Office Ergonomics

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OHCOW

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Centres de santé des travailleurs (ses) de l'Ontario Inc.

Definition of Ergonomics

"The Science of studying people at work, and then designing the working environment to ensure that they can be safe, healthy, effective and comfortable."

GOAL IS TO:

Fit the Job to the Worker
NOT TO
Fit the Worker to the Job

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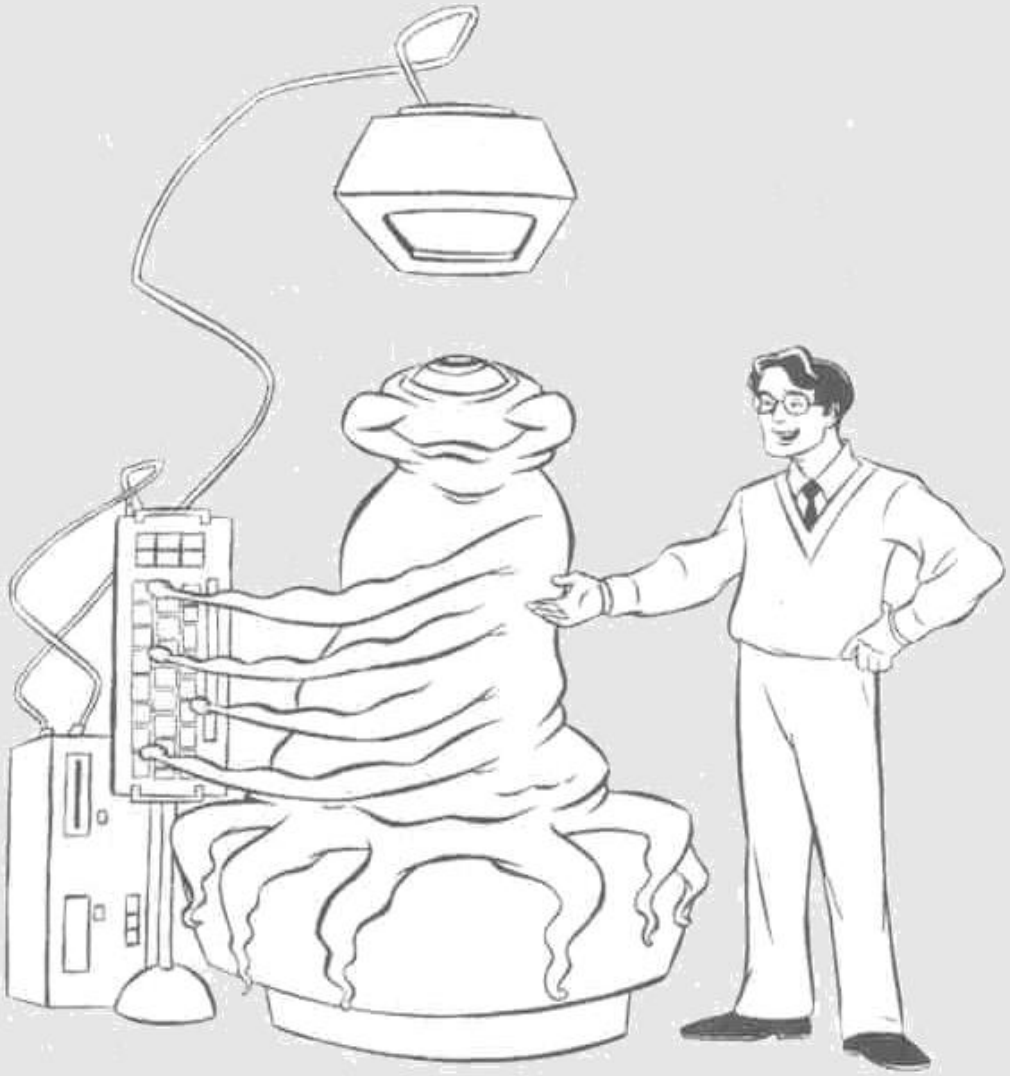
Fitting Your Needs



- Office equipment often selected on aesthetics

- Always choose comfort and function over aesthetics (fit your needs)

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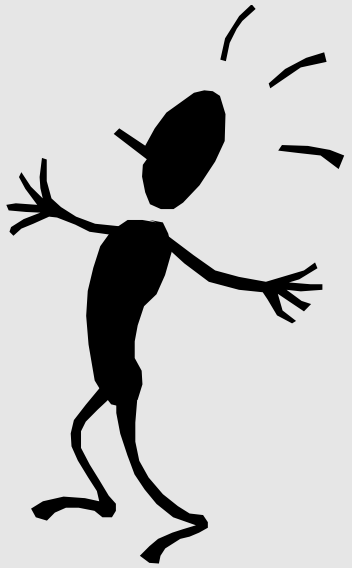
3 Main Injury Risk Factors

In order to prevent an injury, you need to know what may be causing it!

The "BIG 3"

Force
Repetition
Posture



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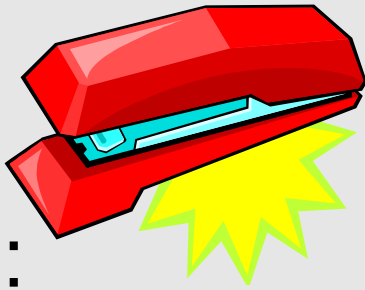
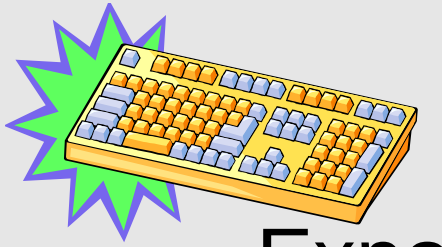
#1. Force



Exposure to high force in office:

- Aggressively striking keys
- High tension paper clips to large bundles of paper
- Stapling, three hole punch

#2. Repetition



Exposure to repetition in the office:

- Keying
- Mousing

These factors also need to be addressed:

- Duration (length of task & shift)
- Recovery Time (breaks, time away from work)

#3. Posture

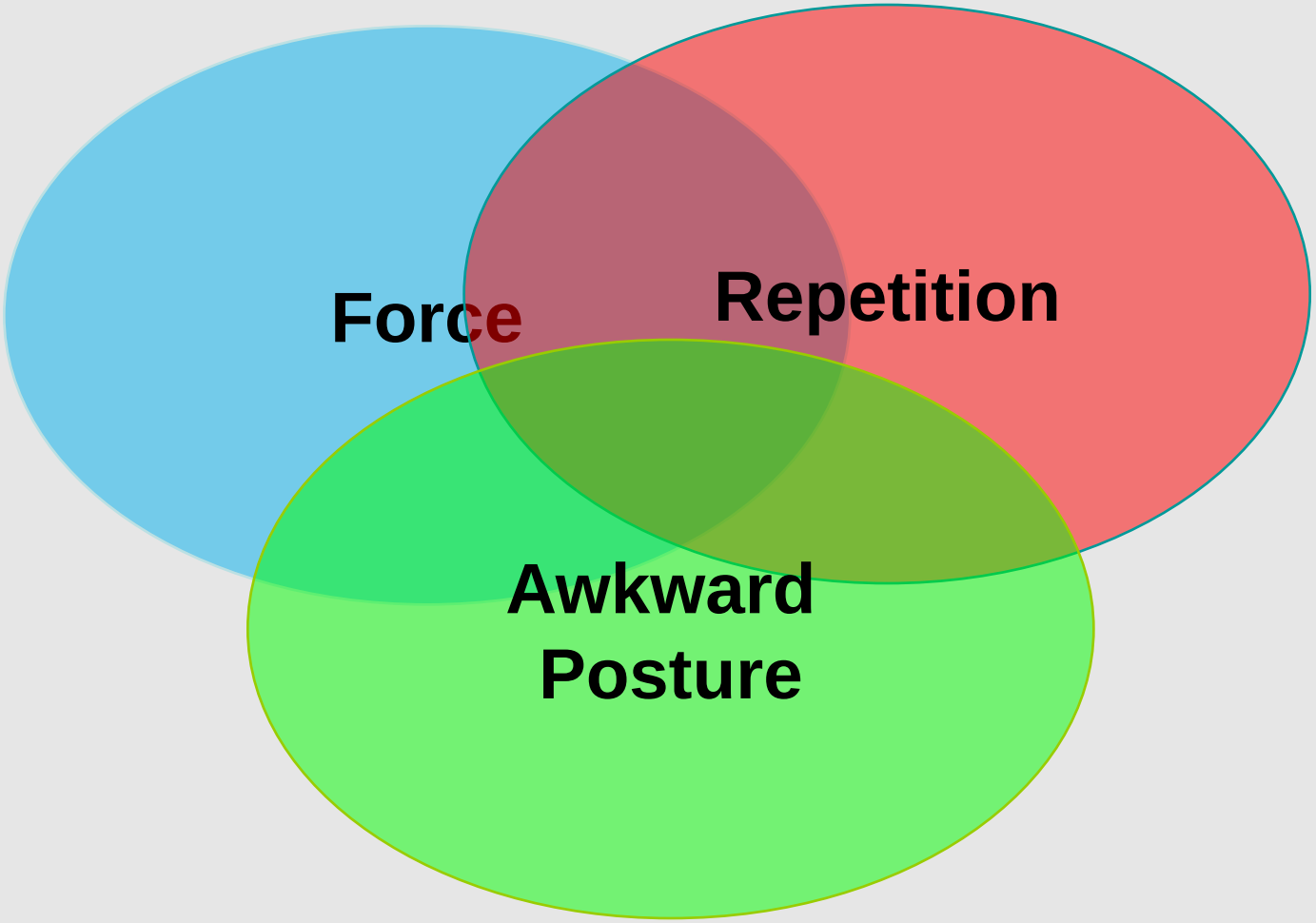
Awkward Postures are present when the body is not adopting a “neutral” position.

