

Prevention of Musculoskeletal disorders through ergonomics



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Musculoskeletal disorders of the low back and upper extremities are an important national health problem, resulting in approximately 1 million people losing time from work each year.

These disorders impose a substantial economic burden in compensation costs, lost wages, and productivity.

Conservative cost estimates vary, but a reasonable figure is about \$50 billion annually in work-related costs.

There is a clear relationship between back disorders and physical load.

**Manual material handling.
Load moment**



Frequent bending and twisting.

heavy physical work



whole-body vibration

- . **For disorders of the upper extremities,**
- repetition, (e.g., frequent reaching, lifting, carrying)**
- force, (e.g., carrying or lifting heavy loads)**
- vibration**

are particularly important work-related factors

Work-related psychosocial factors associated with low back disorders include

low job satisfaction,
job stress



rapid work pace,
monotonous work,



low decision latitude,



work-related psychosocial factors that are associated with the occurrence of upper extremity disorders.



High job demands



High job stress

. A number of characteristics of the individual appear to affect vulnerability to work-related musculoskeletal disorders, including

gender



increasing age



body mass index



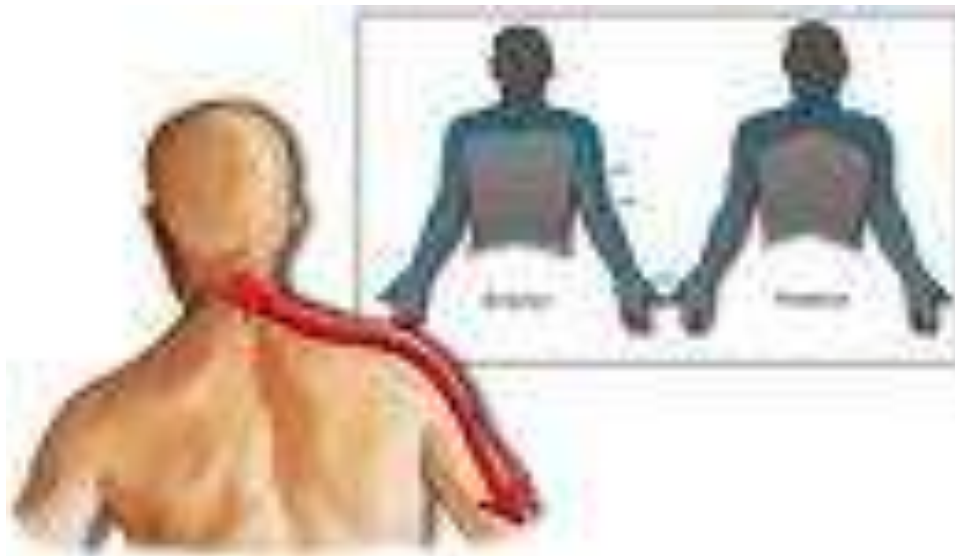
a number of individual psychosocial factors

The application of ergonomic principles to reduce physical as well as psychosocial stressors.

To be effective, intervention programs should include employee involvement ,employer commitment, and the development of integrated programs that address equipment design, work procedures, and organizational characteristics.

Musculoskeletal disorder (MSD)--- Neckpain

There is evidence for a causal relationship between highly repetitive work and neck and neck/shoulder MSDs.



