

# OFFICE ERGONOMICS

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APHIS ERGONOMICS

**Work Healthy**



2012

# Ergonomics

- Definition: Fitting the job to the worker.
  
- Goals:
  - Work in neutral postures.
  
  - Seeks to improve the interaction between humans and the machines & tools they use to perform their work.
  
  - Decrease risk of injury/illness.
  
  - Enhance worker productivity.
  
  - Improve quality of work life.

# What You Will Learn

- General tips to reduce your risk for work-related musculoskeletal disorders.
- Workstation set-up.
- Office exercises.
- How to obtain assistive technology.

# Question?

- What types of job tasks do you perform?
  
- Do these job tasks place your body in uncomfortable positions?

# Ergonomic Disorders and Injuries

The absence of a sound ergonomics workplace environment can lead to a variety of physical ailments named work-related musculoskeletal disorders (WMSDs), cumulative trauma disorders (CTDs), or repetitive strain injuries (RSIs).

# WMSDs, CTDs, and RSIs

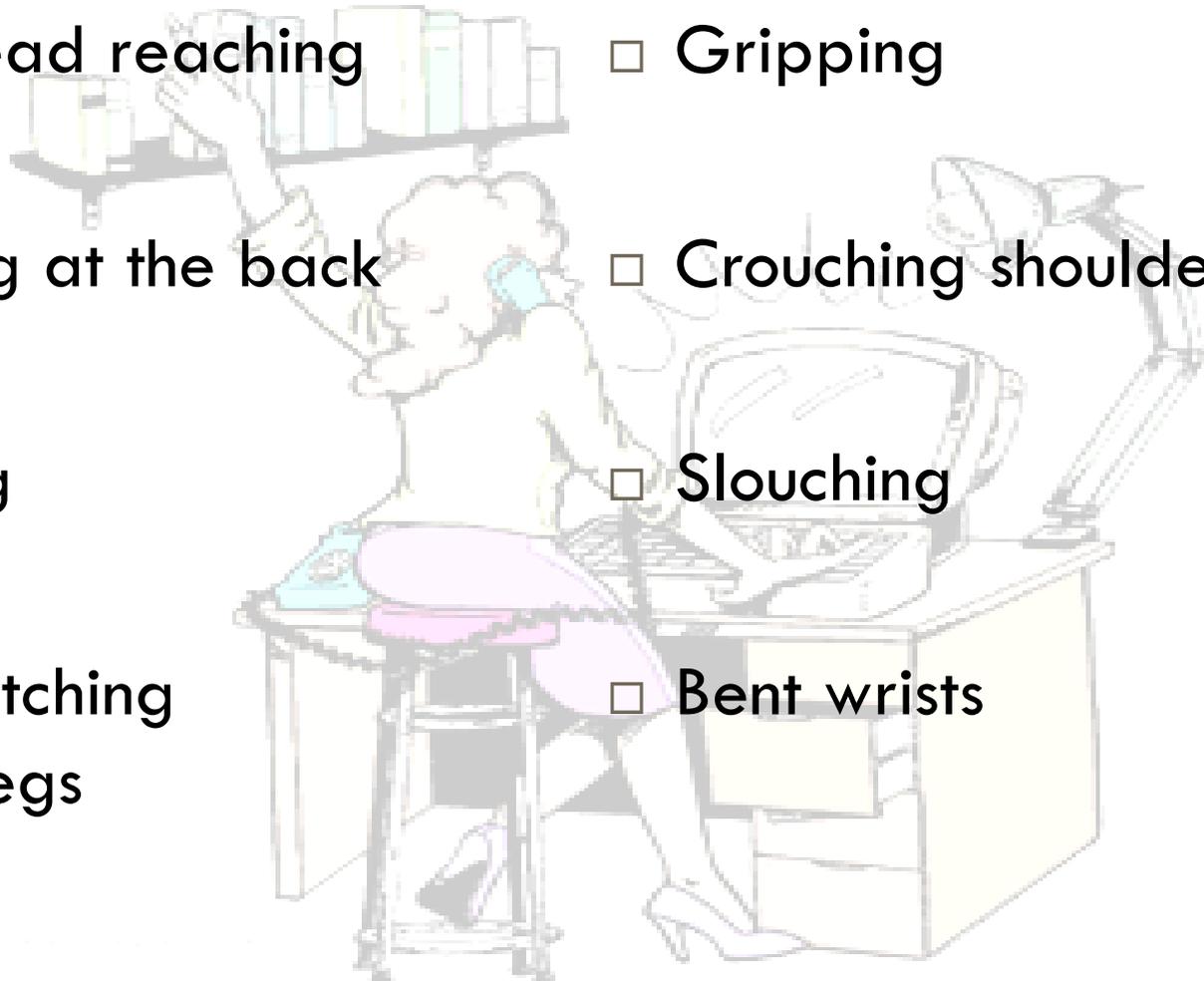
- Disorders of the muscles, joints, nerves, tendons, ligaments, cartilage, or spinal discs.
- Mainly occur in the neck, back, arms, and wrists.
- Reflect gradual or chronic development.