Static Postures are present when postures are held for prolonged lengths of time.

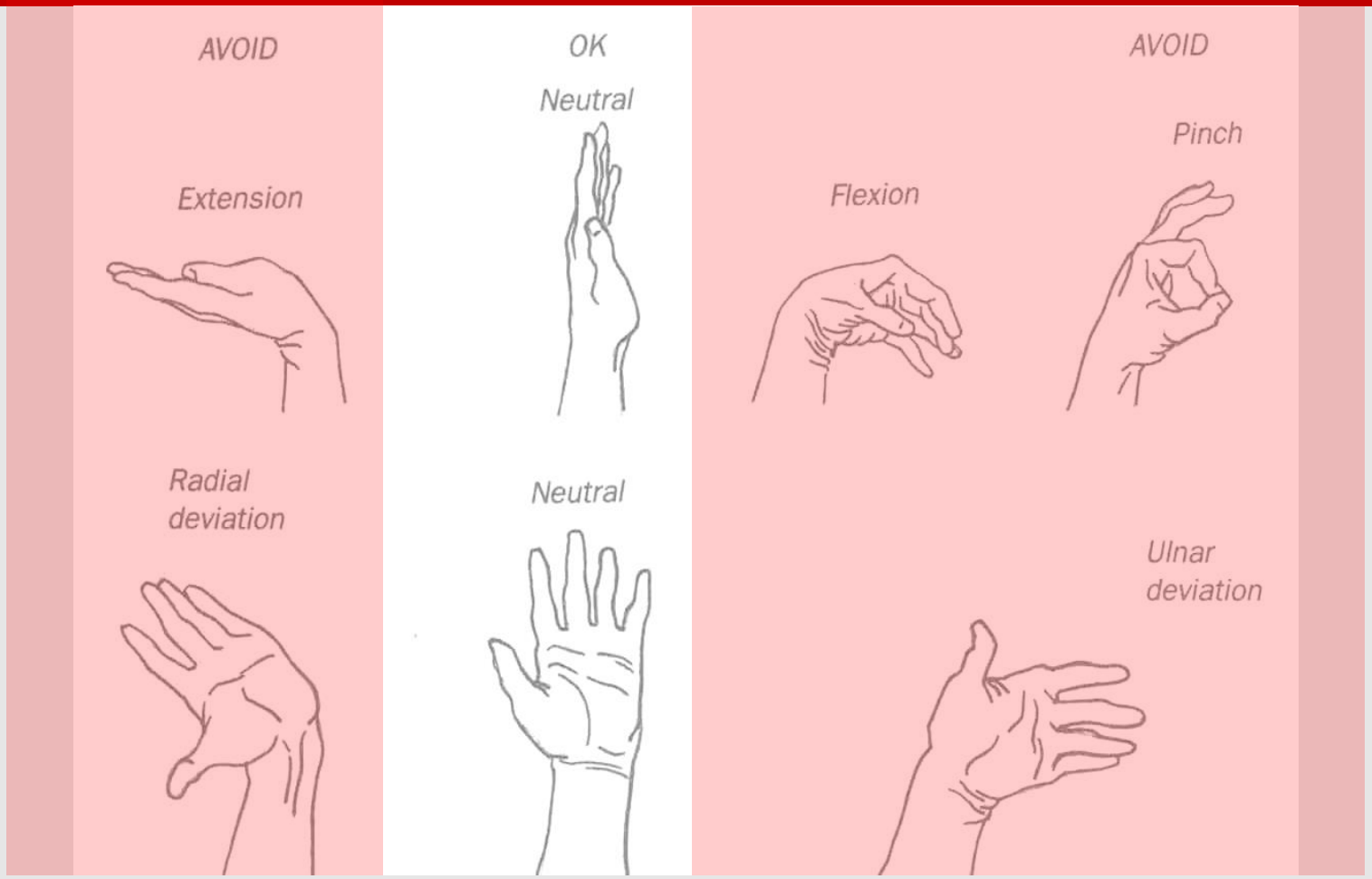
Exposure to awkward and often static postures in the office may occur when:

- Sitting
- Keying, mousing
- Talking on the phone

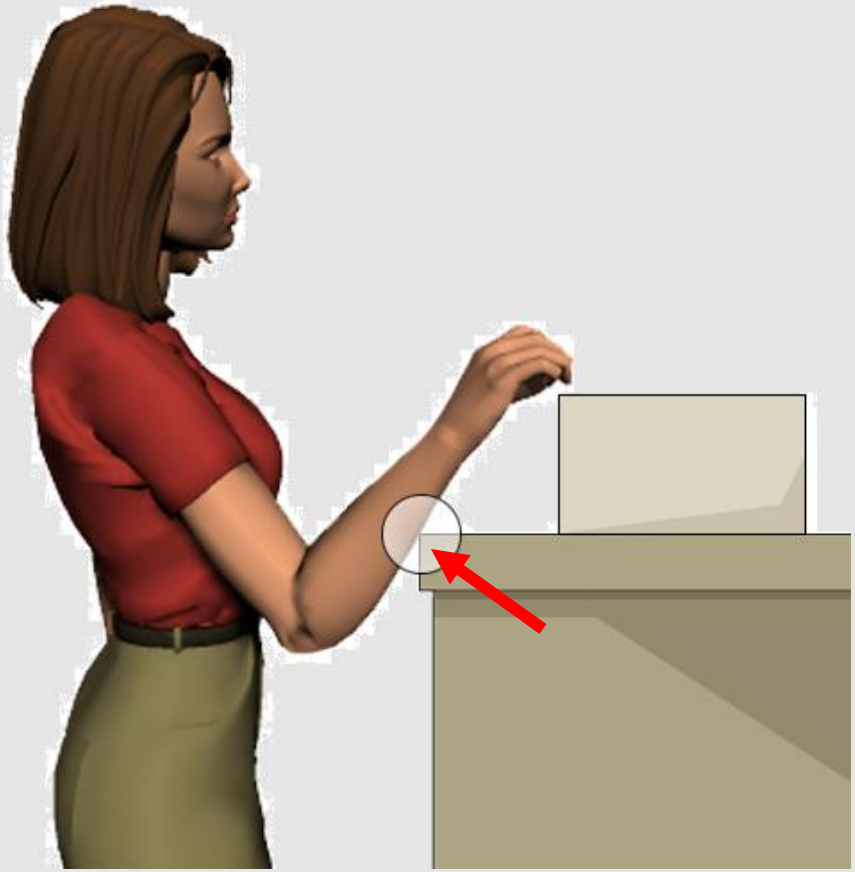
Risk Factors Are Additive /Multiplicative



Awkward Hand Postures



Contact Stress



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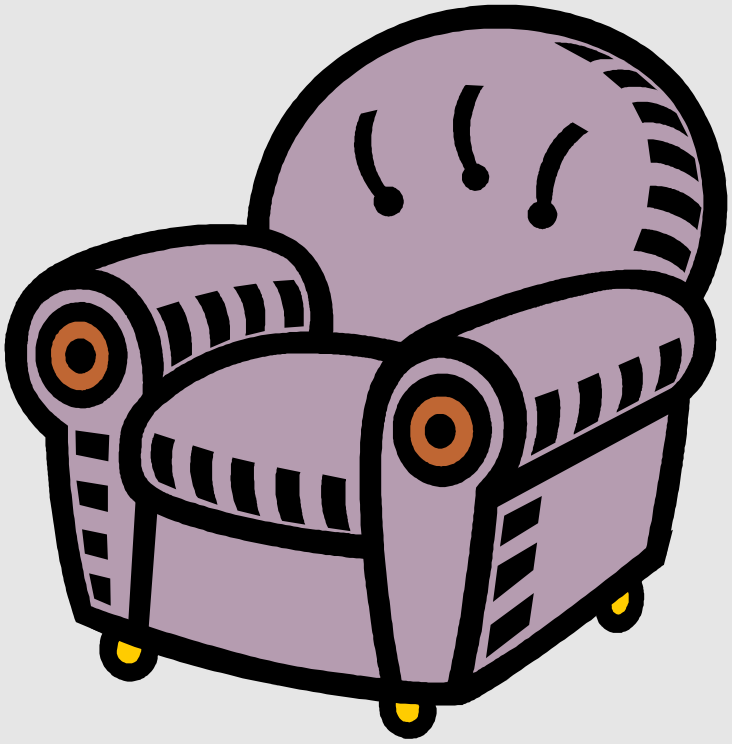
Your Chair