Neck pain

Neckpain with arm pain

Paraesthesia

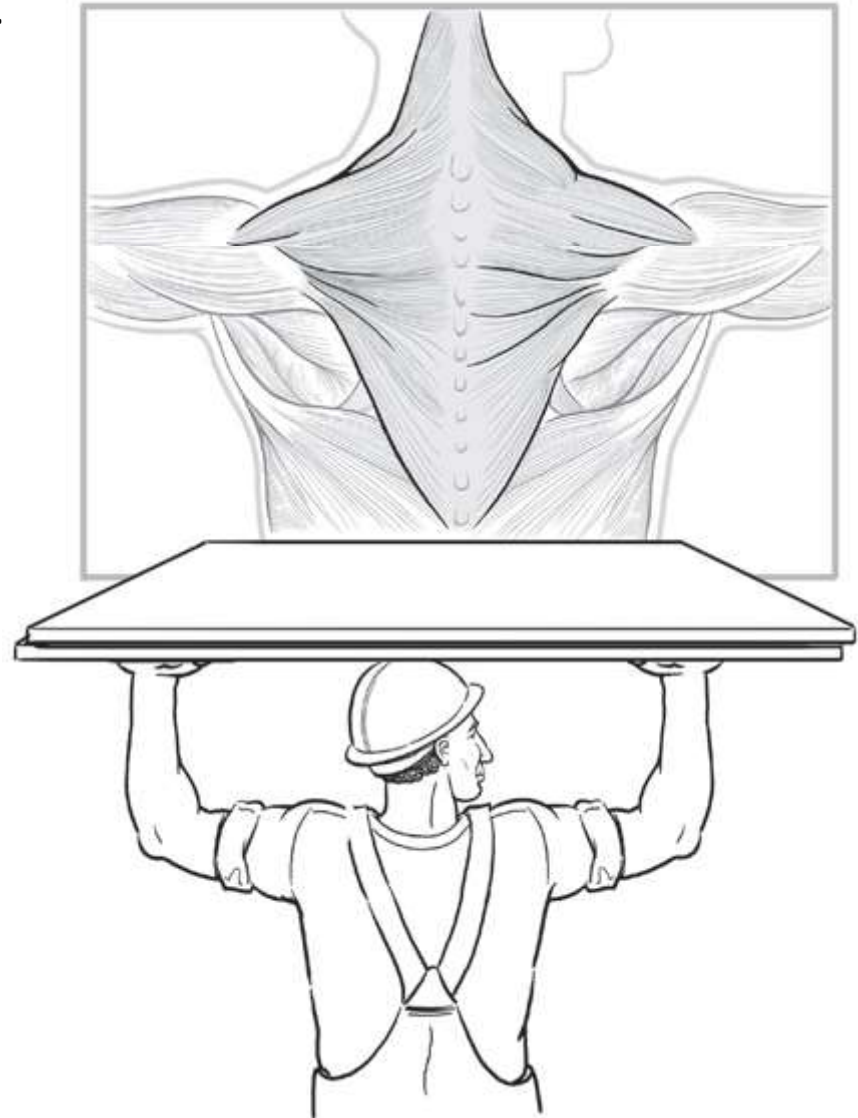
Numbness

Weakness

Neck stiffness

Feeling of tiredness

Carrying even light loads above your shoulder may quickly lead to soreness of neck muscles and shoulder muscles.



Preventive Measures

Avoid repetitive movements.

Don't take heavy weight over head and /or shoulder.

Don't bend forward

Use collar

Do exercise intermittently .

Give hot fomentation.

Consult your doctor, if pain persist.



Musculoskeletal disorders- Shoulder

Shoulder pains and injuries are usually the result of **overworking the shoulder**. When you keep your arm raised above your shoulder (or keep your arm stretched out), your shoulder begins to ache after a short time. It tires easily