# Causes of WMSDs

- Awkward/Deviated Postures
  - Cradling the telephone between the neck & shoulder
  - Viewing the monitor off-center
  
- Highly Repetitive Work
  - Keyboarding
  - Lifting
  
- Excessive Force
  - Stapling
  - Mousing

# Awkward Postures

- Overhead reaching
- Bending at the back
- Twisting
- Outstretching arms/legs
- Gripping
- Crouching shoulders
- Slouching
- Bent wrists



# Most Common WMSDs

- Lower Back Pain
  - ▣ Back Injuries Cost - \$125K per incident
- Carpal Tunnel Syndrome (CTS)
  - ▣ CTS Injuries Cost - \$30K per incident

# WMSDs – Lower Back Injuries

## □ Causes

- Lifting/moving heavy objects.
- Twisting.
- Standing for lengthy periods.

## □ Symptoms

- Pain.
- Tightness.
- Sitting is uncomfortable.



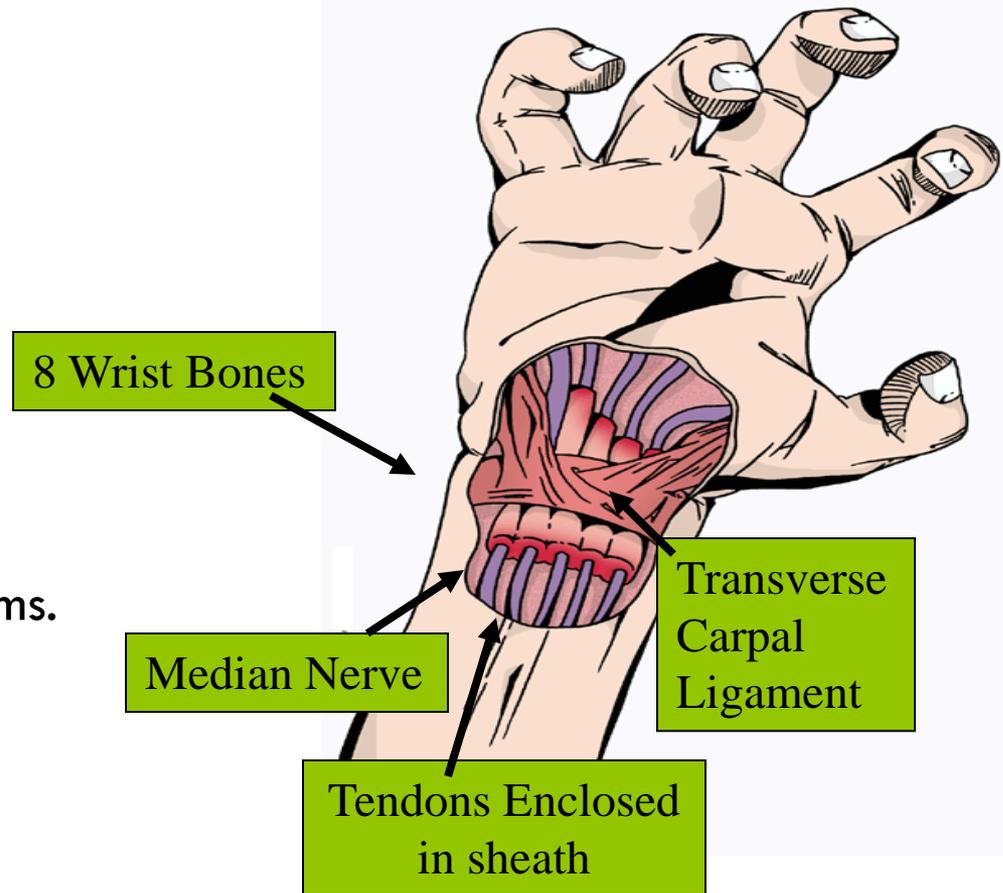
# WMSDs - CTS

## □ Causes:

- Poor wrist posture.
- Repetitive motions.

## □ Symptoms:

- Pain.
- Numbness & tingling in hands.
- Frequently dropping items.
- Decreased sensation.



# Other WMSDs

- Tendonitis
  - ▣ **Causes:** repetitive & forceful hand & wrist motions, awkward wrist position.
  - ▣ **Symptoms:** pain & swelling of the hands & wrists – at the site of the affected tendon.
  
- Trigger Finger
  - ▣ **Causes:** repeatedly using the index finger, forceful gripping of tools that have hard or sharp edges on their handles.
  - ▣ **Symptoms:** difficulty moving finger; snapping & jerking movements.

# More WMSDs

- Rotator Cuff Tendonitis
  - ▣ **Causes:** elevation of the arm.
  - ▣ **Symptoms:** shoulder pain, sometimes radiating down the arm.
  
- Thoracic Outlet Syndrome
  - ▣ **Causes:** postural changes, especially arm elevation.
  - ▣ **Symptoms:** neck pain, arm weakness & numbness extending along the inner forearm into the medial two fingers.

# Review

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Do you recognize any of the aforementioned causes of WMSDs in your work environment or job functions?