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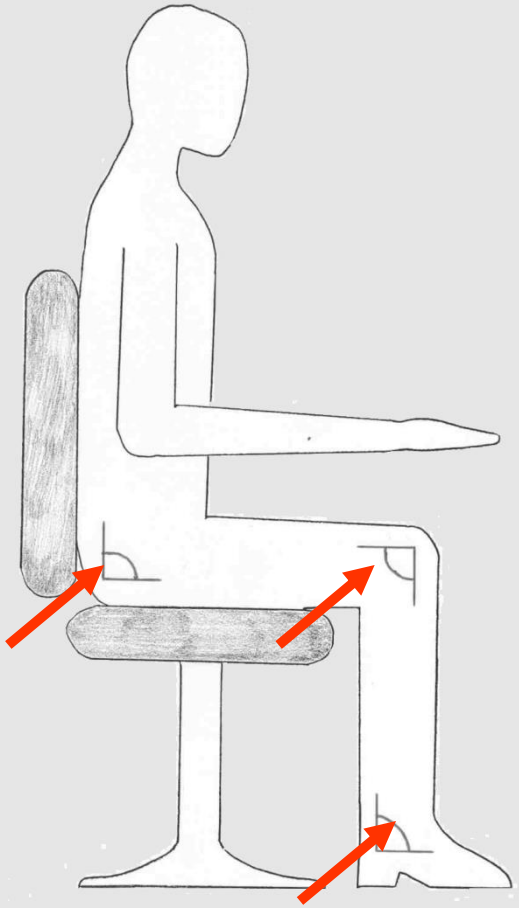
Angles to Consider

When setting up your chair



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Base of Chair

- 5 casters (more stable)
- Within circumference of seat pan
- For soft floors (carpet) – use hard casters
- For hard floor (tile) – use soft casters

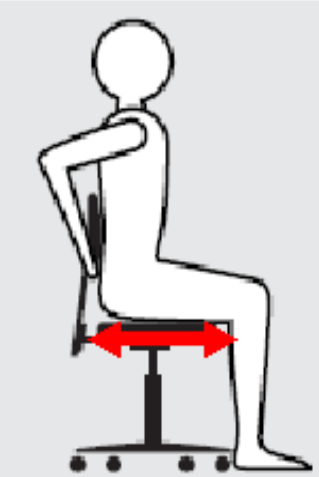
Seatpan of Chair

- **Rounded front edge (waterfall)**
  - **reduces chance of <u>contract stress</u> at back of knees or thighs**
- **Adjustable seat slope**
  - **forward or backward tilt**

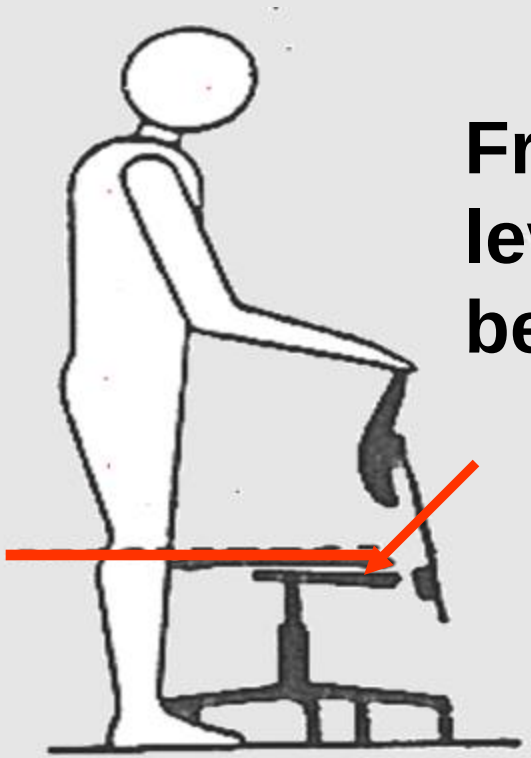
Seat pan

- Appropriate size
- “Fist” test (depth)
- Adjustable in angle (optional)

Buttock-to-Popliteal Length

Body Measurement	Compared With
Buttock-to-Popliteal Length: • Sitting erect, with feet flat on the floor so that the knees are bent at right angles. • Buttock-to-popliteal length is measured as the horizontal distance from the back of the buttock to the back of the knee. • This value defines the minimum seat depth for a chair to ensure that pressure on the underside of the thigh is not excessive.  Measure from the back of the employee's knee to the back of the buttock.	**Seat Depth** 

Adjusting Seatpan Height



Front of knees at level or slightly below hips

Too high – may restrict circulation

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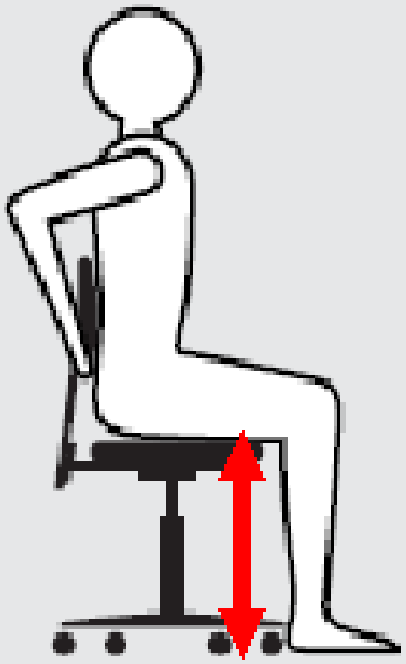
Popliteal Height (Sitting)

Popliteal Height (Sitting)

- Sitting erect, with feet flat on the floor so that the knees are bent at right angles.
- Measure the vertical distance from the floor to the underside of the closest to the knee.



Seat Height

Knee Height (Sitting)

Knee Height (Sitting)

- Sitting erect, with feet flat on the floor so that the knees are bent at right angles.
- The vertical distance from the floor to the top of the knee is measured.
- This measure is useful in the design of seated workplace heights.

Thigh Clearance

Backrest of Chair

- **Lumbar support that adjusts up and down**
- **Backrest that tilts forward & backward**

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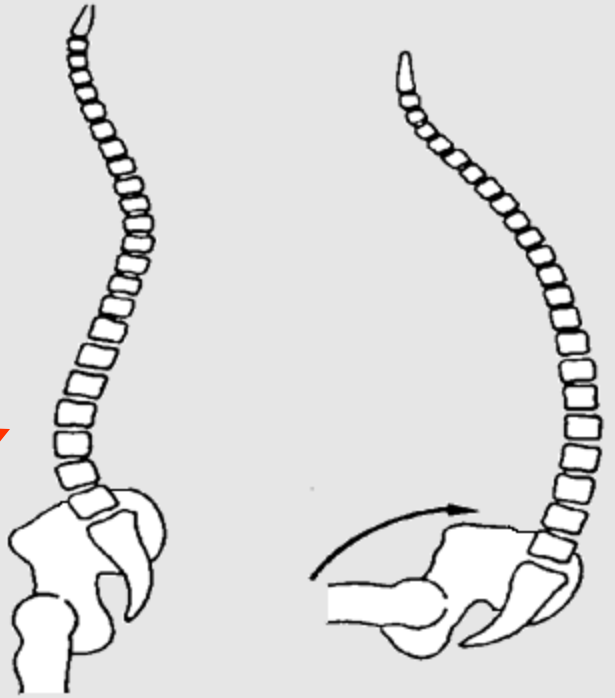
Need for Lumbar Support



S-curve standing

C-curve when sitting (unsupported)

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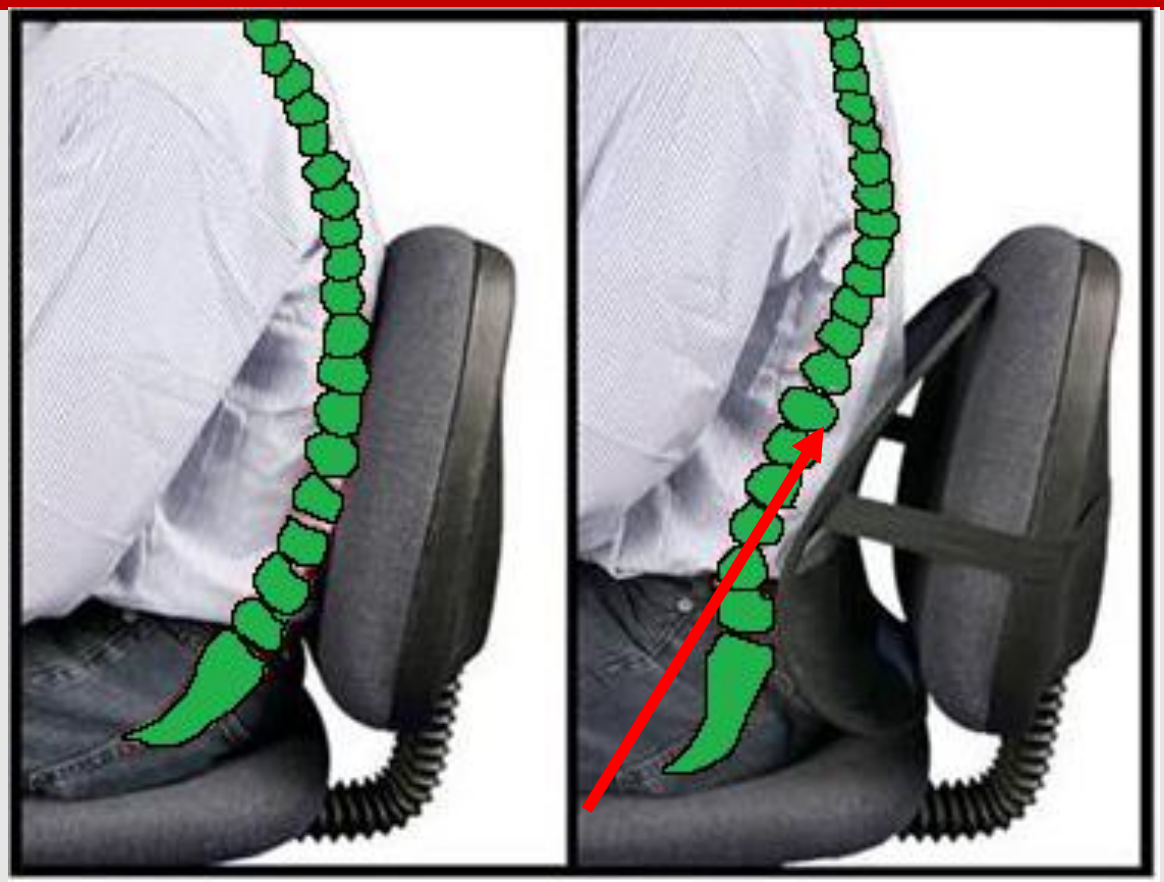
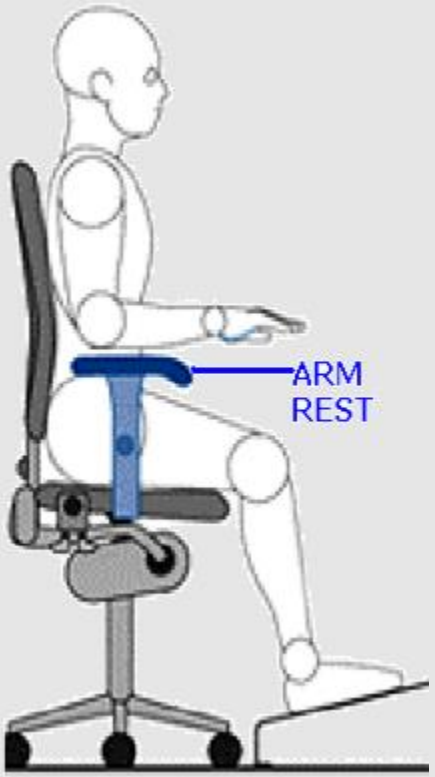
Need for Lumbar Support