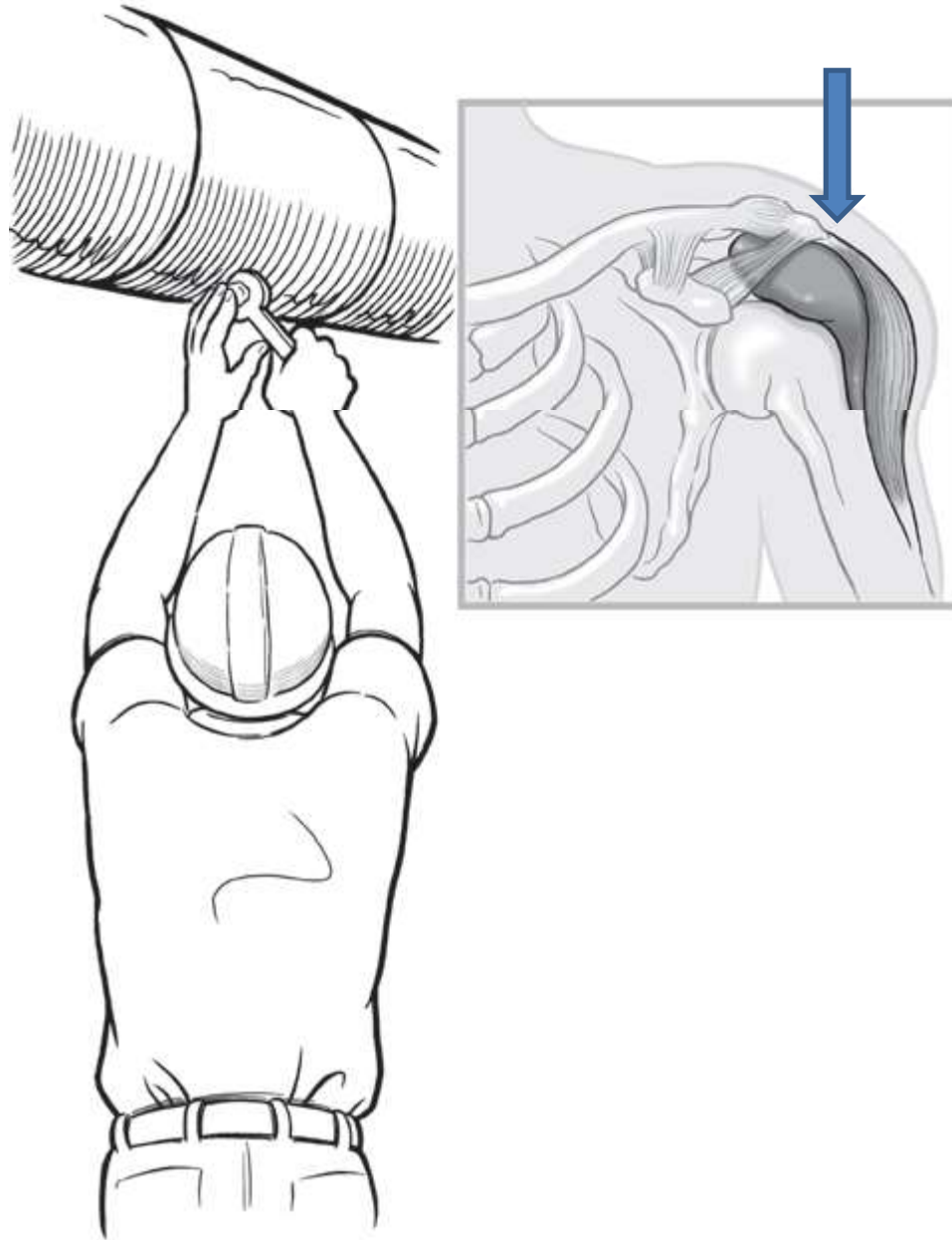


Shoulder pain

Tendinitis

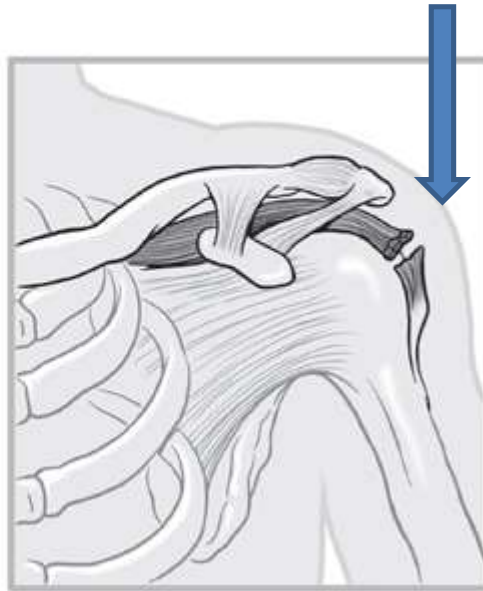
Stiffness

Bursitis





Rotator cuff tear



Preventive Measures

Use platform to avoid overworking the shoulder.

Take intervals

Do stretching exercises intermittently

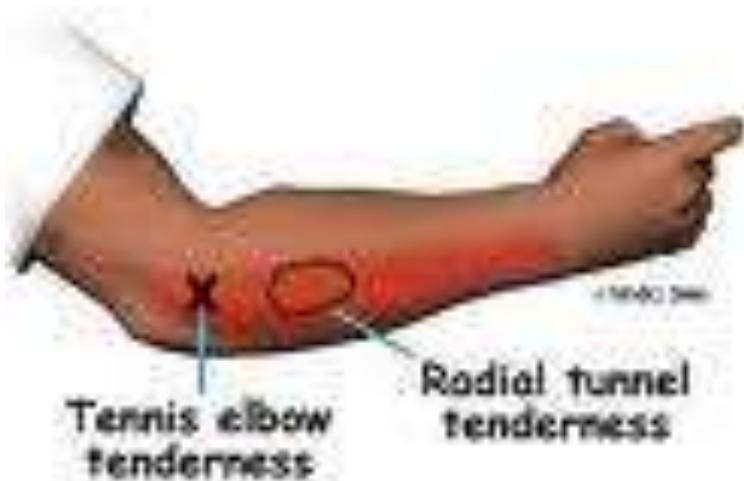
The few prospective studies which have included interventions to decrease workplace exposures that include

**decreasing repetitive work and
less extreme working postures**

showed a decrease in the incidence of neck MSDs and an improvement in symptoms among affected workers

Musculoskeletal disorders- Elbow

Forceful twisting motions may cause strain on your elbow tendons, causing discomfort or pain. This condition is called epicondylitis, also known as tennis elbow



Pain at the elbow.

Unable to lift heavy object with the affected hand.

Preventive Measures

Tennis elbow support

Physiotherapy to strengthen the muscles of forearm.



