and get away from the desk and/or computer regularly throughout the day.
- Muscles work best when the body joints are in “neutral” positions. Workers are not recommended to remain in any one position (seated or otherwise) for long periods of time.
- Getting up and walking around, even short distances, throughout the day helps to reduce stress by improving circulation in the muscles and the spine.
- Micro-breaks are useful to allow muscles and joints a rest. Other daily tasks, such as filing and delivery, can be done while taking a break away from the computer.

Chair Position

- Adjust the backrest so the low back support contacts the curve in the back and gives support in that area.
- Adjust armrests so that elbows can rest comfortably on the rests, and shoulders are level and relaxed.
- Lower the seat pan so feet rest comfortably on the floor.
- Chair height is recommended to be adjusted to allow for typing comfortably with “ideal” wrist and arm positions. A footrest can be used if feet do not rest flat on the floor after chair adjustment.

Keyboard and Mouse

- Keyboard and mouse is recommended to be slightly below elbow level and close to the body. The mouse is also best placed right beside the keyboard, and in front of the mousing hand.
- To reduce stress on the hand, try to use the mouse with the opposite hand. This reduces the stress placed on one arm and frees the dominant hand to perform other tasks.
- Try moving the arm and shoulder rather than only the hand when mousing.

Monitor and Document Holder

- Document holders help keep papers vertical or angled so the neck does not have to bend to read them.

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- The document holder is to be the same distance from the eyes as the computer screen.
- The monitor and keyboard are recommended to be directly in front of the worker.
- It is recommended that the top of the monitor and document holder be around eye level when sitting comfortably.
- The monitor is best placed about arm's length away at a comfortable reading distance.
- The monitor should be angled slightly up toward the eyes. Angling the monitor up too high can increase glare.
- Eyesight naturally falls about 20° down from the horizontal, the top of the screen is recommended to be placed around eye level. Line of sight is meant to naturally fall to the middle of the screen.
- If the worker wears bifocals or trifocals, it's especially important to properly adjust monitor height. Tilting the head back to view the screen through the lower portion of the glasses could lead to muscle fatigue in the neck and back. Instead, try lowering the monitor.

Back Care Standard

Construction work puts physical stress on the body. About half of the back injuries are attributed to lifting excessive weight or lifting incorrectly and the rest are the result of slips, trips, and falls. Most back injuries are the result of everyday wear and tear rather than a single traumatic event.

Procedure

Exercise to protect your spine, the muscle supporting your back must be both strong and flexible. A pre-work stretching program is recommended. Warming up prepares your body for the physical work ahead and helps minimize the risk of injury.

The three essentials are Warm-up, Workout, and Cool-Down.

Remember – Check with your doctor before starting any exercise program.

Workplace Posture

- Maintaining a proper posture is the most critical part of good back care. Using our muscular system to control posture minimizes the effects of everyday wear and tear on our spine. Any position held too long is not good for your back. Aches and pains from prolonged working postures are our body's way of warning you to change position. If these warnings are continuously ignored, you will be vulnerable to low back injury.

Lifting

- A weight that is too heavy, lifting in an awkward position, twisting your body while lifting, or doing excessively heavy work are all common causes of low back problems. When lifting, plan your move, size up the load and make sure your path is clear or get help if needed or use other material handling equipment if possible.

Material Handling Equipment

- Different types of equipment have been designed and manufactured to lift and move loads of various shapes, sizes, and weights. This equipment can not only save time and labor – it can save your back.

Hoisting or Moving Heavy Loads

- Equipment is often required to hoist or move heavy loads manually. The mechanical advantage afforded by this equipment reduces the manual effort involved as well as the risk of back injury.