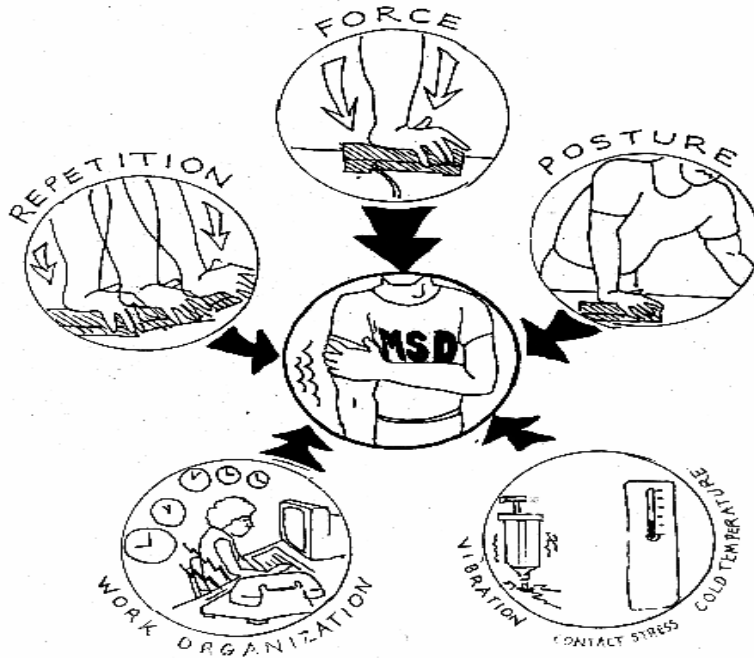


Risk Factors for Musculoskeletal Disorders (With A Focus on Upper Extremity MSD's)



MSD'S ARE CAUSED BY THESE RISK FACTORS

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Risk factors for musculoskeletal disorders are aspects of a job or working conditions that increase workers' risks of being injured. Any one of the following risk factors, or a combination of them, can cause a musculoskeletal disorder:

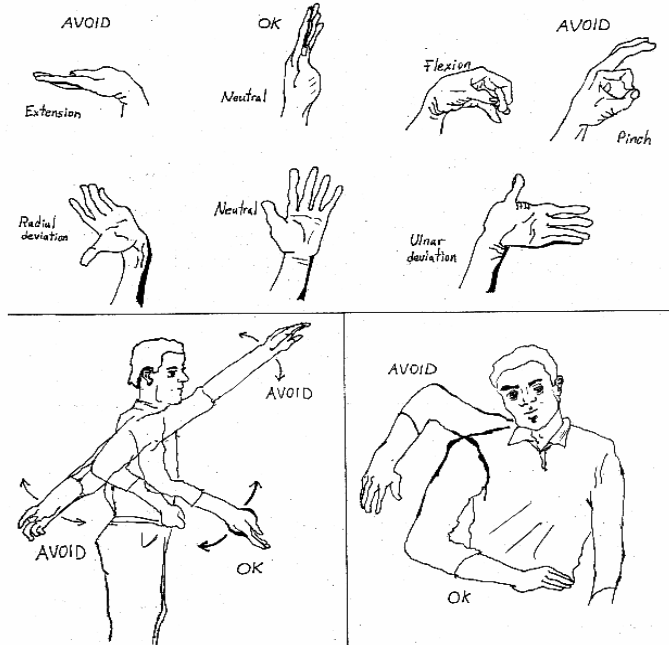
FORCE: Force is a load or pressure that can cause damage to various body parts and tissues. Force is present when you are pushing, pulling or lifting something. Forces on your arms, shoulders, back and legs can affect tendons, blood vessels, nerves, muscles and other soft tissues. Using a "pinch grip" with your fingers instead of a "power grip" with your fist puts three to four times more "force" on tendons in the fingers and hands. Forces are not only problems for those dealing with heavy weights. Keying on a keyboard repeatedly exposes soft tissues in the fingers and hands to forces that can be damaging.

REPETITION: Doing the same motion over and over again without adequate rest in the form of breaks -- even mini-breaks -- "overuses" the same muscles, tendons, and other soft tissues. Job tasks done repeatedly require the same muscles to contract over and over. If the pace of work is increased (as in "speed-up"-- where workers are supposed to get more and more work done in shorter periods of time, or where one worker is doing the job of two) the number of repetitions increases. This adds that much more wear and tear to soft tissues. These body parts can, in turn, "wear out," and permanent damage can result.

POSTURE (AWKWARD OR STATIC):

- Awkward: Certain jobs or tasks may require you to work in an awkward position, such as:
 - working with your arms over your head;
 - twisting, bending and/or reaching (which can be made even more problematic if you are handling a heavy object);
 - working with a bent back, bent wrist, or bent knees.

**AWKWARD POSTURES OF THE
 UPPER EXTREMITIES**



- Jobs, workstations and tasks that force workers to work for extended periods of time with their wrists bent, or with a "pinch grip", or with their arms above shoulder height are jobs where workers are exposed to risk factors for musculoskeletal injuries.
- So too are jobs that require workers to reach behind the "midline" of the body or require workers to work with an "inward" or "outward" rotated position of the elbow. These are all considered "non-neutral" postures.
- The goal is to design tools, workstations and tasks so that workers can work in neutral postures.
- Static: Some jobs may require you to work in a static posture, where you are in one position for a prolonged period of time (sitting, standing, kneeling). Working in these postures can, over time, hurt muscles, tendons and other soft tissues.



CONTACT STRESS: An example of contact stress is when a tool handle or edge digs into the soft tissue of the palm of the hand. Another example is when a job task requires you to use your hand as a hammer. This puts pressure on soft tissues and results in damage to those tissues.

VIBRATION: The vibration from some tools such as jack hammers can damage the soft tissue in the shoulder, arm and hand. Vibration can also be transmitted to the whole body from the ground or from the seat of a vehicle. The vibration can damage soft tissue in the back.

COLD TEMPERATURE: Working in a cold temperature can damage soft tissue that is exposed to the cold.

Work Organization

Workers' risk of developing musculoskeletal disorders is affected by the way in which work is organized, or work organization. Work organization is often defined as "the social aspects of work that organize how things are done, by whom, with what, how often, how long, etc."

Work organization includes factors such as: pace of work, workload, staffing levels, hours of work, supervision, production quotas, deadlines, and number and length of rest breaks.

How work is organized can increase (or decrease) workers' exposure to risk factors for musculoskeletal disorders. For example, if the speed of an assembly line is increased to maximize production, this will often increase the number of repetitive motions workers on that assembly line will have to perform. Working under deadlines or production quotas can cause muscles to tense up, adding to "wear and tear" on soft tissues and increasing the risk of musculoskeletal disorder.

The Result of Exposure to Risk Factors for Musculoskeletal Disorders

Exposure to risk factors for musculoskeletal disorders often results in workers working in pain. If wear and tear reaches a certain point, disability can result. This can affect not only a worker's ability to work, but also to do other activities such as opening a jar, chopping an onion, driving a car, lifting a child, turning a door knob, getting dressed, and holding a



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toothbrush. In severe cases of musculoskeletal disorders, this damage can be permanent (irreversible).