# Office Ergonomics



# Office Ergonomic Elements

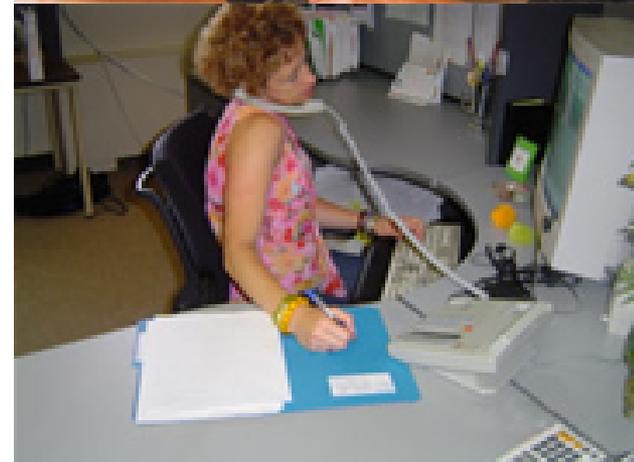
- Desk/Workstation
- Chair
- Keyboard
- Mouse, Trackball, or Other Pointing Device
- Monitor
- Lighting
- Laptop Computer
- Work Habits

# Desk/Workstation

- Standard furniture cannot accommodate everyone's needs.
- Organize the desktop so that frequently used objects are close to the user.
- Add a keyboard tray if a fixed-height desk is used.

# Desk/Workstation

- ❑ Place document holders between monitor and keyboard.
- ❑ Use a footrest if feet do not rest flat on the floor.
- ❑ Clear area underneath the desk to accommodate legs and allow for stretching.
- ❑ Use a headset or speaker phone to avoid neck and shoulder discomfort for frequent phone usage.



# Ergonomic Chairs



# Ergonomic Chairs

- A properly designed & adjusted chair will provide appropriate support to the back, legs, buttocks, and arms.
- Contact stress, overexertion, and fatigue may be reduced.
- Proper circulation is promoted to the extremities.

# Ergonomic Chair Features

- Chair Height
  - Do feet rest flat on floor or on a footrest?
- Chair Recline or Tilt
- Lumbar Support
  - Height adjustable.
  - Firm?
- Seatpan Depth
- Armrests
  - Height and width adjustable arms are a must.



# Seatpan Depth – Supports our weight!

Seatpan too long



Seatpan too short



Seatpan at right depth

# Lumbar Support – Do they have adequate support?



# Ergonomic Chair Resources

- APHIS Ergonomics Program Webpage – Recommended Equipment: [http://www.aphis.usda.gov/mrpbs/emssd/recommended\\_equipment.shtml](http://www.aphis.usda.gov/mrpbs/emssd/recommended_equipment.shtml)
- BodyBilt: [www.ergogenesis.com](http://www.ergogenesis.com)
- Herman Miller: [www.hermanmiller.com](http://www.hermanmiller.com)
- Neutral Posture: [www.neutralposture.com](http://www.neutralposture.com)
- Steelcase: [www.steelcase.com](http://www.steelcase.com)
- UNICOR: [www.unicor.gov](http://www.unicor.gov)

