Office Ergonomics

An Overview
Presented for the Physics Department
4/12/07
Room 2-160

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Ergonomics…

Definition

What is Ergonomics?

“Ergo”n- work “Nomik”os – law

That branch of science that is concerned with the achievement of optimal relationships between workers and their work environments.

Ergonomics…

Or More Simply said:

Ergonomics is fitting the work/work environment to the worker and not the other way around!

Ergonomics…

Areas that will benefit from Ergonomics:

Manual Material Handling

Computer/Office Workstations

Laboratory Workbenches

HAZARDS

Office personnel are exposed to chemicals, lifting hazards, ergonomic issues, slip and trip hazards, cuts, etc.

JRA for Office

- The Physics department has a Job Risk Assessment for Office work.
- Revised on April 10.
- Items discussed here

Musculoskeletal Disorders (MSDs)

What are they?

MSDs are injuries that result from repeated strains.

Other common names for MSDs:

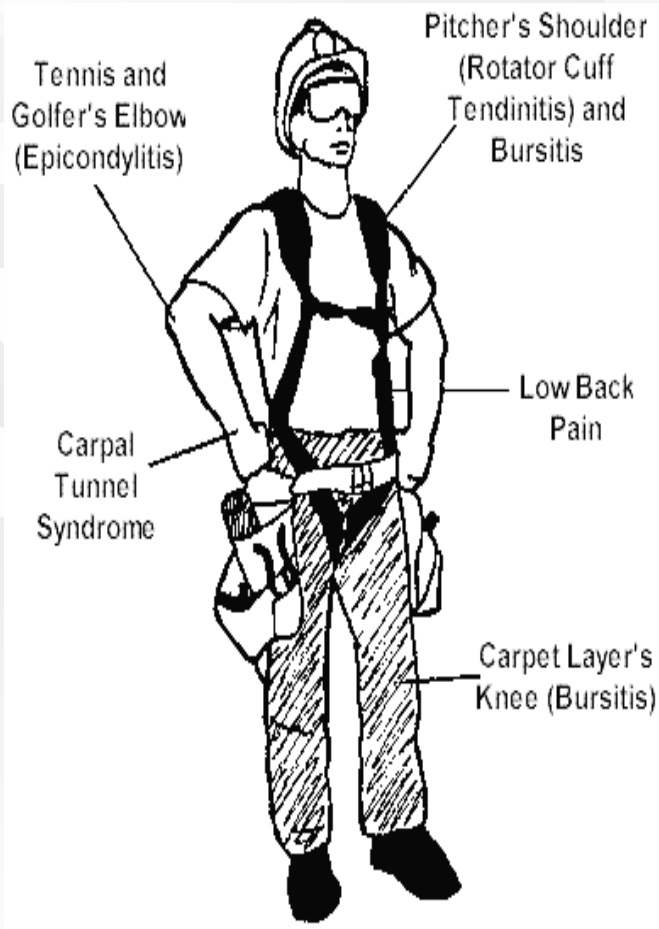
- Cumulative Trauma Disorders
- Repetitive Motion Injuries

They may be prevented through ergonomic practices and applications!

Musculoskeletal Disorders (MSDs)

- Common MSDs

- Factors contributing to MSDs:
  - Excessive forces
  - Cold
  - Awkward postures
  - Vibration
  - Personal characteristics
  - Repetition
  - Gender



Musculoskeletal Disorders (MSDs)

What types of work are most likely to pose ergonomic hazards?

MSDs affect workers in almost every industry and workplaces of all sizes.

The disorders occur more frequently in jobs that involve:

- Manual Material Handling
- Heavy Lifting
- Twisting movements, and
- Long hours of working in awkward postures.

Musculoskeletal Disorders (MSDs)

How do you know if you have an MSD?

You could have a work-related MSD if you experience any of the following:

- Numbness in your fingers,
- Numbness in your thighs,
- Difficulty in moving your finger,
- Stiff joints, or
- Back pain.

Overview of Accidents: As of end of Feb, 2007 there were….

- 13 DOE Reportable cases
- 17 first aid cases
- 7 DARTS

Only one case for physics.