Musculoskeletal disorders- Hand / Wrist

Carpal tunnel syndrome

There is strong evidence of a positive association between exposure to a combination of risk factors (e.g., force and repetition, force and posture) and CTS



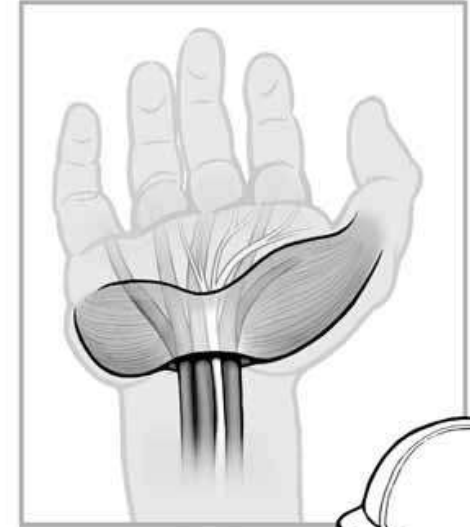
Pain

Paraesthesia

Numbness

Weakness

Poor grip



Preventive Measures through ergonomics

your arms should be parallel to the floor as you're working

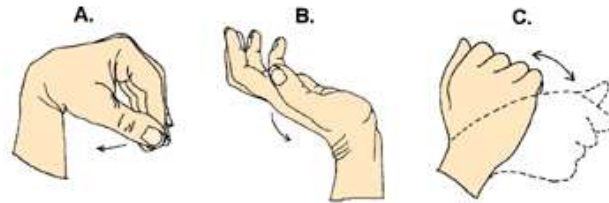
Keeping your hands and wrists aligned with your forearms as you type, use your mouse.

Use of Cock up splint .

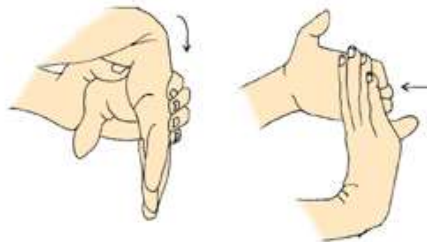
Take frequent breaks from activities to rest, stretch, change positions, or alternate with another activity.