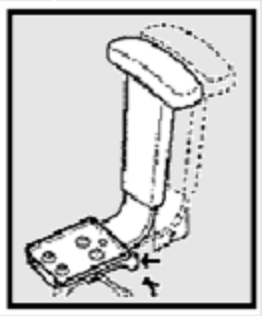


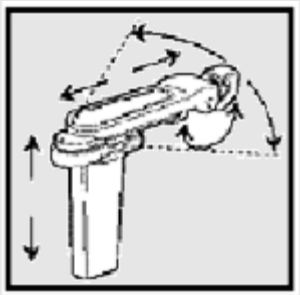
Lumbar support – helps to maintain S-curve

Armrests

- Allows shoulders to relax
  - Supports arm weight
  - Relieves neck tension
- Adjustable height
  - Width adjustability option
- Can be changed/removed



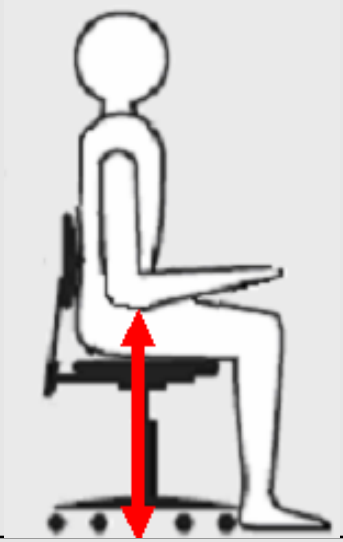




Elbow Height (Sitting)

Elbow Height (Sitting)

- Sitting erect, with feet flat on the floor so that the knees are bent at right angles.
- Relax shoulders.
- Flex elbows, forearms level with floor
- Measure from tip of elbow to floor.

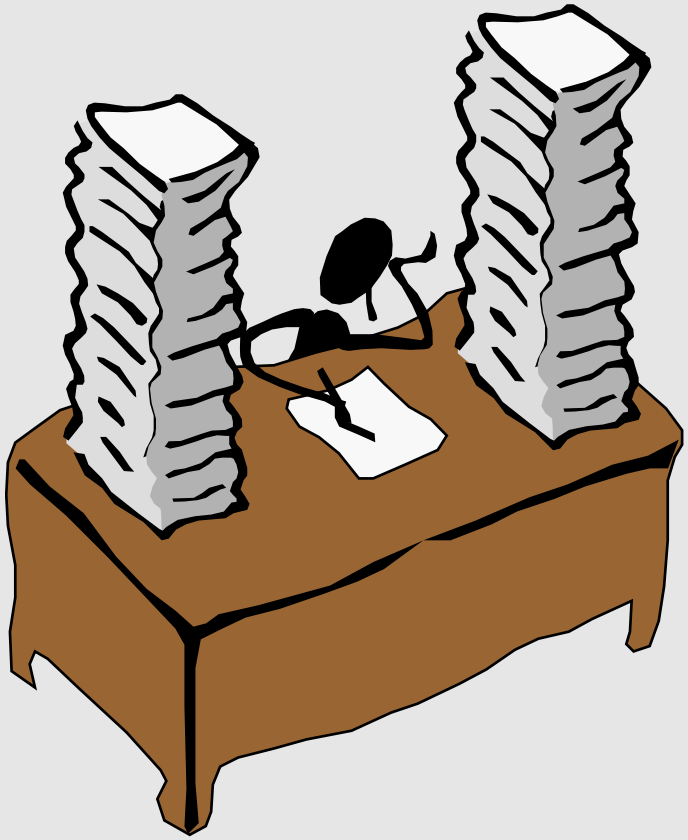


Desk Height
Mouse Height
Keyboard Height
Armrest Height

What About Exercise Balls

- Designed as a therapy tool not a sitting option
- Studies have found increase trunk movement, higher back muscle activation, increase discomfort under buttocks and thighs, tissue compression, and increased hip rotation
- Balls can roll from under a worker
- Offer no ergonomic features such as lumbar support, armrests, seat height

Your Desk



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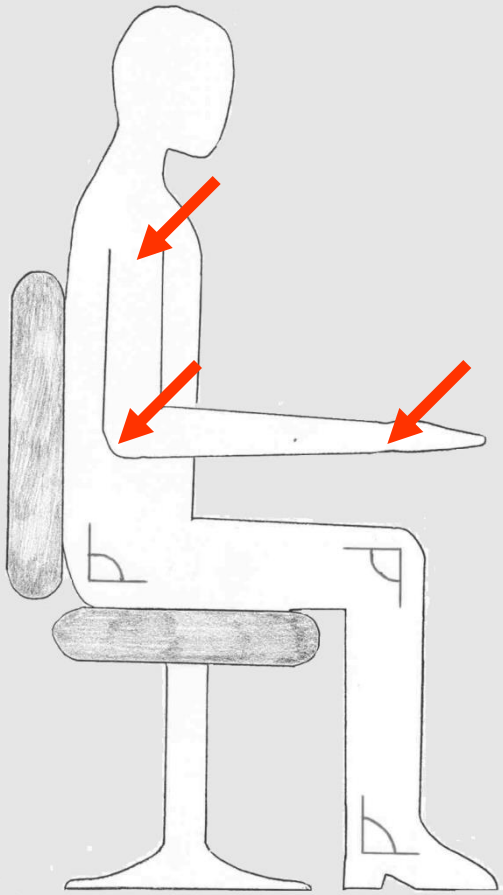
ANGLES TO CONSIDER

When evaluating the height of your desk



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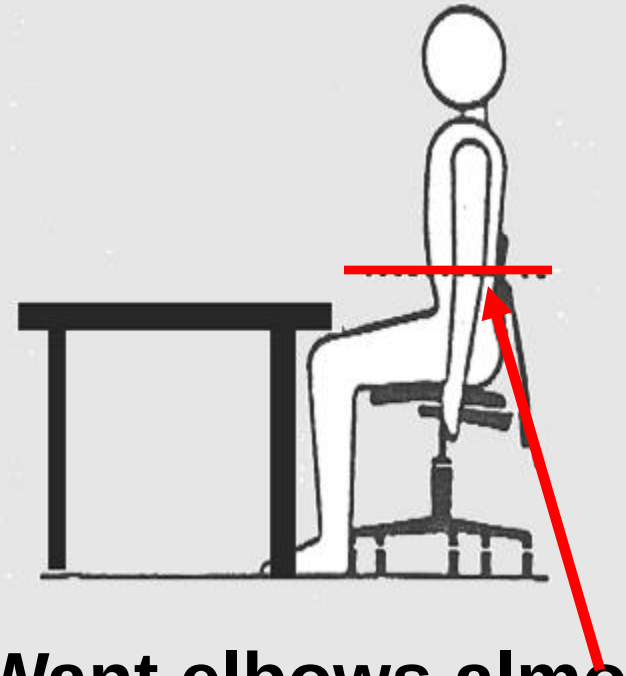
Height of Desk



- **Rounded leading edge (remember the contact stress?)**
- **Standard desk ~ 28 – 30 inches high**
- **Avoid excessive flexion of spine (desk too low)**