At least 2 injuries have been a result of moving

- An employee needed to remove a box in the middle of a stack of boxes. As he removed that middle box, the heavy boxes on top fell onto his thumb, tearing a ligament. He required surgery, making this case recordable and DART.

Several have been trips, slips and falls

- An employee tripped and fell on the sidewalk, injuring her left knee.
- An employee walked up a handicapped ramp, caught her foot in a crack and fell, injuring her right wrist.

Other injuries included

- An employee reached into a metal cabinet and lacerated his left index finger An employee struck her right knee against a cabinet door while putting away supplies.
- An employee was putting binders together, punching paper with a three-hole punch and bruised her left wrist.
- An employee lacerated his finger while cleaning out a trash can in his office. Prescription medication was required making this case recordable.

Other injuries included

- Putting away supplies and knee was hit on cabinet door
- Shoe caught in crack and fell causing wrist /hand sprain
- Cut finger on a bread knife
- Tripped on sidewalk

Other injuries included

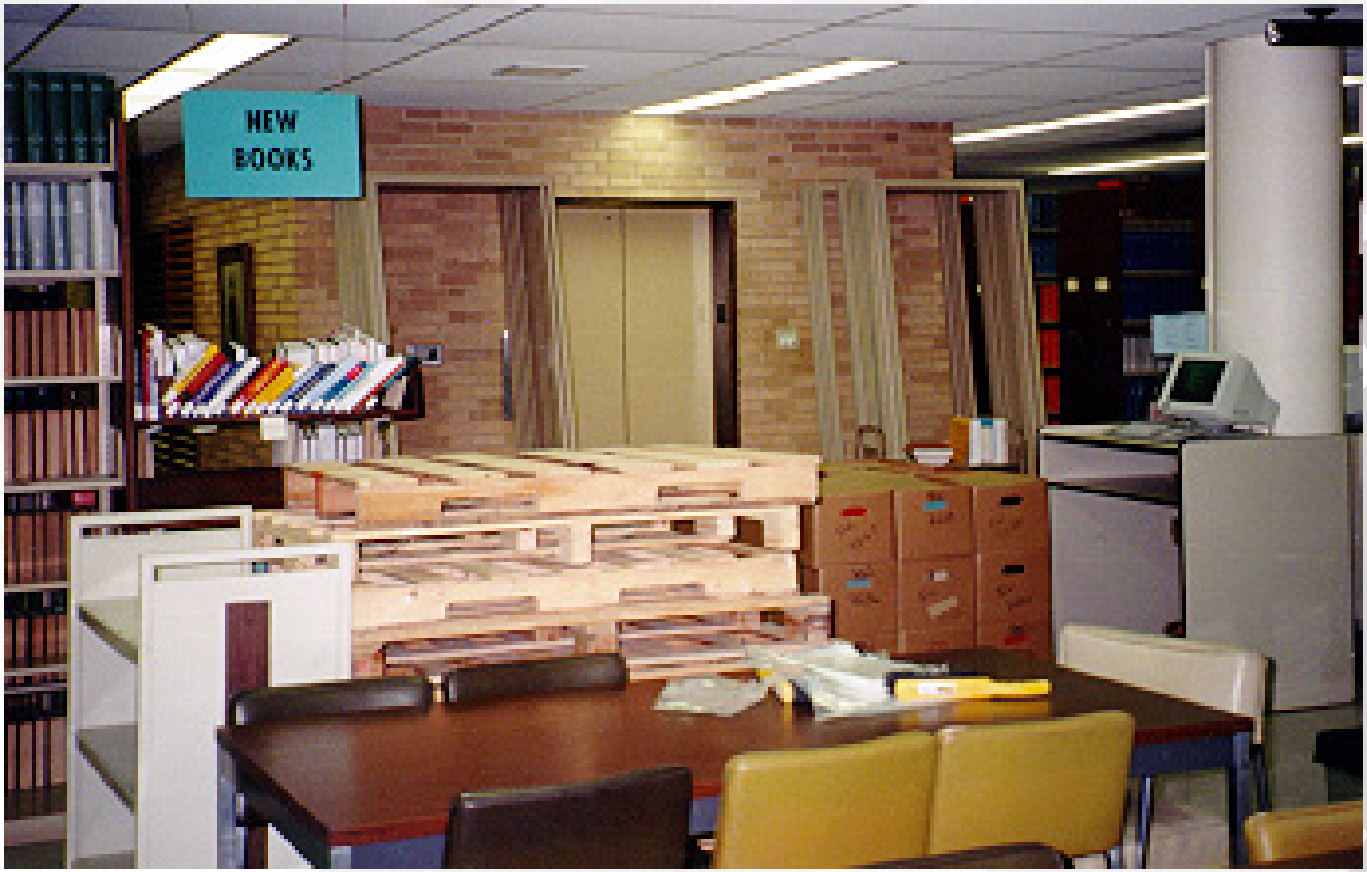
- Walking past cabinet, struck knee on corner
- Fell walking up stairs
- Slipped on knife
- Cut thumb on a razor in drawer
- Fell down and twisted ankle
- Stepped on hard object and caused foot pain
- Cut thumb on cabinet door