Carpal Tunnel Syndrome Exercises



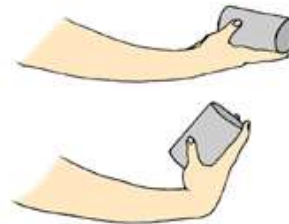
Active range of motion



Wrist stretch



Tendon glides



Wrist flexion exercise



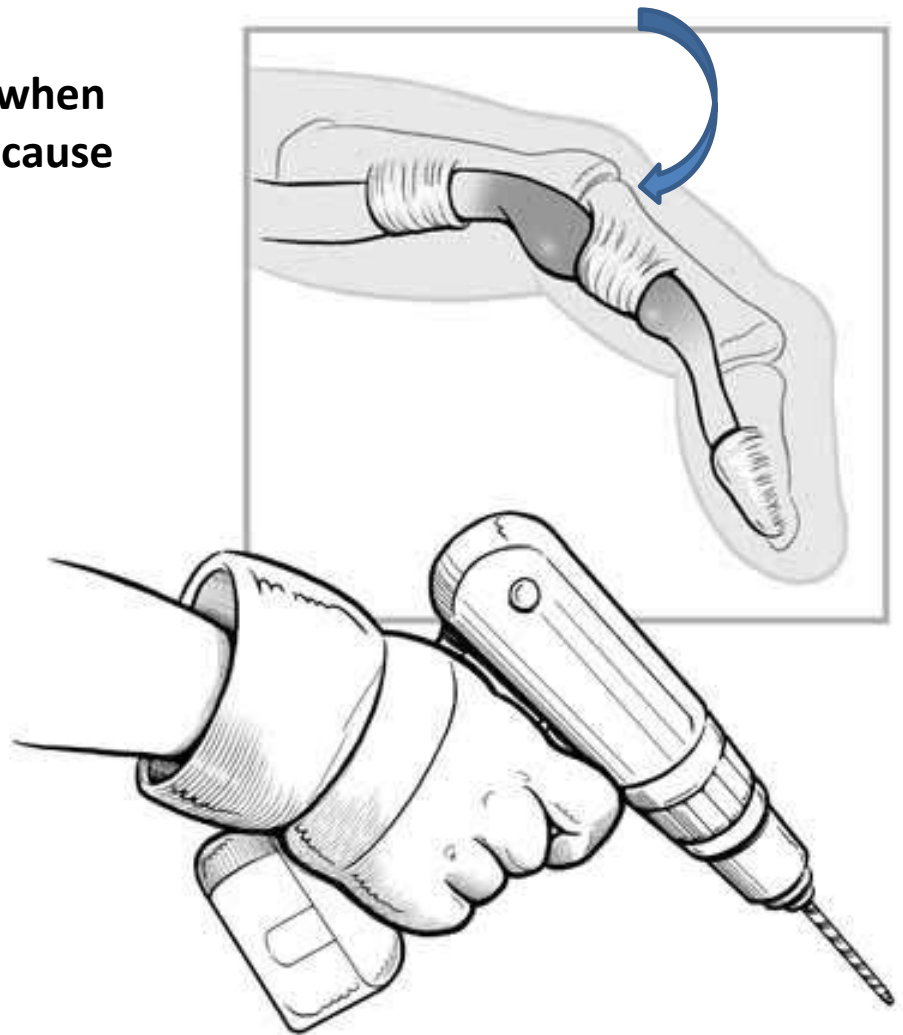
Wrist extension exercise



Grip strengthening

Repeated pressure on a finger (such as when using the trigger on a power tool) may cause discomfort or pain.