**\*A successful chair trial is recommended before purchasing.**

# Keyboards



**Natural Keyboard**

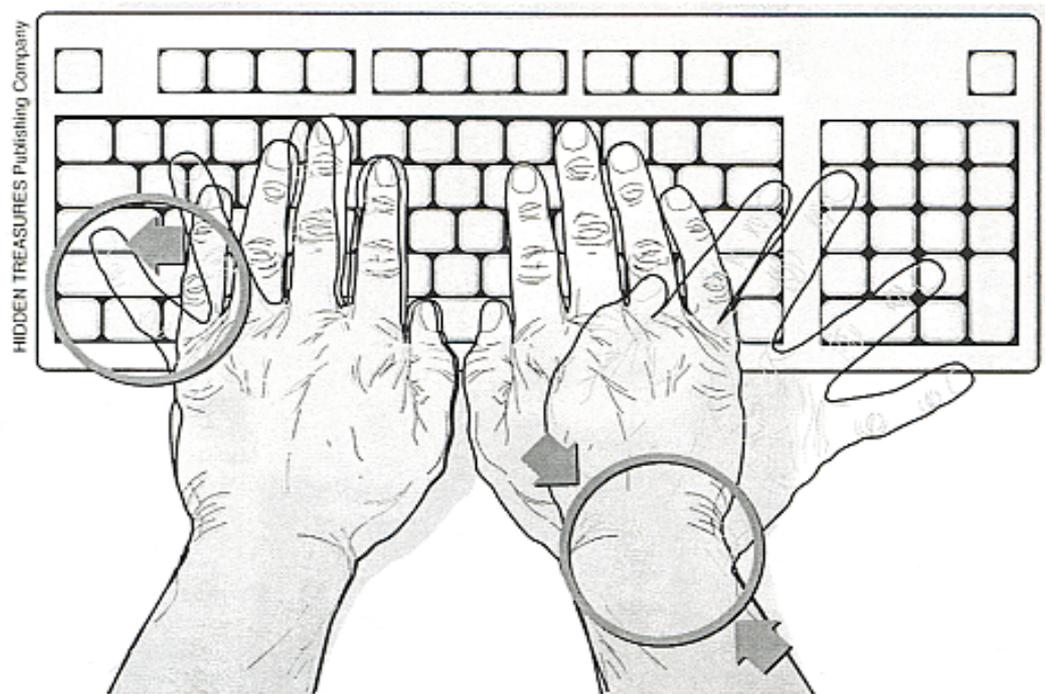


**Split Keyboard**



**Scooped Keyboard**

# Deviating from Body's Midline



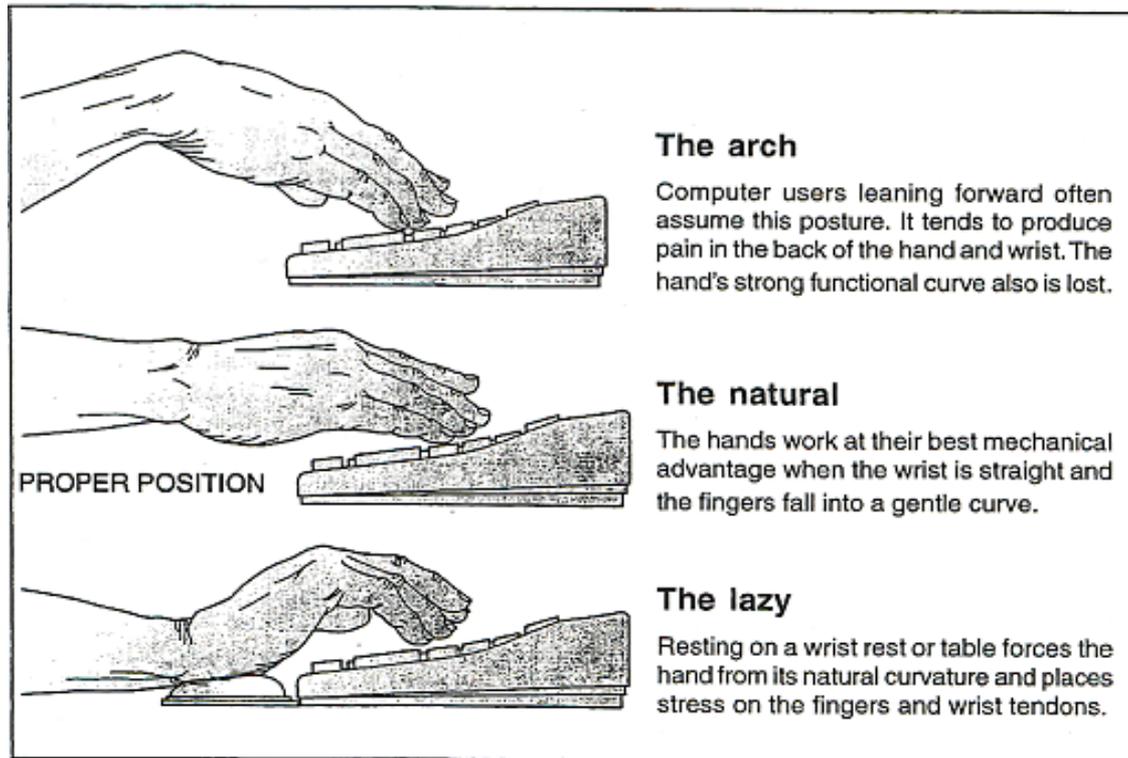
# Keyboard Height

- Adjust the keyboard height so that you have approximately a 90 to 120 degree angle in the elbow.
- You should be able to relax your shoulders and allow your arms to rest at your sides.
- Your forearms should be approximately parallel to the floor while keyboarding (i.e. just above your lap).
- Position the keyboard close to the you.

# Keyboard Tilt

- The keyboard should be lying flat or slightly titled away (e.g., negative tilt) from you.
- Your wrists should be in a neutral position while keyboarding.
  - The wrists should be flat or have a slight extension.
  - The wrists should not be excessively deviated towards the midline of the body or away from the midline of the body.

# Wrist Postures



# Keyboard Tilt



# Keyboard Usage

- Use soft, easy key strokes.
- Rest hands on a palm support or in lap during rest pauses.
- Avoid resting wrists on hard/sharp surfaces/edges while keyboarding or using the mouse.

# Palm Supports vs. Wrist Rests



# Adjustable Keyboard Trays

Consider an adjustable keyboard tray with an articulating arm and mouse extension.



# Mice



# Mouse Placement

- The input device (e.g., mouse, trackball) should be located adjacent to and at the same height as the keyboard.
- You should be able to rest your forearm on the desk without excessive reaching.
- The angle between the your arm and ribs should be less than 45 degrees.