Musculoskeletal Disorders (MSDs)

To Prevent MSDs- Always Remember to Avoid….

-Static Postures
-Awkward postures/movements
-Repetitive Motions

Shelving



Scanning, Shredding and Photocopying

- Overhead reach
- Cartridge changes
- Repetitive motion
- Twisting and bending

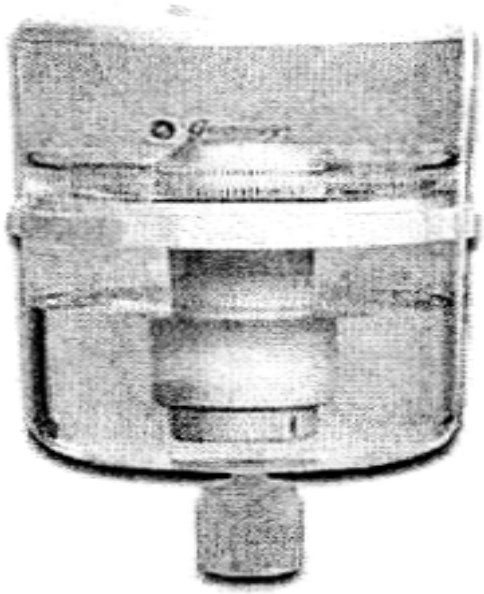
Lifting

Loading Bottled Water

Potential Hazard:

- Loading bottled water onto water coolers exposes employees to several risks.
- A bottle weighs approximately 48 pounds. To load a bottle, the employee
  - must lift it up, over and onto the water cooler (while trying to avoid spilling the bottle).

awkward task places strain on the employee's back, shoulders, arms and legs (Another hazard is that employees may slip and fall as a result of spilled water.



Water Filtration System
Model GWF7

Greenway Water Bottles and Filters provide the ac convenience of supplying filtered water directly fro water dispenser, without going to the store for thos jugs of water! Filtered water when you need it, safe easy at a fraction of the cost of buying bottled wate

- Fits most brand name water dispensers
- Granulated, activated Carbon (GAC) filter reduc particulate, chroline taste and odor
- Fine fiber and mesh filter reduces small particul and directs flow of water for processing
- Ion exchange resin
- Ceramic core filter is the final polishing filter
- Float ensures NO LEAKS
- Calendar dial reminds you when to change you
- One filter will last up to 6 months and filters ove liters of water
- Easily refills by pouring water into jug with a wa pitcher (not included)

Specification

Plastic : SAN (Styrene acryl nitrille)	**Unit Net Weight lbs/kg :** 3 / 1.4
Warranty : 1 year excluding filter	**Carton Dimensions :** w x d x h (in) : 10.7 x 10.7 x 11.4 w x d x h (cm) : 27.2 x 27.2 x 29

Sizes and specifications are approximate,
and subject to change without notice.

