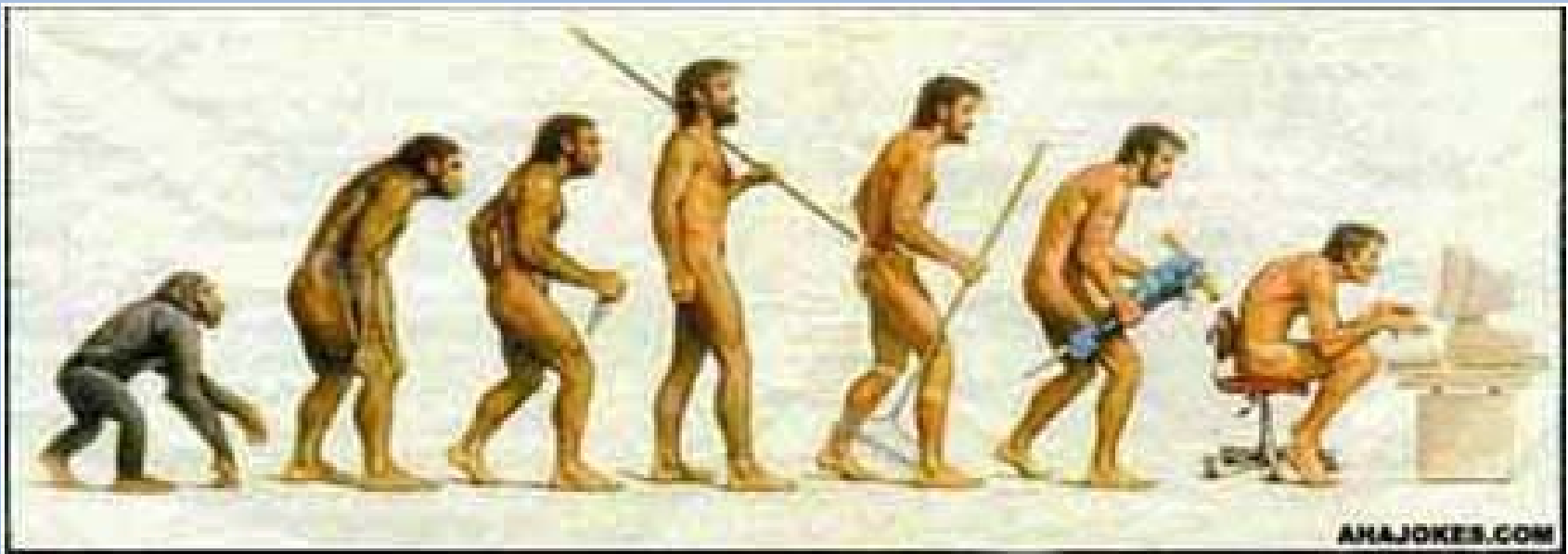# Introduction to Office Ergonomics

How we got here ...

Learning Objectives

- Understand the definition of Ergonomics

- Identify risk factors which contribute to Musculo-Skeletal Injuries (MSIs)