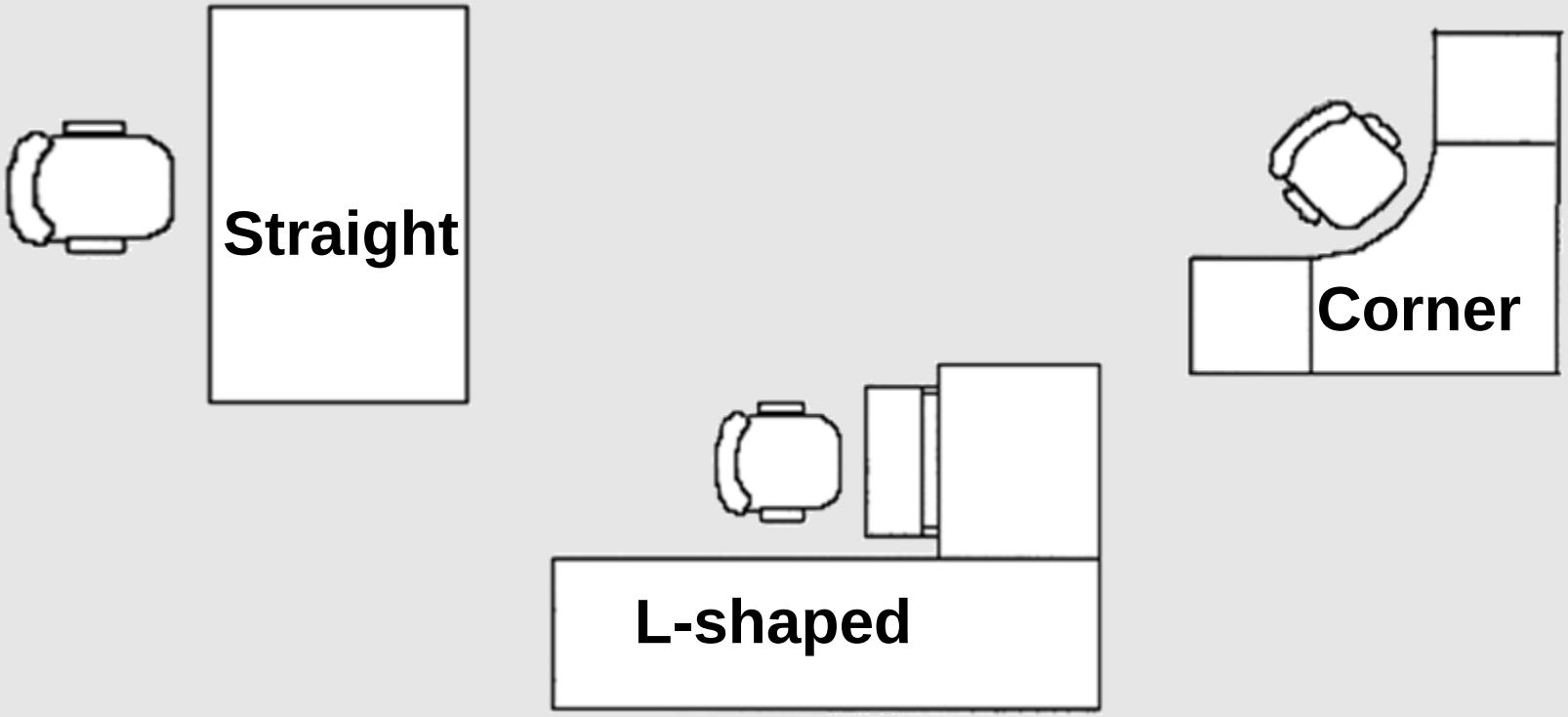
Want elbows almost level with desktop

- Too high: lower desk or use footrest

- Too low: raise desk or lower seat

Desk Designs

Positive & Negative aspects



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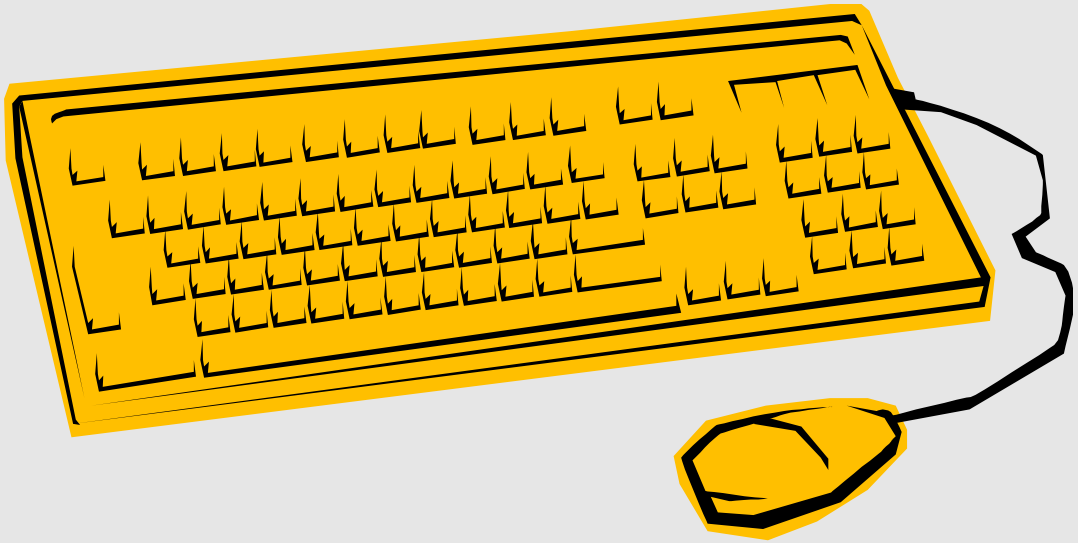
Your Keyboard



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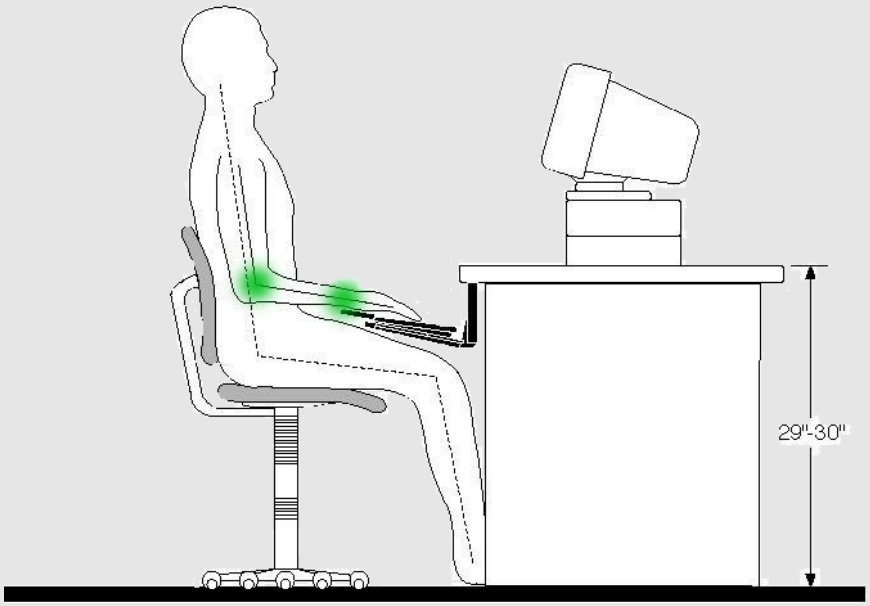
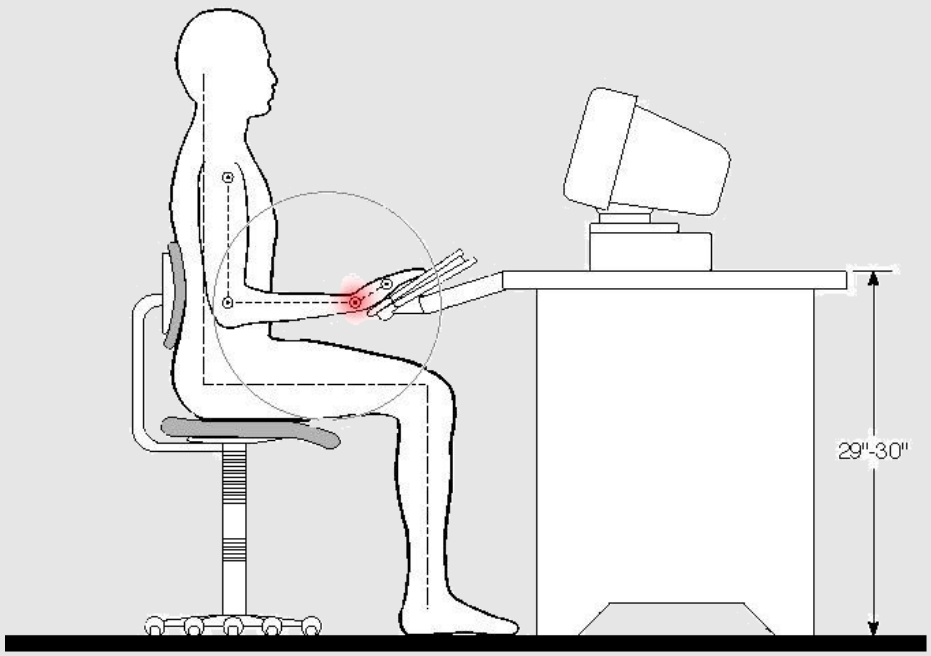
Height of Keyboard