Plan your lifting task

- Size up the load and check overall conditions
- Check route for clearance

  - and obstacles
- Use a handcart or dolly, etc. when possible
- Break down large and heavy loads
- Know your limits
- Seek help if necessary
- Take extra care with awkward tasks

Lifting

- Use good lifting techniques - when lifting items off a surface lower than the waist, remember to squat to lift instead of bending.
  - Squatting uses the legs to raise the item while bending places greater strain on the back.
  - Do not twist or reach, do not lift boxes above your shoulder, and get as close as possible to the box before attempting to lift.

Carry

- Hold the load close to your body
- Look where your are walking
- Take extra care carrying up and down stairs
- [illegible] twist your body, move your feet to

DON'T!!!

Lower

- Bend your knees to lower the load
- Don’t trap your fingers and toes
- Pull it down first, then slide it into place
- Don’t over-reach or stretch

Pay attention to surroundings

- Trip and fall hazards due to housekeeping issues, Slow down.

Housekeeping

Other issues have to do with going up and down stairs and slippery floors due to weather or having items collapse

Cut Hazards

- Even an office environment has hazards that can cause cuts and lacerations. It is important that employees are aware of these hazards and take the necessary steps to protect themselves.
  - Wear gloves to prevent paper cuts if you are doing a lot of filing or purging.
  - Use the appropriate scissors or tools to cut tape and open and close boxes

Office Ergonomics

Improving Computer Workstations

(General Office Ergo Guidelines)

Sources of VDT Discomfort

- Prolonged deviation from “neutral” positions
  - Bent wrists (up, down, in, out)
  - Long reaches (for keyboard, mouse, tel.)
  - Twisting (keyboard here, monitor there)
  - Head down, head up, in constant motion
  - Poor or no back support; no wrist support
  - Feet dangling / crammed into small space
  - Holding the phone while you type
  - Monitor size, location, poor mid range vision/bifocals
  - Poor keyboarding technique -- a very common problem

Neutral Postures

Good Working Positions

To understand the best way to set up a workstation, it is helpful to understand the concept of neutral body positioning.

This is a comfortable working posture in which your joints are naturally aligned.

Neutral Postures

Working with the body in a neutral position reduces stress and strain on the muscles, tendons, and skeletal system and reduces your risk of developing a musculoskeletal disorder (MSD).

- The following are important considerations when attempting to maintain neutral body postures while working.

Important Considerations

- **Hands**, **wrists**, and **forearms** are straight, in-line and roughly parallel to the floor.
- **Head** is level, or bent slightly forward, forward facing, and balanced. Generally it is in-line with the **torso**.
- **Shoulders** are relaxed and **upper arms** hang normally at the side of the body.
- **Elbows** stay in close to the body and are bent between 90 and 120 degrees.