- Understand low risk computer workstation set-up

- Be familiar with general prevention principles

- Be aware of common problems in office environment

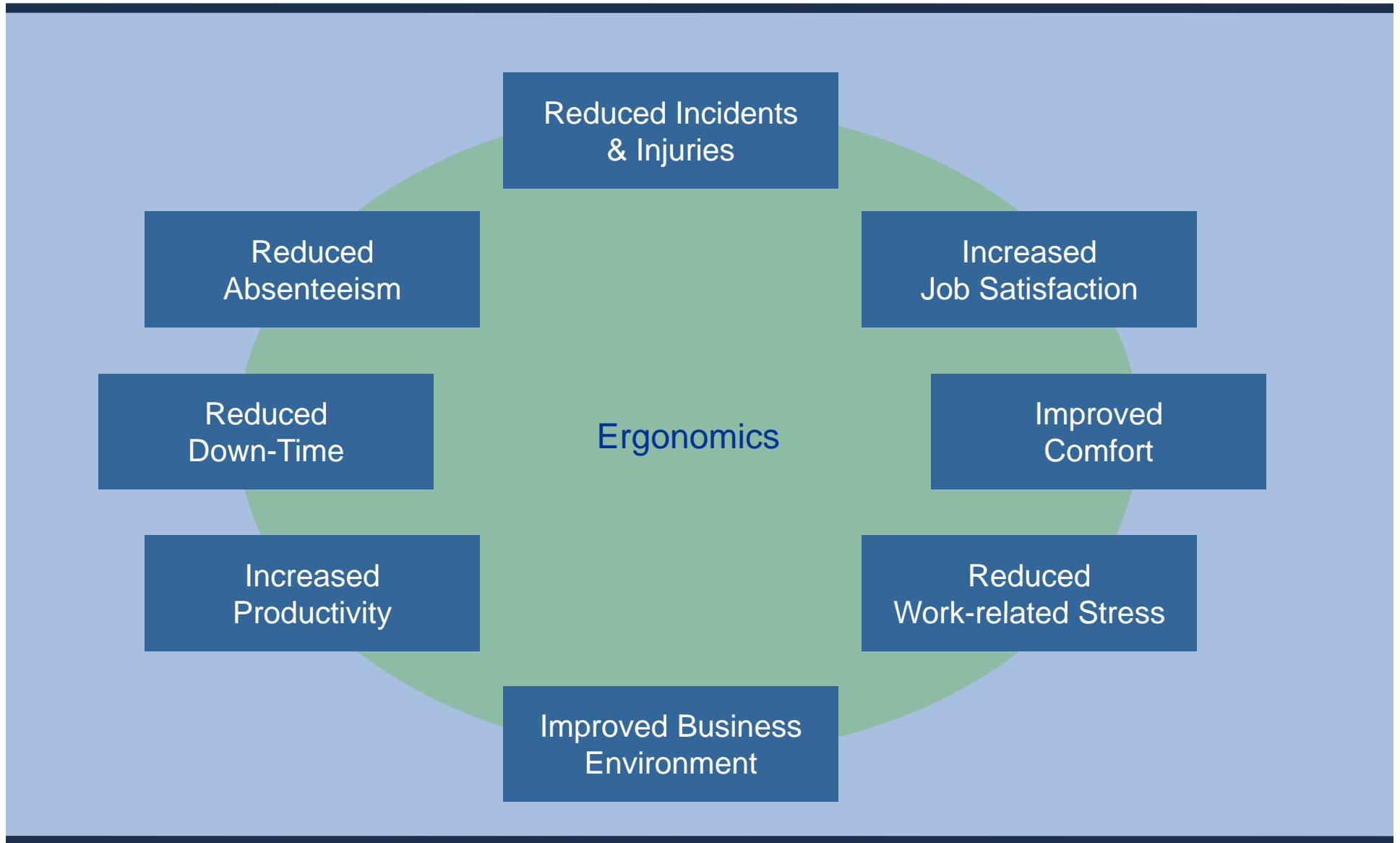Movement habits today have consequences for what you can do 10 years from now…

Define Ergonomics

"Fit the Job to the Worker"

- Make the interaction between the worker and the work environment as safe, efficient and comfortable as possible.

Benefits of Ergonomics

Reduced Incidents & Injuries

Reduced Absenteeism

Increased Job Satisfaction

Reduced Down-Time

Ergonomics

Improved Comfort

Increased Productivity

Reduced Work-related Stress

Improved Business Environment

Musculoskeletal Injury (MSI)

Definition:

"...an injury to a worker of the muscles, tendons, ligaments, joints, nerves, blood vessels or related soft tissues that are caused or aggravated by work, and includes overexertion injuries overuse injuries."
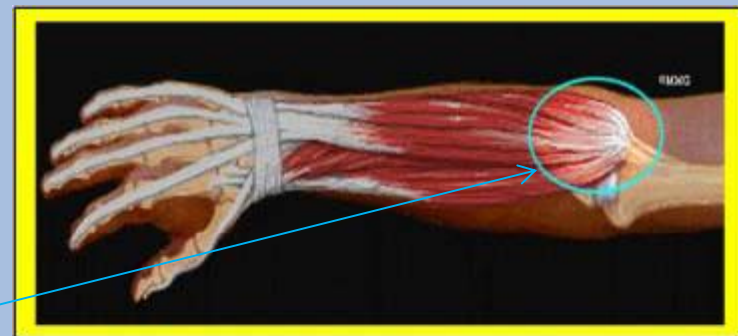
Examples of Common MSIs