# Mouse Placement – Good or Bad?

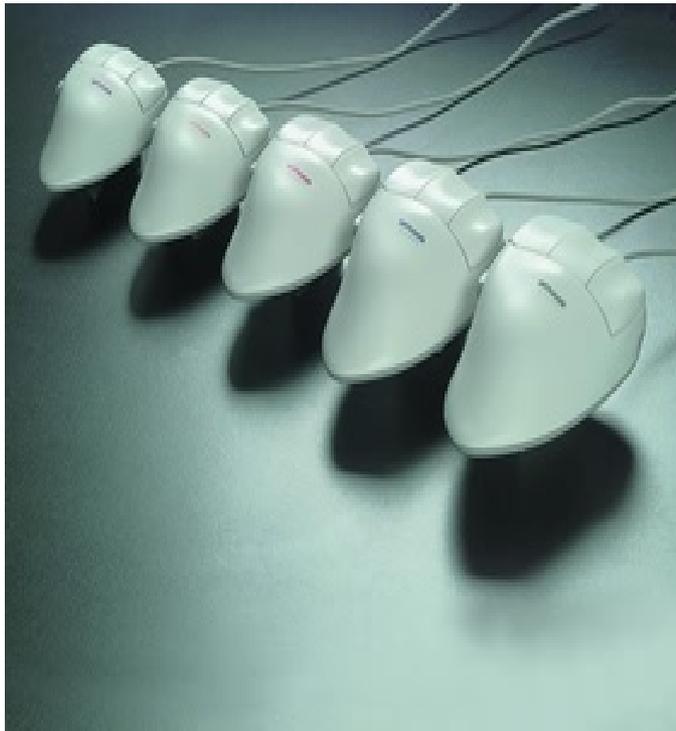


# Keyboard/Mouse

## Touchpad Keyboard



# Standard Input Devices



# Trackballs



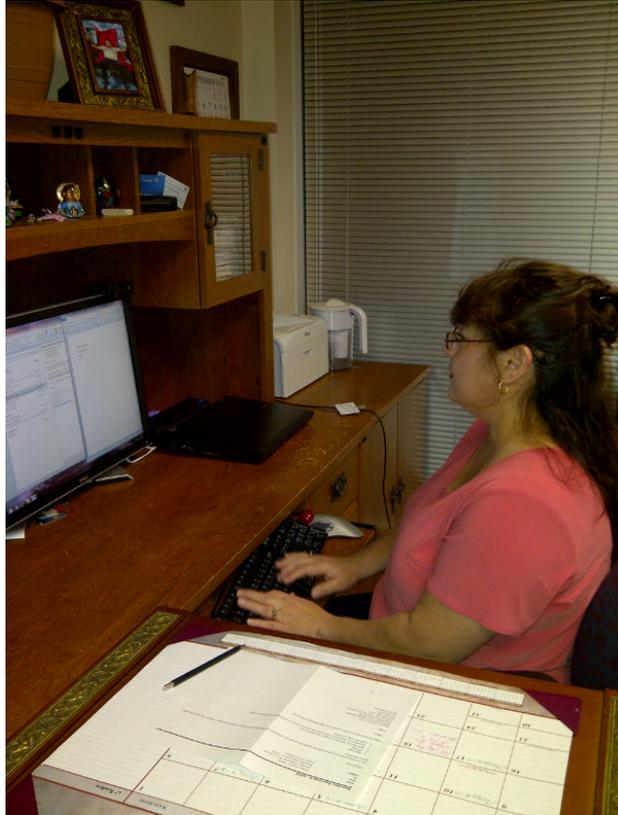
# Rollermouse



# Vertical Mice



# Monitors



# Monitor Position

- Position the computer monitor so the top of the screen is at or just below eye level.
- Position the monitor directly in front of you to avoid excessive twisting of the neck.
- The monitor should be approximately an arm's length away from you to avoid eye strain.
- Position monitors at right angles from windows to reduce glare.