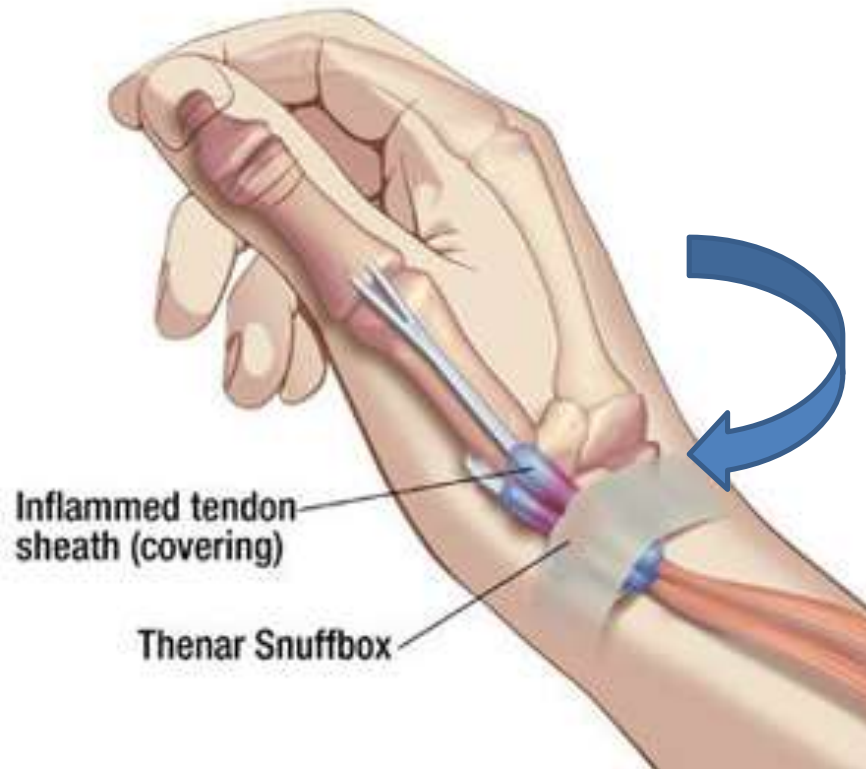
Trigger finger



Musculoskeletal disorders- Hand / Wrist

Wrist Tendinitis

De Quervain's Tenosynovitis

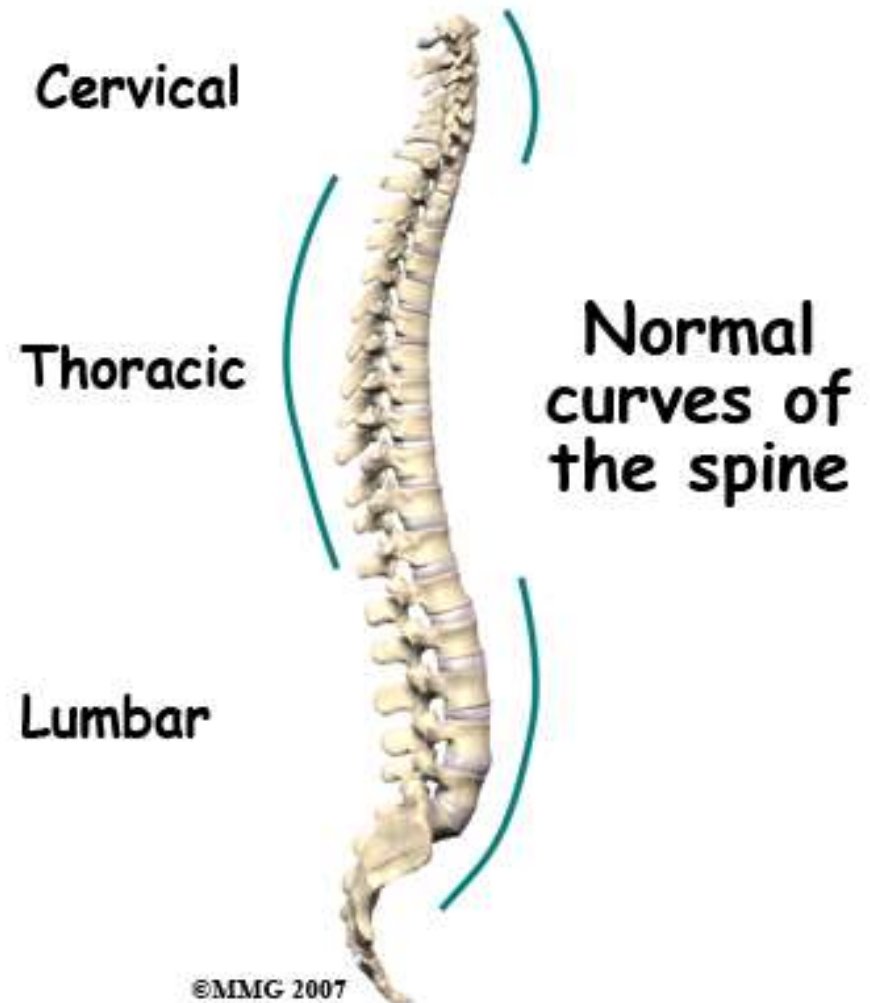


Musculoskeletal disorders- Low back pain

Lifetime prevalence is > 80% in adults

Men and women are equally affected

Aged 30 to 50



Risk Factors

Heavy physical work
Lifting and handling of load



Awkward postures / positions



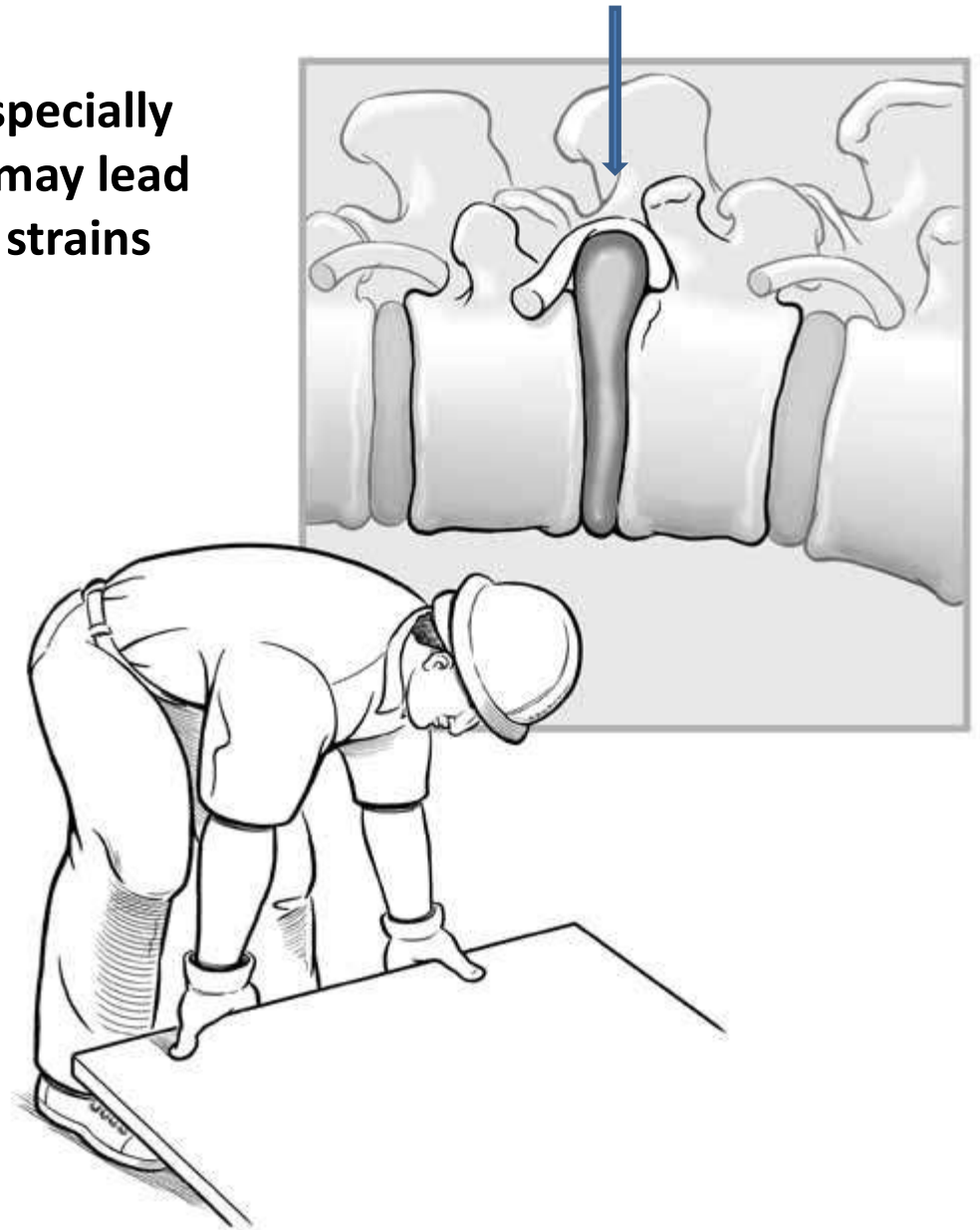
Whole body vibration
(Truck Driving,drilling)