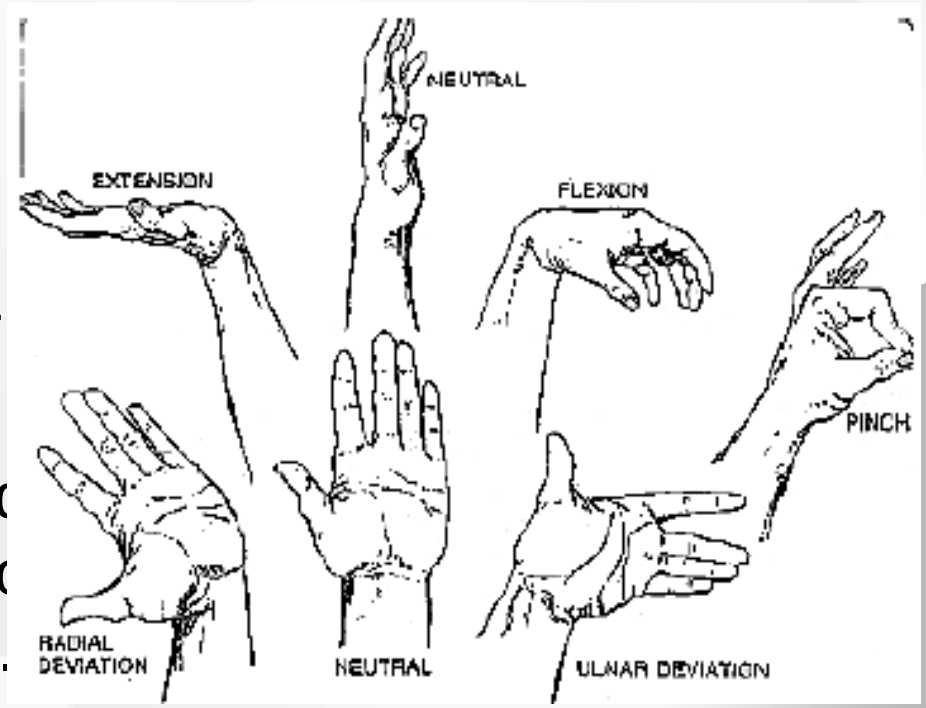
Considerations continued

- **Feet** are fully supported by floor or footrest.
- **Back** is fully supported with appropriate lumbar support when sitting vertical or leaning back slightly.
- **Thighs** and **hips** are supported by a well-padded seat and generally parallel to the floor.
- **Knees** are about the same height as the hips with the **feet** slightly forward.

Wrist Postures

Don’t …

- Bend wrist back more than 30 degrees or down more than 20 degrees repeatedly or for extended periods
- Bend the wrist from sid to side repeatedly or fo extended periods (e.g. mouse, trackball)



Key Preventative Measures

Avoid extended reaches, repetitive motions, and awkward postures.

- Take posture breaks and exercise hands, arms, and shoulders (at least every two hours)
- Maintain good neutral posture
- Exercise to improve your body conditioning

Office Ergonomics

General Office Ergo Guidelines:

CHAIR:

* Ideally, elbows should rest comfortably at your sides and forearms should be parallel to the floor

*The normal **curves** of the spine, especially the curve in the lower back, should be maintained while sitting

*Adjust the seat height so hips are at or above knee level, feet are supported, and there is no pressure on the back of the thighs

* If the seat depth is adjustable, make sure there is some space between the back of the knees and the front edge of the chair.

Office Ergonomics

General Office Ergo Guidelines:

CHAIR:

* There should be 2-5 inches of thigh clearance.

* Feet should lay flat on the ground.

* Five star base.

*Armrests are generally not needed for most tasks. If armrests are desired, they should be fully adjustable

Office Ergonomics

General Office Ergo Guidelines:

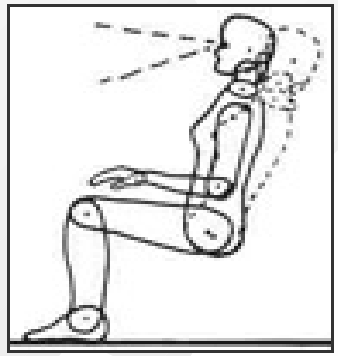
CHAIR:

* Try to always maintain a neutral posture when sitting at your computer workstation!

Neutral Posture!

Reclined Sitting Postures

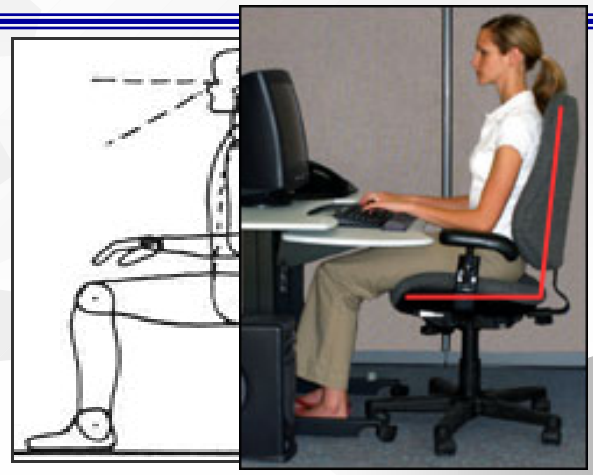
- Use this position for resting, conversation, and other activities with the eyes focused forward or upward.
- Most people recline to watch TV, and some recline to drive or use a computer.



The user's torso and neck are straight and recline between 105 and 120 degrees from the thighs.