# Monitor Height

Monitor too high



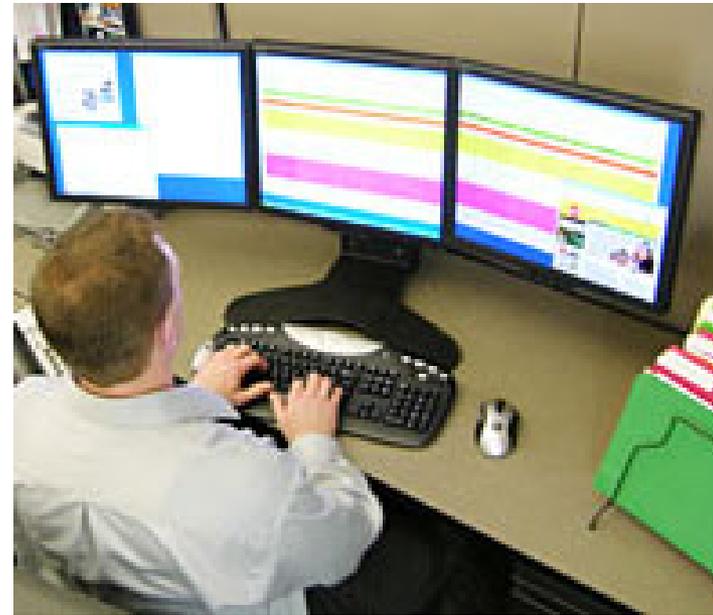
Monitor too low



# Laptop Risers



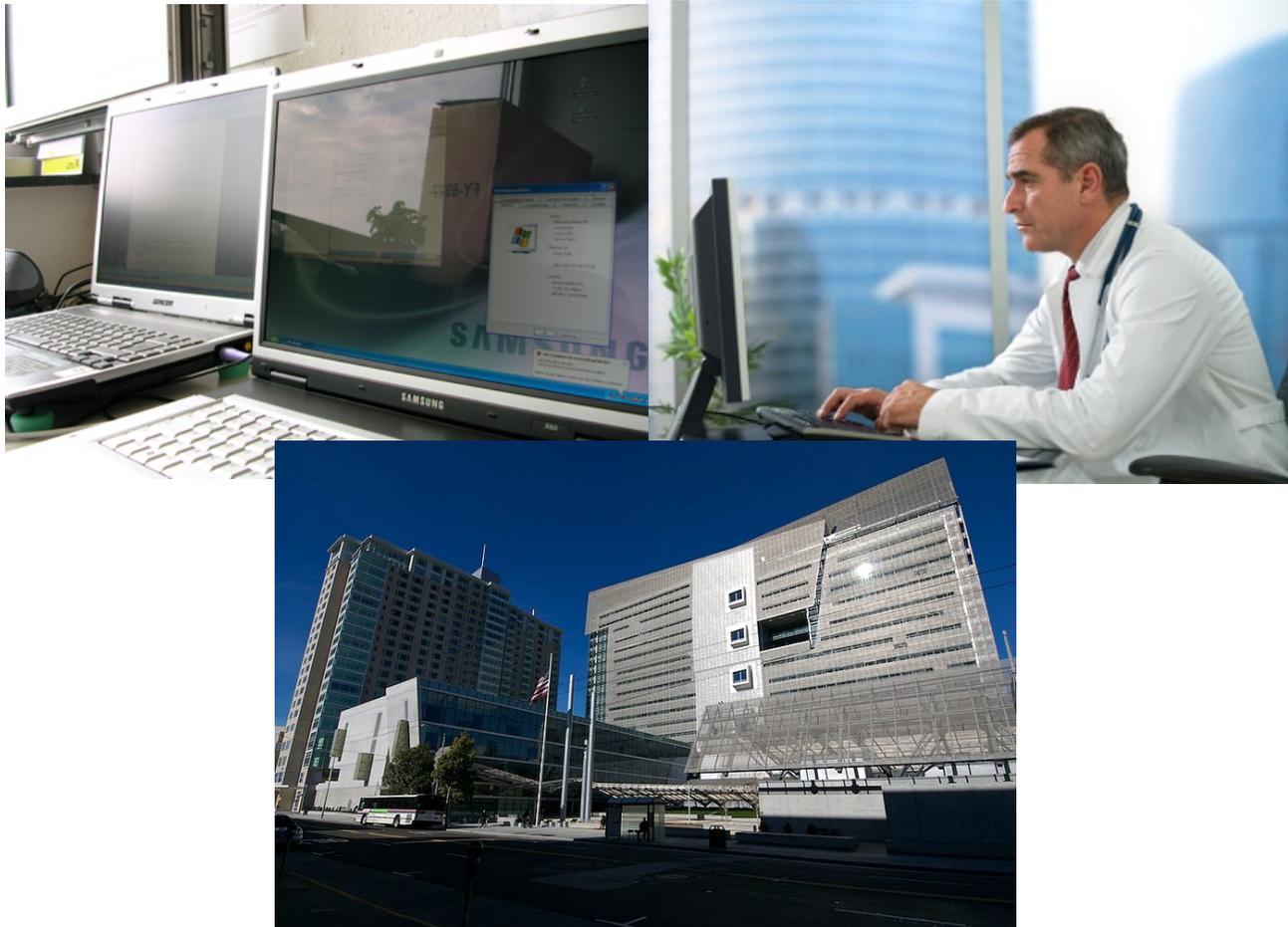
# Monitor Height – Multi-Monitors



# Monitor Use

- Slightly tilt the top of the monitor away from you at a 10 to 20 degree angle or at a right angle to the floor.
- Make sure the surface of the viewing screen is clean.
- Adjust brightness and contrast to optimum comfort.

# Lighting/Glare



# Lighting

- Use the following recommendations to reduce eyestrain, eye fatigue, and headaches:
  - Close drapes/blinds to reduce glare.
  - Point desk lights away from the monitor to reduce glare.
  - Use indirect light or shielding (where possible).

# Lighting Continued

- ❑ Place monitor at 90 degree angle to windows (where possible).
- ❑ Reduce overhead lighting (where possible).
- ❑ Walls should be covered with a medium color, flat or textured finish to reduce glare.
- ❑ Use an antiglare screen or monitor shield to reduce glare from overhead lighting.

# Keyboard Trays, Keyboards, Input Devices, Lights, Footrests, Document Holders

- GSA Advantage: [www.gsaadvantage.com](http://www.gsaadvantage.com)
- Alimed: [www.alimed.com](http://www.alimed.com)
- The Human Solution: [www.thehumansolution.com](http://www.thehumansolution.com)
- APHIS Ergonomics Program Website – Recommended Equipment:  
[http://www.aphis.usda.gov/mrpbs/emssd/recommended\\_equipment.shtml](http://www.aphis.usda.gov/mrpbs/emssd/recommended_equipment.shtml)

# Laptop Computers

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**NOTE: LAPTOP COMPUTERS ARE NOT  
RECOMMENDED AS PRIMARY  
COMPUTERS.**

# Laptop Computers

- ❑ Experiment with table height, chair height, & keyboard angle to maintain neutral wrist postures.
- ❑ If you are seated in a side chair or couch, use a pillow to support your arms while keying.
- ❑ Attach an external mouse instead of using the small constricted touchpad or trackball.
- ❑ Incorporate mini-breaks every 20 to 30 minutes to break up repetition and static postures.

# What's Right/Wrong with this Picture?



# Review

What factors/items would you include in your ideal computer workstation?