When you bend forward, your back muscles work harder and the *ligaments flex and stretch*. The disc gets squeezed. As they get squeezed they can press on different parts of the spine, including nerves. This can cause back pain



Sudden, quick movements , especially while handling heavy objects, may lead immediately to painful muscle strains

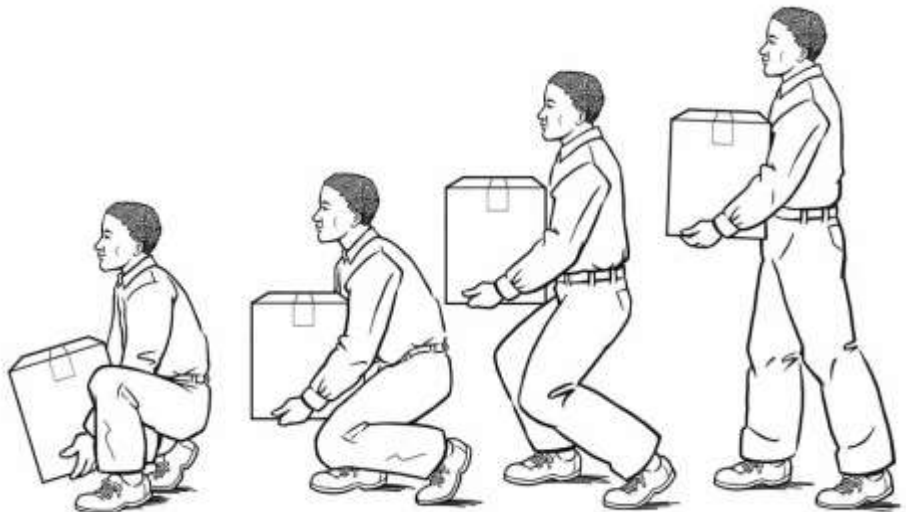


When you pick up or set down a load, don't reach more than 10 inches away from your body.

Don't twist your body.

Lift with your legs, not your back. Keep your back as straight as possible.

Lift the load using a solid two-handed grip.





Simple Stretches for Busy People

(Complete 1-2 of these stretches for every 30 minutes of sedentary work)

Energize Anytime

Checking to see if your deodorant is still working.



Reaching Hands

First Stretch:

SAFE!! Another come from behind win for the Twins!



Second Stretch:

The "Haddafish" - when explaining how big that walleye was that got away.



Chair Stretch

For checking out that new stud muffin in cubicle J-13



Feet & Ankles

To maximize publicity of the new \$230 shoes you bought at the mall



Hands Behind Back

A.K.A. The "Power Hurl" when you had one too many at the Legion last night. Followed by:



Forward Release



Open Chair Stretch

She's checking you out, flex the pec's, baby!



Kick Back Pose

Sporting confidence for the well endowed.