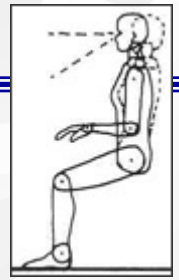
Upright Sitting Postures

- Are used for working with the hands close to the body and the eyes focused straight ahead. Most people sit upright to type and eat, and some sit upright to drive or use a computer.



The user's torso and neck are approximately vertical and in-line, the thighs are approximately horizontal, and the lower legs are vertical.

Forward/Declining Sitting Postures

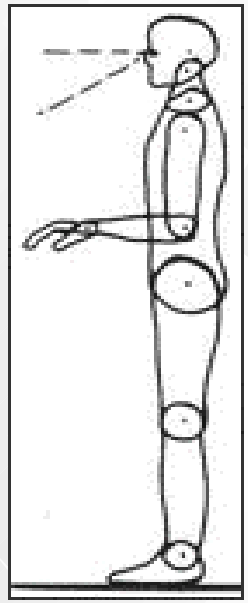


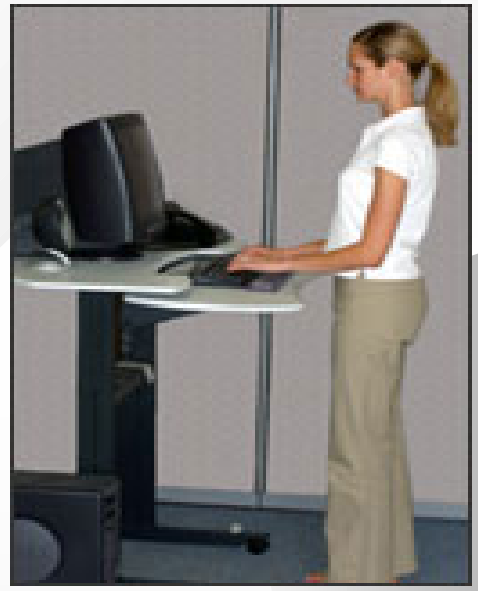
- Are used for reaching tasks and tasks with the eyes focused downward. Writing, drafting, dentistry, and using a microscope usually require

The user's thighs are inclined with the buttocks higher than the knee and the angle between the thighs and the torso is greater than 90 degrees. The torso is vertical or slightly reclined and the legs are vertical.

Standing posture

- The user's legs, torso, neck, and head are approximately in-line and vertical. The user may also elevate one foot on a rest while in this posture.





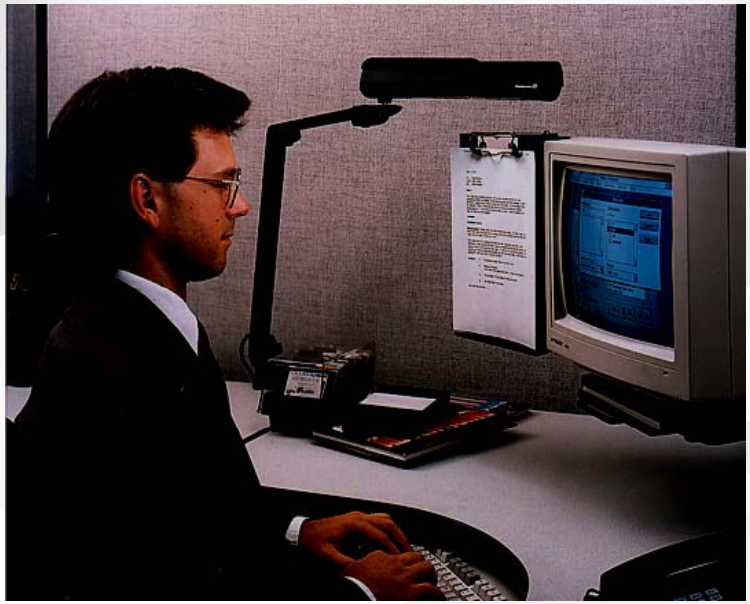
Office Ergonomics

CAUTION:

Even a "perfectly" adjusted chair is not good for a long period of time!

BNL & Ergonomics...

General Office Ergo Guidelines:



MONITOR:

* There should be no glare on the screen

* Top of the monitor should be approximately at eye level

* Monitor should be placed directly in front of you.