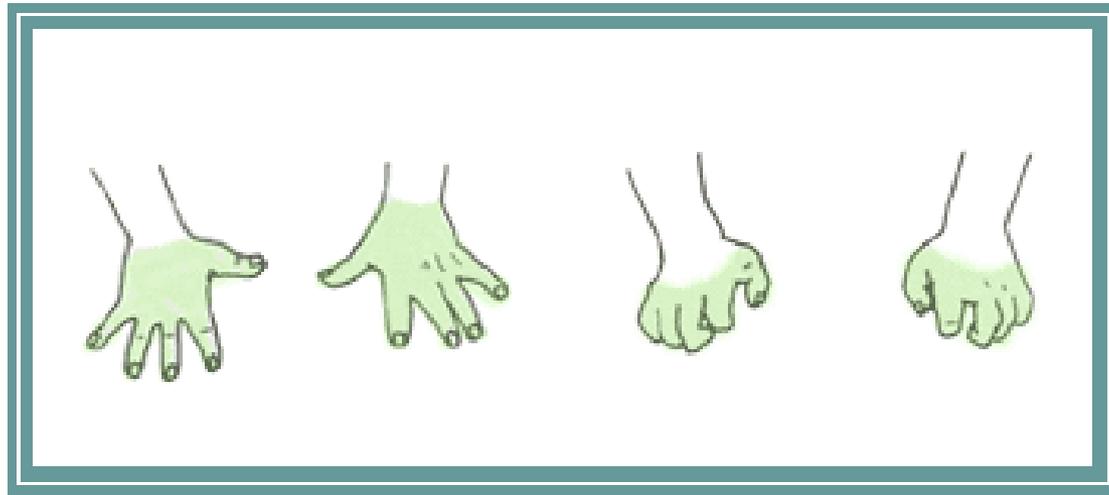
# Work Habits

- Take frequent (1 every 1/2 hr) mini-breaks to get up and stretch or walk around.
- It is also important to change positions periodically.

# Exercises

You can perform the following exercises at work throughout your day. These exercises can help energize your body and relieve muscle tension.

# Hand Stretches



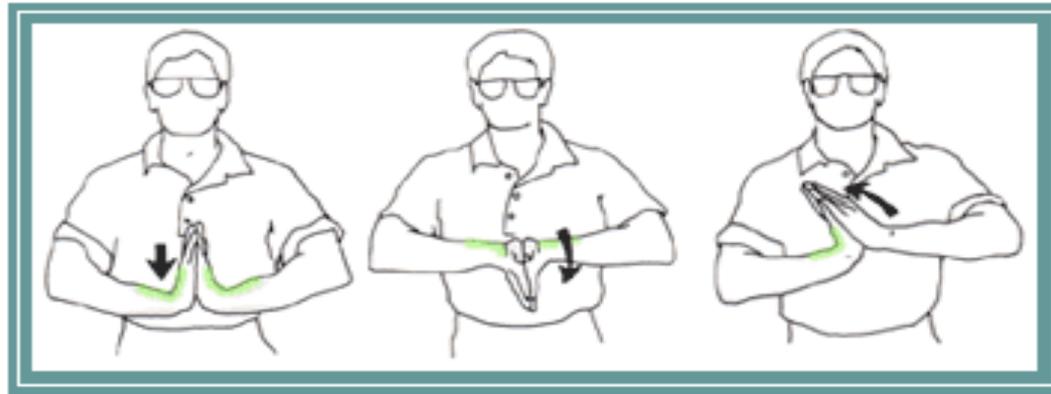
Separate and straighten your fingers until the tension of a stretch is felt.

Hold 10 seconds.

Relax, then bend fingers at the knuckles and hold 10 seconds.

Repeat the first stretch once more.

# Wrist Stretches



Place your hands palm-to-palm in front of you.

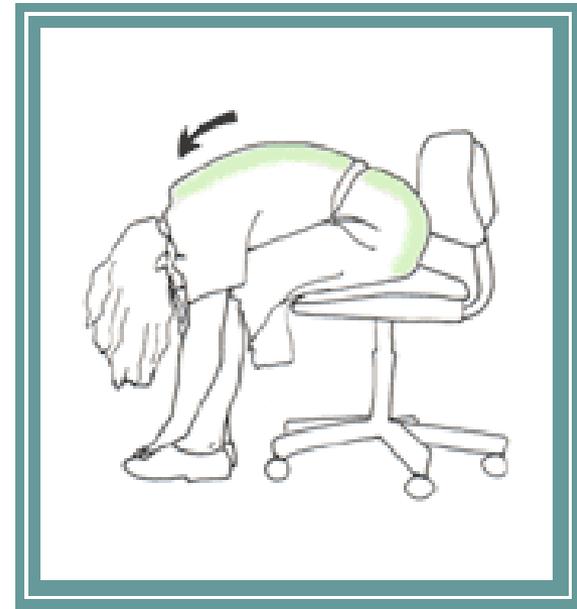
Move hands downward, keeping your palms together, until you feel a mild stretch.

Keep elbows up and even.

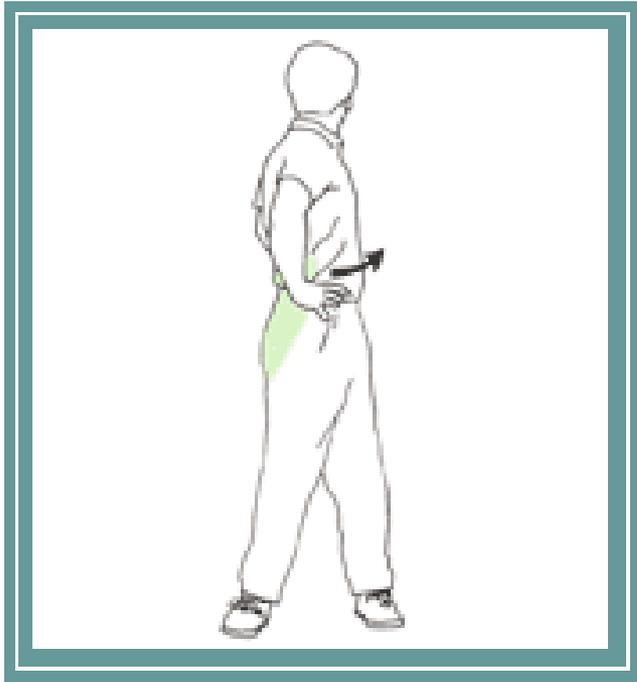
Hold 5-8 seconds.