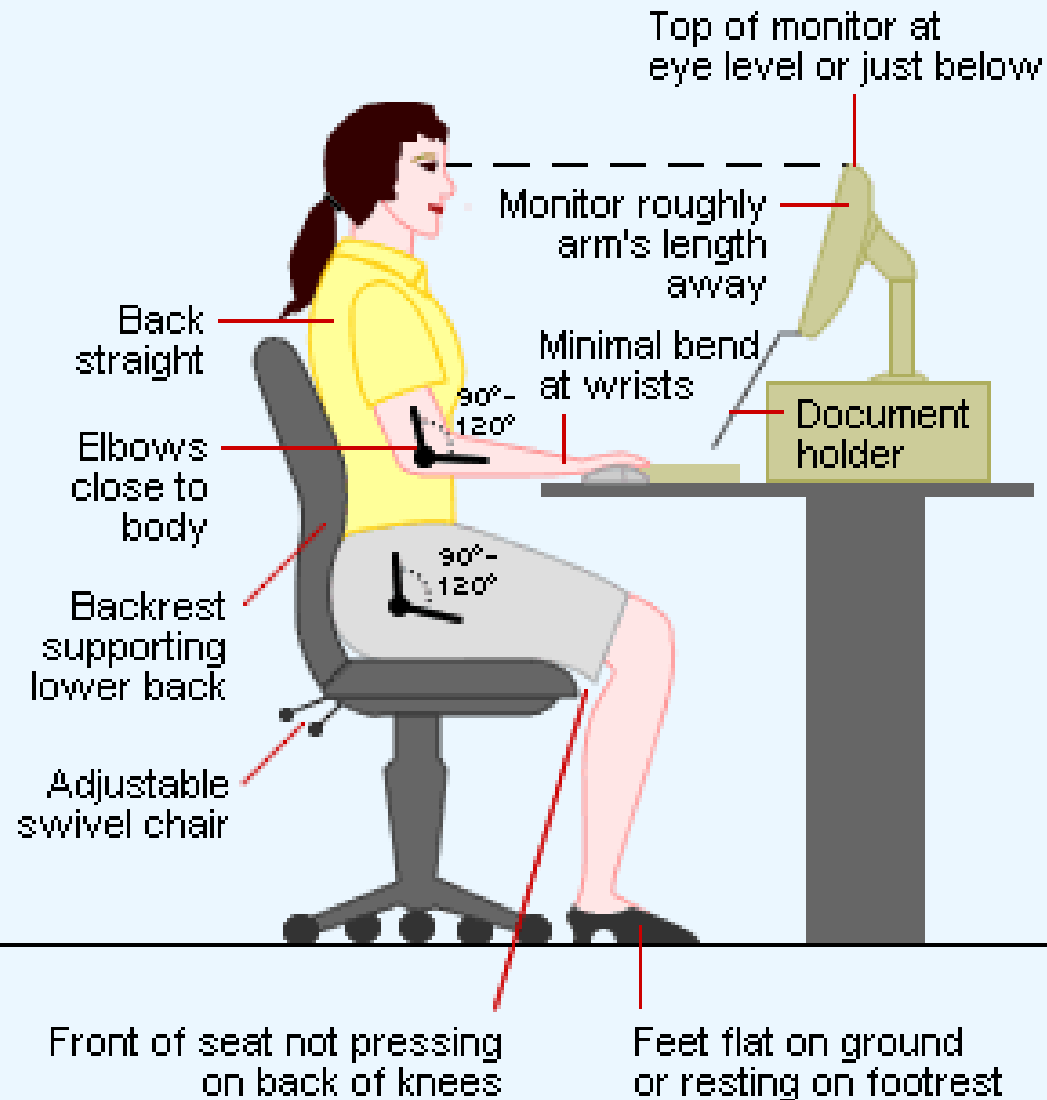
OFFICE ERGONOMICS I

Poking fun at some dryyyy lecture material.

Daily exercise



Workstation ergonomics: ideal set-up



Methods of Reducing Awkward Positioning & Improving Posture

Keep reaching to a minimum.

Assure proper fit of the chair.

There should be support for the lower back.

Height should be adjustable in relationship to the work surface so that the shoulders are relaxed and the elbows are positioned at the side of the body (in-line with the shoulders).

The work should be positioned at a height that allows the elbows to be open slightly greater than 90 degrees.

A foot-rest should be used when necessary

The work should be positioned directly in front of the body to avoid excessive reaching or turning.

Keep frequently used items within an easy to reach work space.

Maintain a neutral wrist position.

Methods of Reducing Force

Blades should be kept sharp.

Wheels on carts should be clean and free of debris and roll easily.

Use weaker springs in triggers

Use longer handles for better leverage.

Alternate between hands whenever possible if performing a repetitive task that requires heavy force.

Organize your work station so that all the needed materials are within easy reach.

Don*t use your hand as a hammer.

Avoid sudden impact, jerking, or sudden start-stop movements.

When lifting or moving objects, keep them close to your body.

Push rather than pull.

Methods of Reducing Repetition

Look for ways to break up the repetitive components of a job. For example, after an hour of so of typing, make a few phone calls, walk down the hall to consult with a co-worker (rather than e-mailing), stretch or get a drink of water.

If your job requires a variety of duties, switch frequently between tasks rather than completing each one before moving on.

Do some research and find a different tool that makes the job easier

Let the tool do the work instead of the body. Use power tools (for example, an electric screwdriver or tools with special ratchet devices) or automation when possible.



Thank you