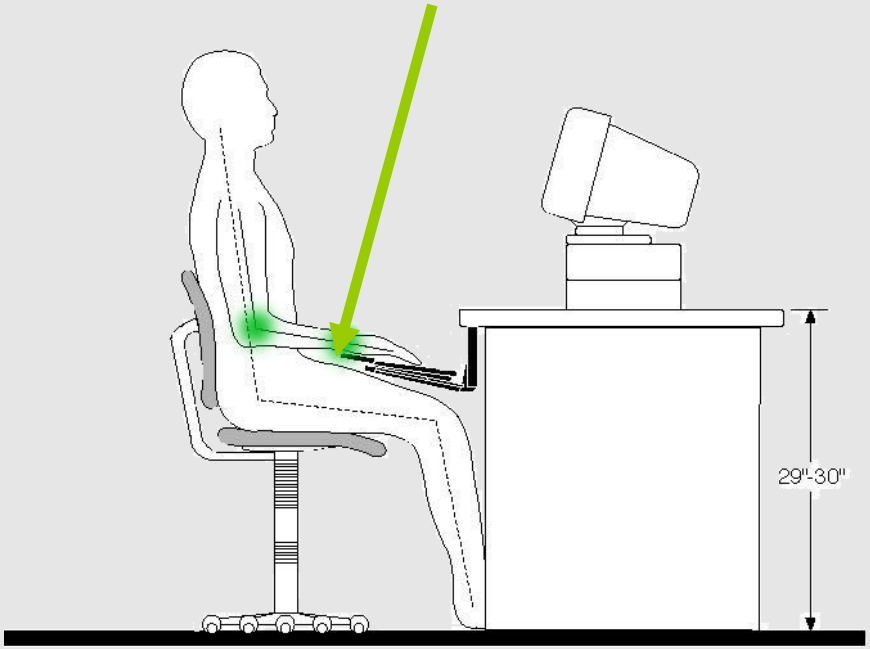


- **Want elbow joint at about 90 degrees with shoulder relaxed**
- **Some may feel more comfortable with elbow joint greater than 90 degrees**
- **Keep upper arms close to body**

Keyboard & Tray

Adjust tilt to keep wrists in a neutral position





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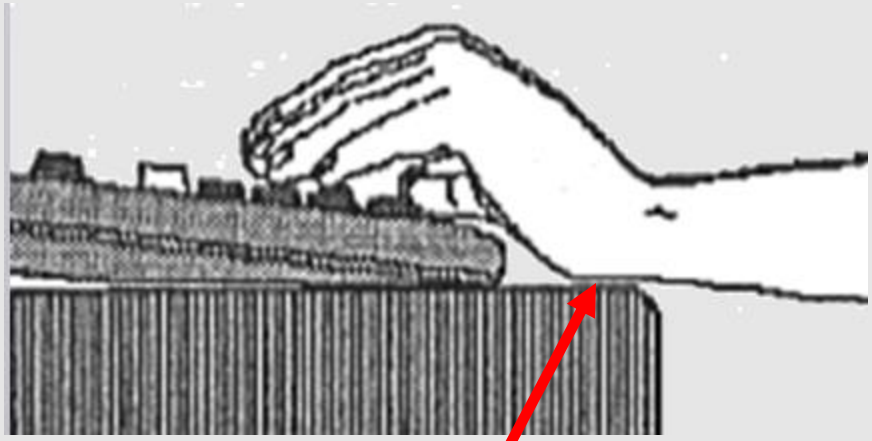
Keyboard Designs

Positive & Negative aspects

Promotes ulnar deviation **Only for touch typists**

Researcher commented:
With keyboard use, wrist extension may be more important in promoting injury than ulnar deviation.

Using a Wristrest



(Remember the contact stress?)

- Can reduce static load on neck & shoulder muscles (Remember the static work?)

- Ideally, only used during pauses when typing, but…

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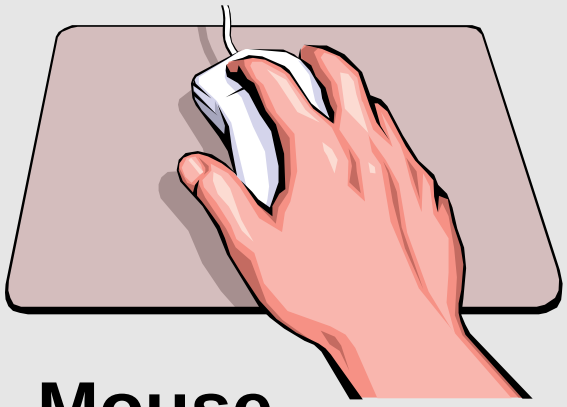
Input Devices



Mouse

Joystick

Trackball

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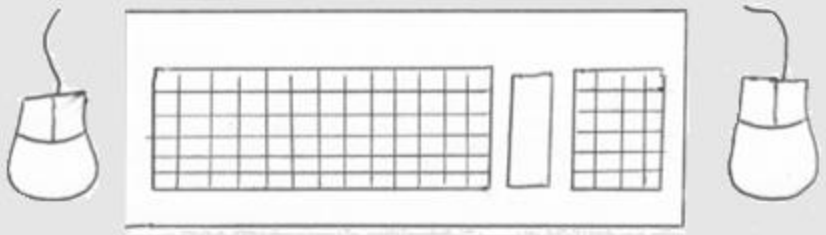
Location of Input Device

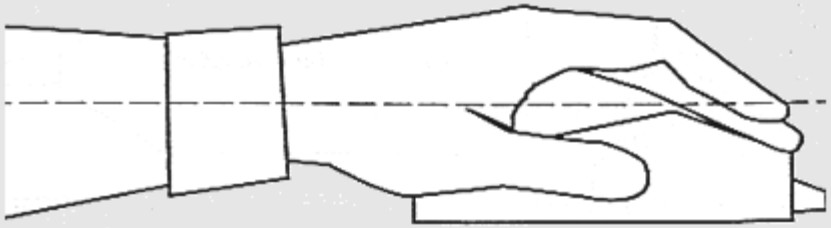
Close as possible to keyboard to limit arm reaches & at the same level as the keyboard