# Back Stretches

- Lean forward to stretch.
- Keep your head down and your neck relaxed.
- Hold 10 - 20 seconds.
- Use your hands to push yourself upright.

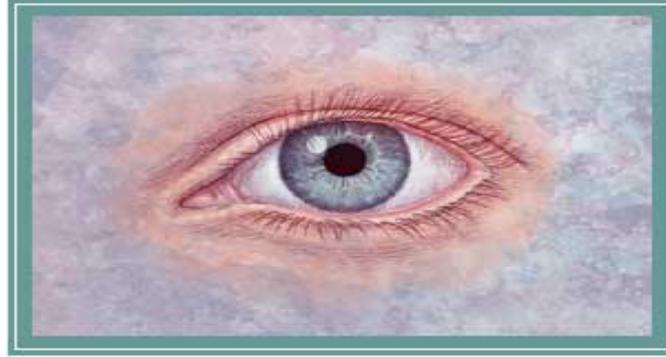


# Back Stretches



- Stand with hands on your hips.
- Gently turn your torso at the waist and look over your shoulder until you feel the stretch.
- Hold 8 - 10 seconds.
- Repeat other side.
- Keep your knees slightly flexed.
- Do not hold your breath.

# Eye Stretches



## Palming

Cover your closed eyes with your hands, so that the palms are over (but not touching) your eyelids. Your fingers should overlap above your nose on your forehead.

Take several deep breaths and take in the complete darkness (or visualize a relaxing setting).

After 20 seconds or so, uncover your eyes and allow them to refocus.

# Eye Stretches

## Refocus Routine

If you regularly work with your computer, you should periodically look away to allow your eyes to change focus. This exercise should be repeated regularly throughout the day. Here's how to do it:

Identify two objects that are roughly 20 feet away and relax.

Comfortably focus on one object for approximately 10-15 seconds, then focus on the other object for 10-15 seconds.

Return your focus to your monitor and continue working.

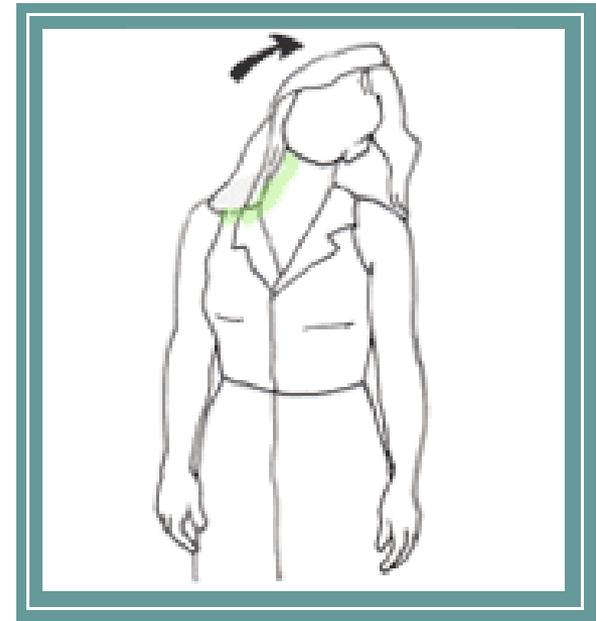
# Shoulder & Arm Stretches



- Interlace your fingers behind your back, palms facing your back.
- Slowly turn your elbows inward while straightening your arms until a stretch is felt.
- Lift your breast bone slightly upward as you stretch.
- Hold 10 seconds.

# Neck Stretches

- Slowly lower your neck to one shoulder, keeping that shoulder down.
- Hold 5-10 seconds.
- Do both sides.



# Available Services

- Equipment Loans – USDA Target Center
  - Keyboards, mice, footrests, etc.
  - 1-2 week loan period
  - Ordering information provided as requested
  
- Ergonomics Video-Lending Library (APHIS only)
  - “Back Protection – Defending Your Safety Zone”
  - “Office Ergonomics – It’s Your Move”
  
- Individual Ergonomic Evaluations
  
- Phone & Email Consultations

\*Contact your agency Safety and Health Program for more information.

# USDA Target Center

## □ Background:

- Target = Technology Accessible Resources Give Employment Today
- Est. in 1992 to support USDA with assistive technology (AT) & ergonomic solutions.
- Ensure all employees have safe and equal access to electronic and information technology.
- Collaborate with the DoD Computer/Electronic Accommodations Program (CAP) to provide services for employees with disabilities.

# Target Center

- Provides:
  - Worksite assessments/consultations.
  - Presentations on AT, ergonomics, disability awareness.
  - Group & individual demonstrations.
  - Equipment loans.
  - Alternative Formats.

# Contact the Target Center

[target-center@usda.gov](mailto:target-center@usda.gov)

Phone

202-720-2600 (v/tty)

TTY

202-690-0942

Address

Room 1006-South Building  
1400 Independence Avenue, SW  
Washington, DC 20250

# Successful Ergonomics

- **Understand:** causes of WMSDs & ways you can prevent them.
- **Respect:** potential hazards caused by poor posture & an unhealthy office environment.
- **Communicate:** ways to eliminate stress factors & report symptoms early.
- **Commitment:** eliminate WMSDs in your office environment.

# Questions



# ***APHIS Ergonomics Program***

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