* Tilt the monitor so that it faces your eyes.

Office Ergonomics

General Office Ergo Guidelines:

MONITOR:

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Office Ergonomics

General Office Ergo Guidelines:

MONITOR:

* IDEAL DISTANCE

You can approximate this distance without taking an actual measurement!

Office Ergonomics

General Office Ergo Guidelines:

KEYBOARD/MOUSE:

* Keyboard tray should be placed so that:

1. A neutral wrist posture is maintained.

2. There is adequate thigh/leg clearance.

3. Mouse should be at the same level as the keyboard.

4. There is a wrist rests that supports both wrists.

5. It is positioned in front of you.

Office Ergonomics

General Office Ergo Guidelines:

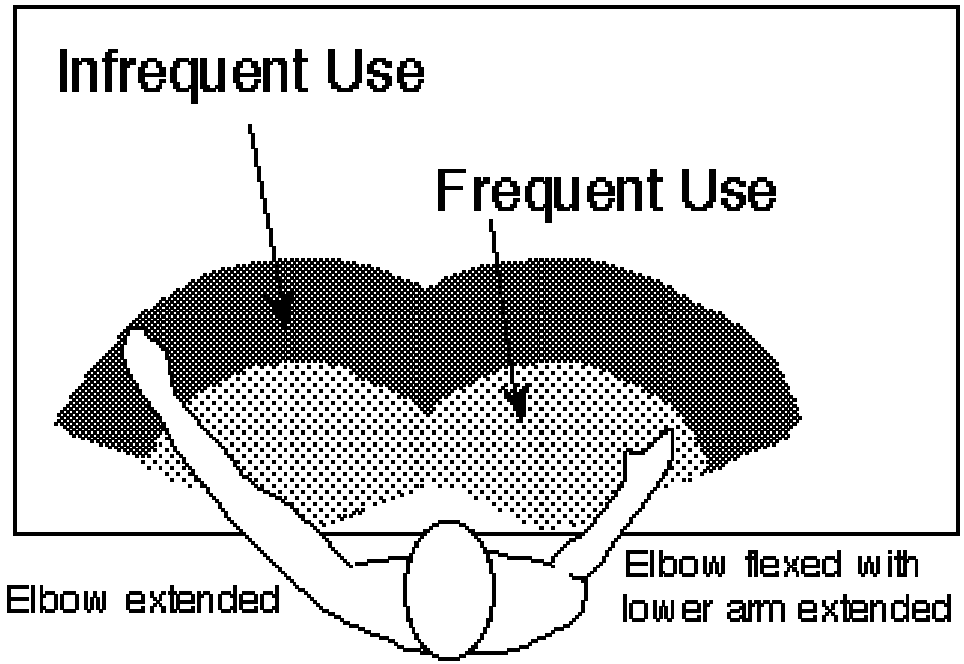
TELEPHONE:

* Consider a head set or a shoulder rest when using the phone frequently.

Office Ergonomics

General Office Ergo Guidelines:

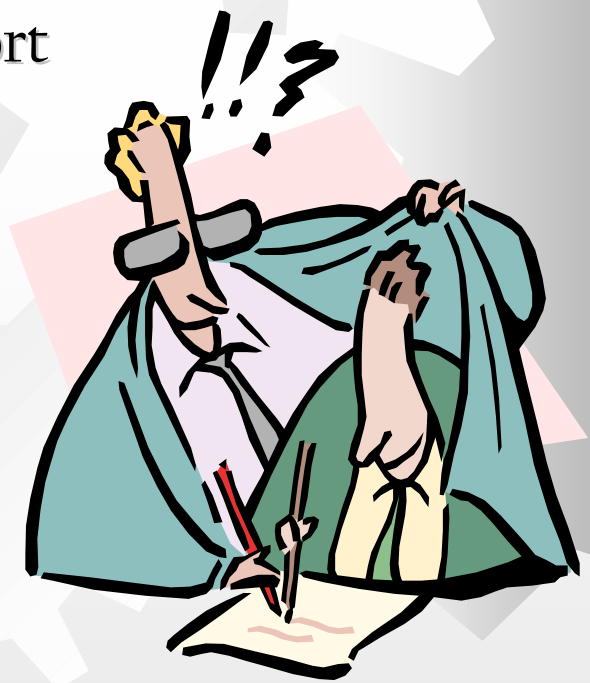
General Layout:



Complaints & Solutions

Common Office Complaints & Solutions:

- Neck tension in upper back and shoulders
- Hand, wrist and lower arm discomfort
- Lower back pain
- Thigh discomfort
- Lower leg and foot discomfort



Complaints & Solutions

Common Office Complaints & Solutions:

Neck tension in upper back and shoulders

PROBLEM:

- Head too far forward during reading or writing
- Head is turned to the right or left

Complaints & Solutions

Common Office Complaints & Solutions:

Neck tension in upper back and shoulders

SOLUTION:

- Reposition documents, keyboard and screen to keep the head looking forward, keeping the eyes focused slightly down.

Complaints & Solutions

Common Office Complaints & Solutions:

Neck tension in upper back and shoulders

PROBLEM:

- Head is unsupported in a reclined position during reading, writing, or viewing the VDT screen.

SOLUTION:

- Tilt the seat and backrest forward to keep the head and trunk relationship more vertical, or get a headrest chair.

Complaints & Solutions

Common Office Complaints & Solutions:

Neck tension in upper back and shoulders

SOLUTION:

- Reposition documents, keyboard and screen to keep the head looking forward, keeping the eyes focused slightly down.

Complaints & Solutions

Common Office Complaints & Solutions:

Hand, wrist and lower arm discomfort

Problem:

- laying wrists on sharp surfaces/ edges

Solution:

- Use a wrist rest
- Never lay wrists on sharp surface/edge
- Reduce application of force to the keys

BNL & Ergonomics…

- Common Office Complaints & Solutions

Hand, wrist and lower arm discomfort

PROBLEM:

•Wrist(s) is deviated in unnatural position

• Wrist(s) are resting on a sharp edge/surface

• Excessive application of force to the keys

Complaints & Solutions

Common Office Complaints & Solutions:

Lower back pain

PROBLEM:

- The chair is too high and the legs are dangling.

SOLUTION:

- Sit deeper in the chair.
- Adjust the backrest by tilting the angle.
- Lower the chair height or use a proper height footrest.

Complaints & Solutions

Common Office Complaints & Solutions:

Lower leg and foot discomfort

PROBLEM:

Too much pressure on the soft tissue area (popliteal) behind the knee.

SOLUTION:

Sit further forward in the seat pan. Adjust the backrest further forward as needed.

BNL & Ergonomics…

Common Office Complaints & Solutions

Buttock area discomfort

PROBLEM:

- Sitting too far forward in the seat pan and not using backrest.

SOLUTION:

- Sit further back in the chair but leave 2" to 4" between the popliteal area behind the knee and the waterfall front of the chair.

Ergonomics

In general, you want to avoid:

- REPETITIVE MOTIONS
- AWKWARD & STATIC POSTURES
- EXCESSIVE FORCES
- EXTENDED REACHES

and always maintain a neutral posture when possible!

Ergonomics

caution!

JUST BECAUSE SOMETHING IS LABELED AS “ERGONOMIC” IT DOESN’T MEAN IT’S SUITED FOR YOU! YOU MUST FIND THE RIGHT FIT FOR YOU!

Ergonomics

Ergonomics is COMMON SENSE!

Through the application of ergonomic principles and ideas, we can prevent muskuloskeletal disorders, be more comfortable in our work area, be more efficient and live healthier lives!

It's up to YOU!

Ergonomics

REMEMBER…

- PREVENTION is the key so don't ignore any symptoms. It's never too late to apply ergonomic principles in the office and at home!

-For an ergonomic evaluation of your workstation call the Safety and Health Services Division at Ext. 7475/2027.

- You can also check out the BNL SHSD website for online ergonomic bulletins.

Ergonomics

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Application Exercise

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How can this be improved?

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Application Exercise

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How can this be improved?

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