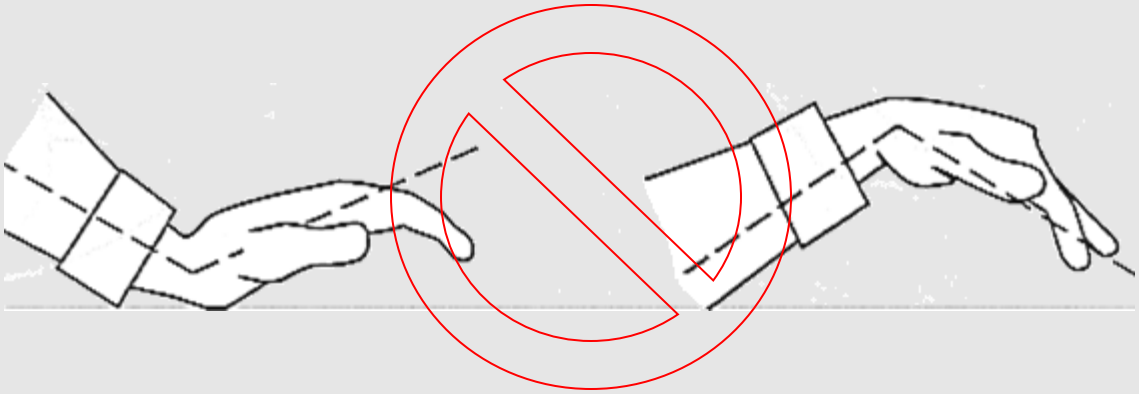


left **right**

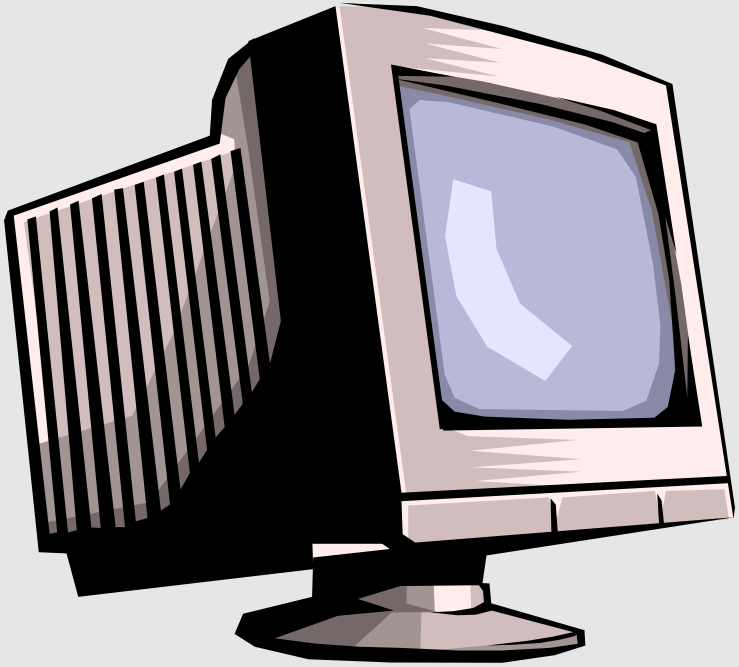
Input Device - Posture

Maintain a neutral wrist posture





Your Monitor



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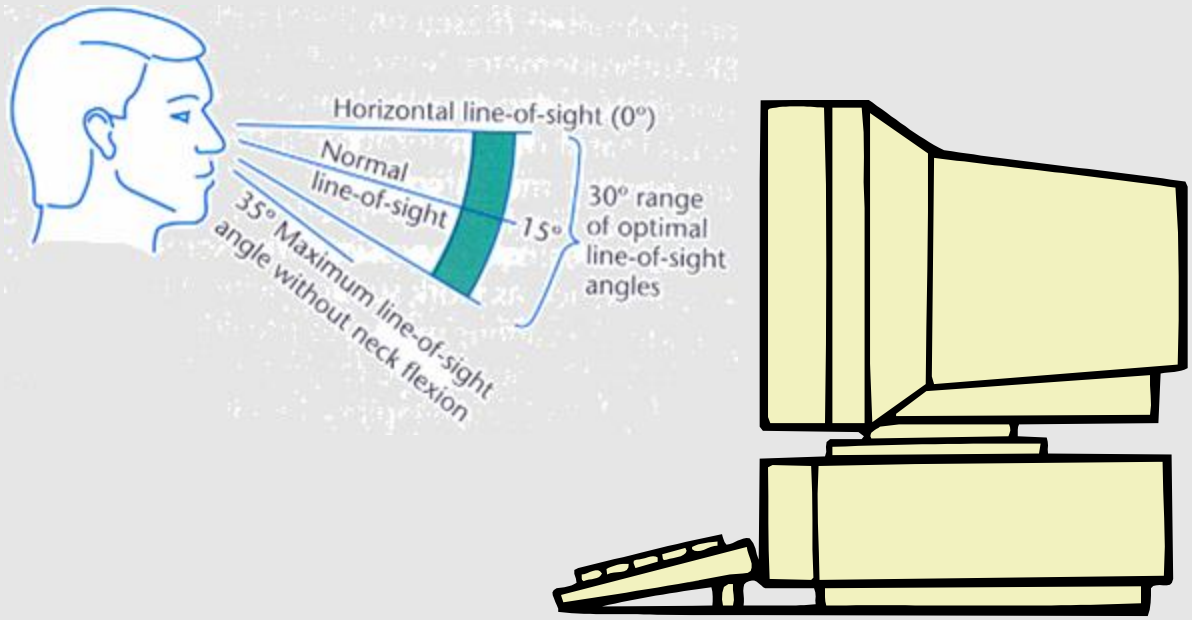
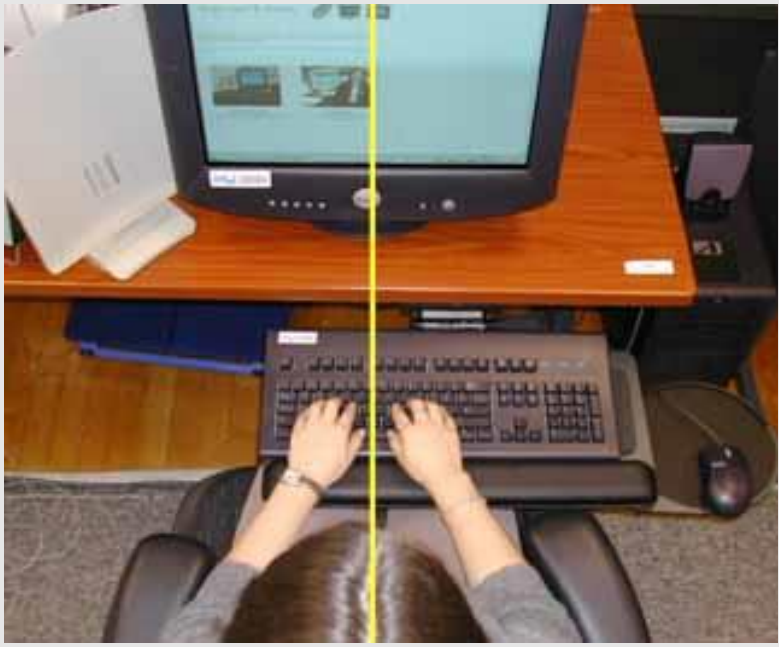
Location of Monitor



- **Top of monitor at eye level**
- **Arms length away – 18 to 29 inches**
- **Note: increasing font size will improve visibility**

Steps to properly adjusting your monitor for bifocal and trifocal wearers

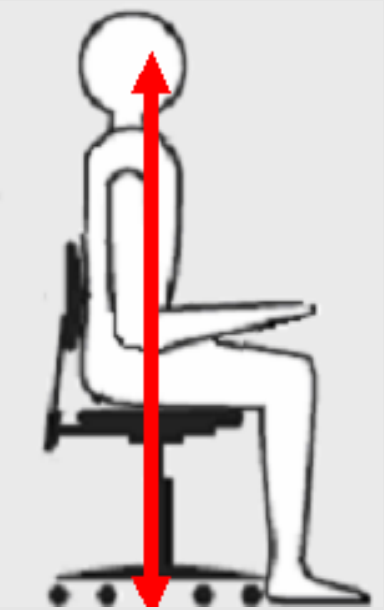
- The monitor will often need to be placed lower to achieve a neutral head and neck angle.
- Acquire computer lenses
- Acquire reverse bifocal lenses



Eye Height (Sitting)

Eye Height (Sitting)

- Sitting erect with the head level, and with feet resting on the floor so the knees are bent at right angles.
- Eye height is measured as the vertical distance from the floor to the eye.



Screen Height

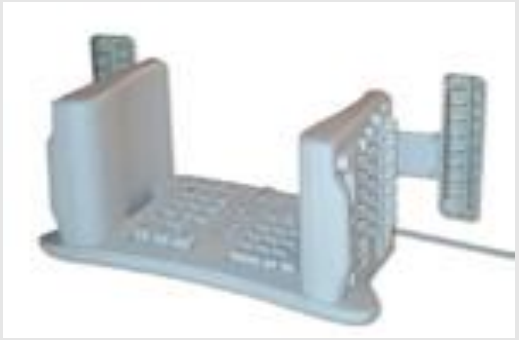
Document Holders

- Documents should be positioned within the central field of view
- placement should be to minimize postural fatigue caused by turning of neck

Once again, we're all different!

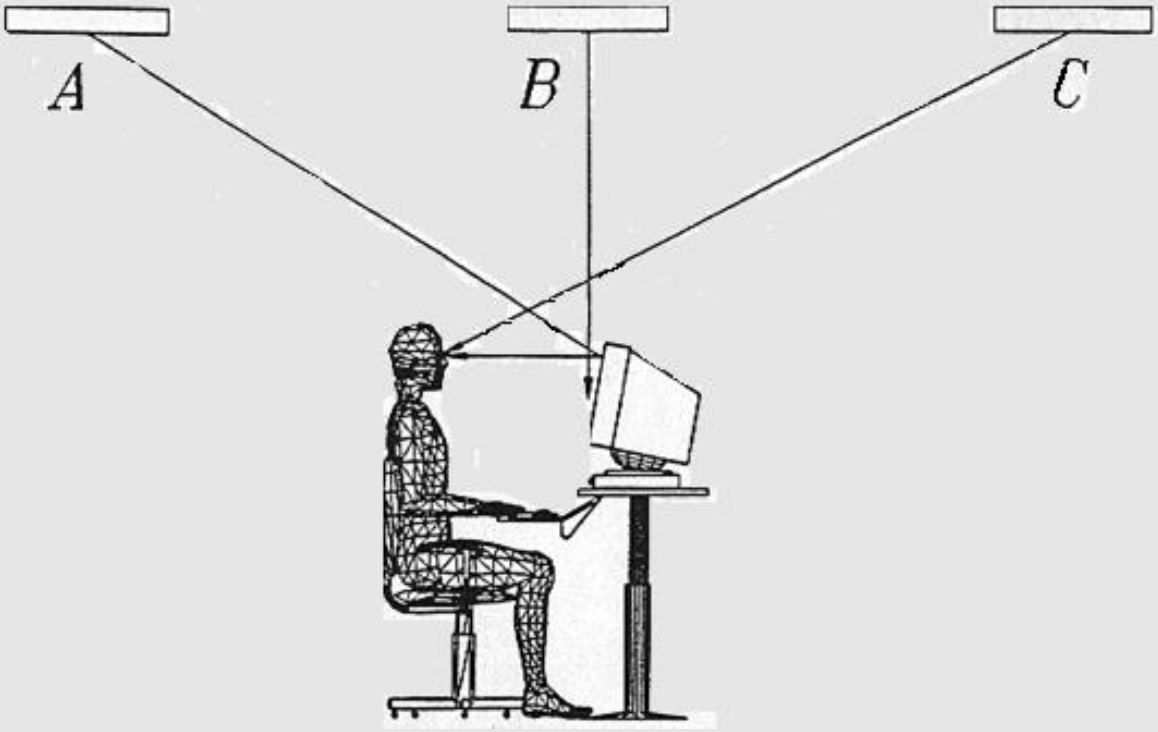
So we have keyboards for little fingers, big fingers, contoured, upright, one handed, and split. And these are just some examples.

So Find What Works for You!



Lighting

Try to eliminate all sources of glare



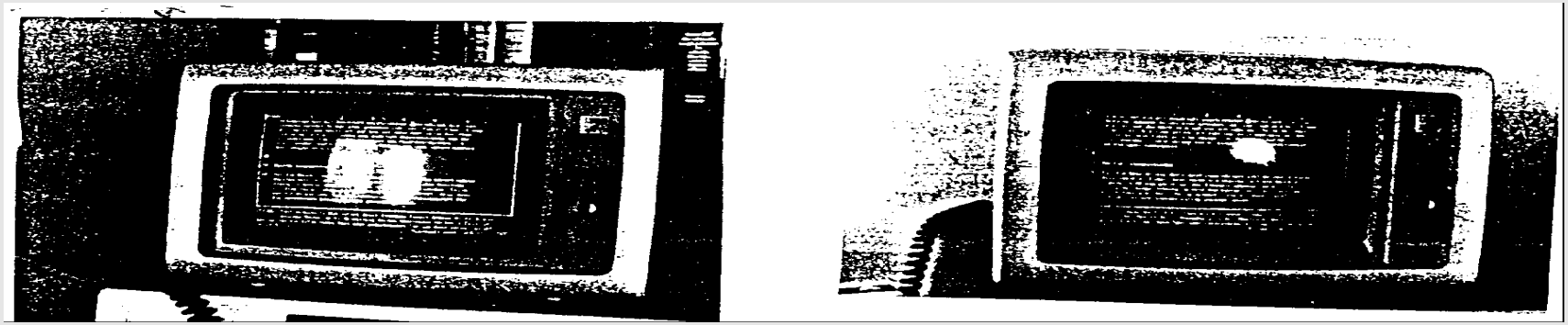
A. reflected glare

B. direct glare

C. direct glare

Types of Glare

- discomfort glare - occurs when glare source produces physical discomfort to the eyes such as headaches
- disability glare - which occurs when a glare source reduces the ability to see the viewed objects
- blinding glare - so intense that for a length of time after the source is removed, no object can be seen



Hints to Help you Reduce Glare

- Position your monitor parallel to windows and overhead lights
- dim overhead lights
- place filters (louvers) on overhead lights
- use blinds or curtains to control the level of natural light
- use an anti-glare screen on your monitor

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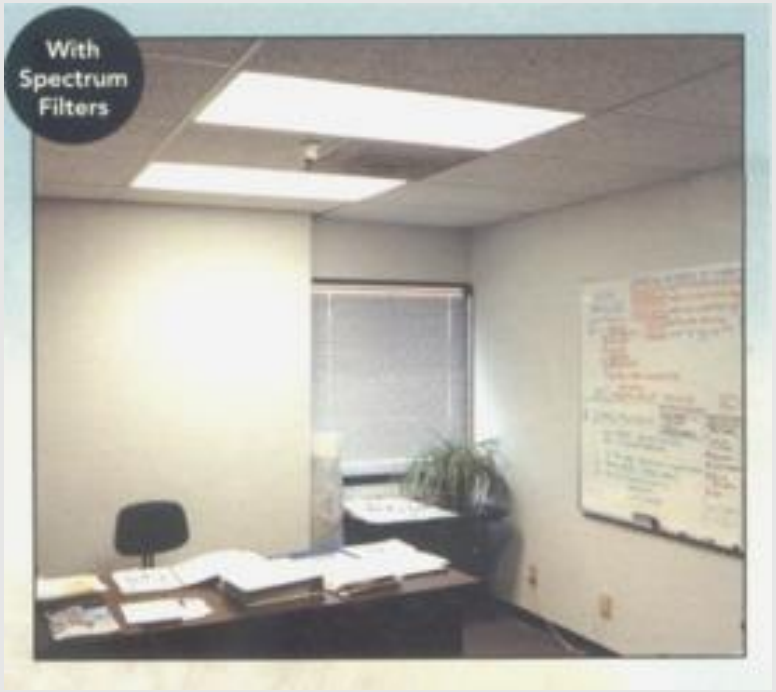
Filter Options:

Spectrum & Anti-glare

- Place filters on overhead lights



Noise

- Office noise can:
  - Be annoying and distracting
  - Interfere with communication
  - Cause stress
  - Increase rate of fa
  - Reduce productivity

Hints to Reduce Office Noise

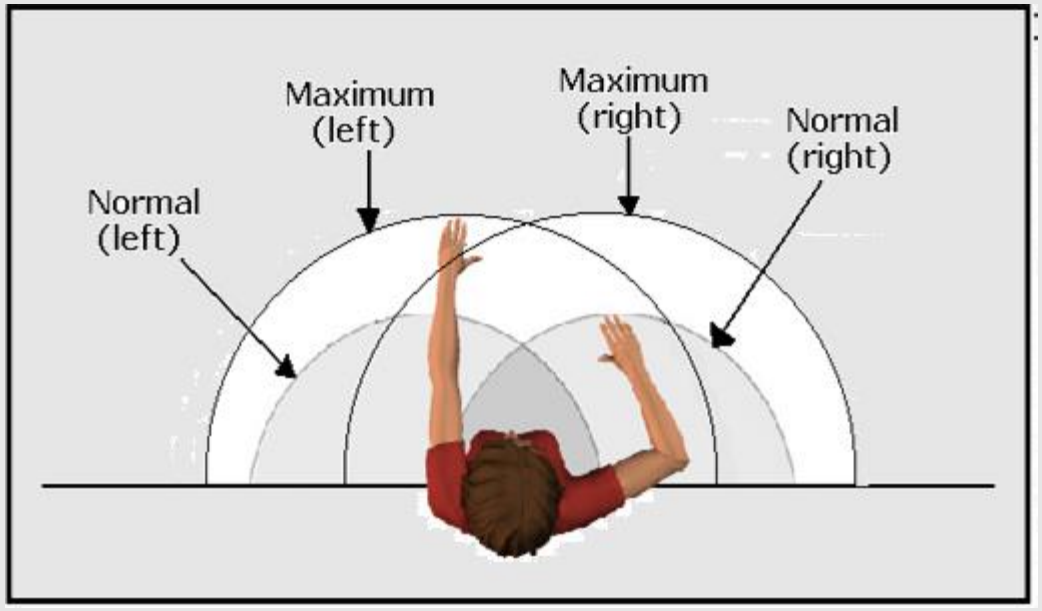
- Locate photocopiers and other loud office equipment in a separate room
- place noise hoods over loud equipment
- maintain equipment (printers, fax)
- use sound absorbing materials (carpets, curtain, ceiling tiles etc …)

Workplace Organization

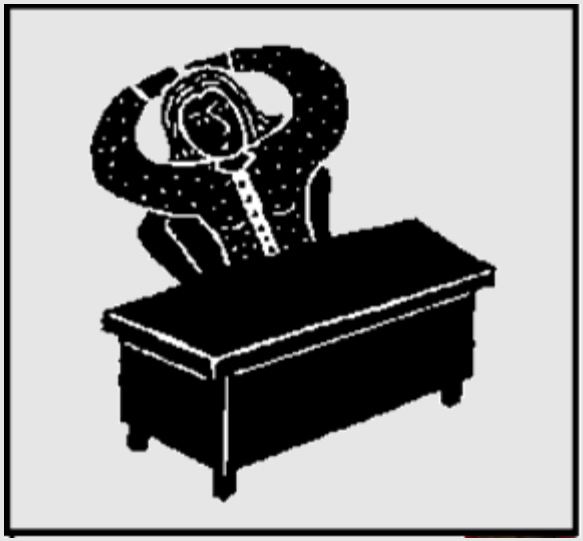
- Organize your work space to allow you to comfortably reach items which you use the most (try to avoid reaching across your body or bending and twisting)
- DO NOT store heavy items on top shelves or in bottom drawers
- use a headset if you spend a significant amount of time on the phone

Workplace Organization

- Minimize and avoid reaching across your body, bending and twisting
- Frequently used items should be within arms reach



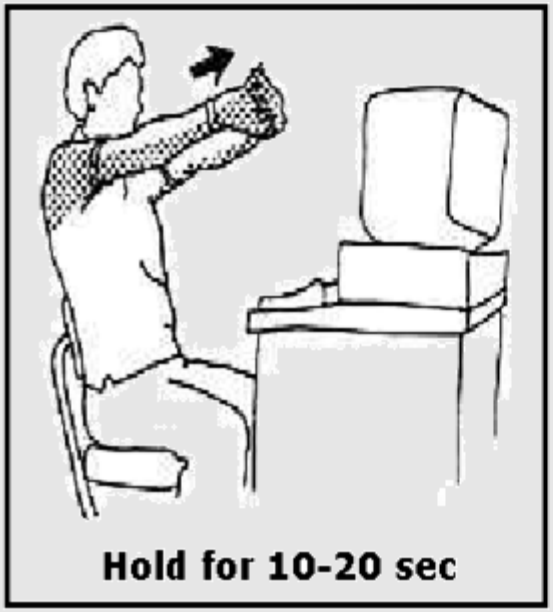
Micro Pauses and Rest Breaks



- BREAK IT UP!
  - MICRO breaks of 15-30 sec
- STAND UP!
  - 2 mins every ½ hour
- CHANGE IT UP!
  - Stand up when talking on the phone
  - Adjust you chair throughout the day

Exercises & Stretching

- Increase circulation
- Improve posture
- Decrease fatigue
- Reduce tension
- Hold 15-30s; 2-3X



Benefits of Physical Fitness

Reduce muscle tension

Improve circulation

Reduce anxiety, stress, and fatigue

Improve mental alertness

Decrease the risk of injury

Make your work easier

Tune your mind into your body

Make you feel better

Occupational Health Clinics for Ontario Workers Inc.
Centres de santé des travailleurs (ses) de l'Ontario Inc.

How to Avoid Injury in the Office

- Properly set-up your office equipment (chair adjustment, minimize far reaches)
- Maintain neutral working postures
- Take breaks, move frequently
- Keep stress under control!
- Have a comfortable environment (noise, lighting…)

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Finally,

- **Be aware of early warning signs:**
  - **neck stiffness or tightness**
  - **shoulder stiffness or tightness**
  - **hand cramping**
  - **muscle fatigue**
- **Do not ignore these - rest, examine design of workstation and modify as needed.**

Take Home Message

- Adjust your workstation to fit YOU
- change your posture during the day
- remember to micro pauses
- break every 5 minutes for every 1 hour
- stretch/exercise
- DO NOT ignore early warning signs of musculoskeletal injury

Thank you for your attention

Thank you for your attention.

If you have any questions about ergonomics or any other occupational health concern contact OHCOW at:

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