Some Examples:

- Carpal Tunnel Syndrome
- Wrist Tendonitis
- Shoulder Tendonitis
- Tennis or Golfer's Elbow
- Trigger Finger
- Bursitis
- Eyestrain

Carpal Tunnel Syndrome occurs as a result of Median Nerve Irritation.

Example: Typical point of discomfort for 'tennis elbow.
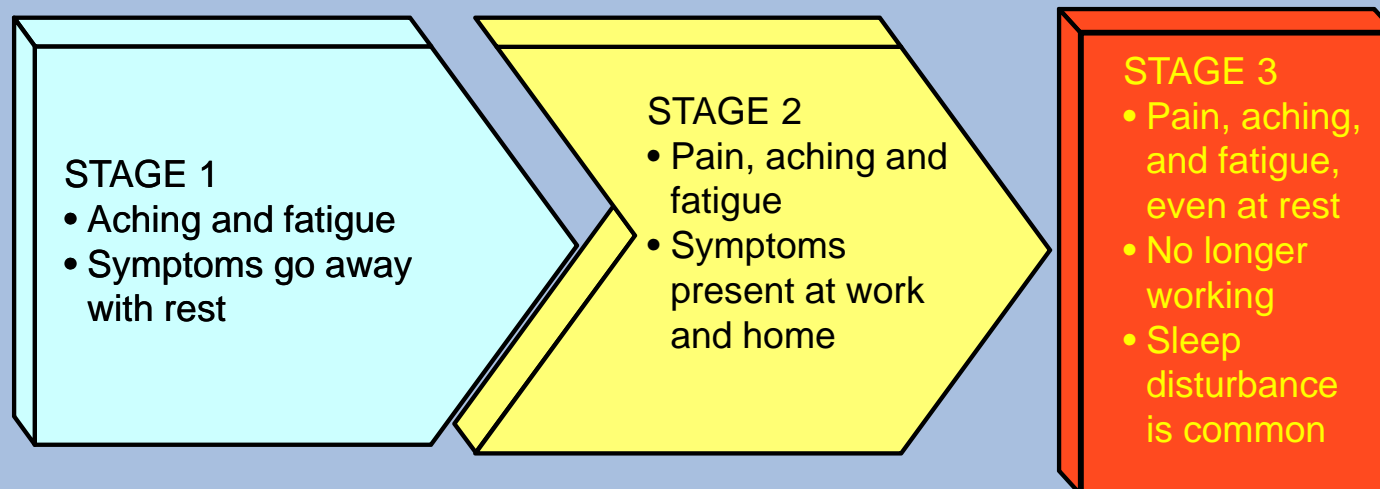
Signs & Symptoms of MSI

- Fatigue
- Discomfort or Pain
- Tingling or Numbness
- Redness / Heat or Swelling
- Decreased range of motion
- Weakness
- Headaches
- Dry / Tired Eyes or Blurriness
- Symptoms that occur toward the end of the workday or work week

WARNING SIGNS

The Importance of Early Intervention

When dealing with MSIs, the most critical thing is to deal with them ASAP!!

- Increased success of interventions & treatments

- Less impact on work (productivity & lost time)

- Less impact on life

STAGE 1
- Aching and fatigue
- Symptoms go away with rest

STAGE 2
- Pain, aching and fatigue
- Symptoms present at work and home

STAGE 3
- Pain, aching, and fatigue, even at rest
- No longer working
- Sleep disturbance is common

Risk Factors for Injury

1. **Awkward Postures - fatigue**

2. **Static Posture - ↓ blood flow**

3. **Repetition – cumulative stresses & fatigue**

4. **High Force – relative to the strength of the muscle**

5. **Contact Stress - ↓ blood flow and external stress**
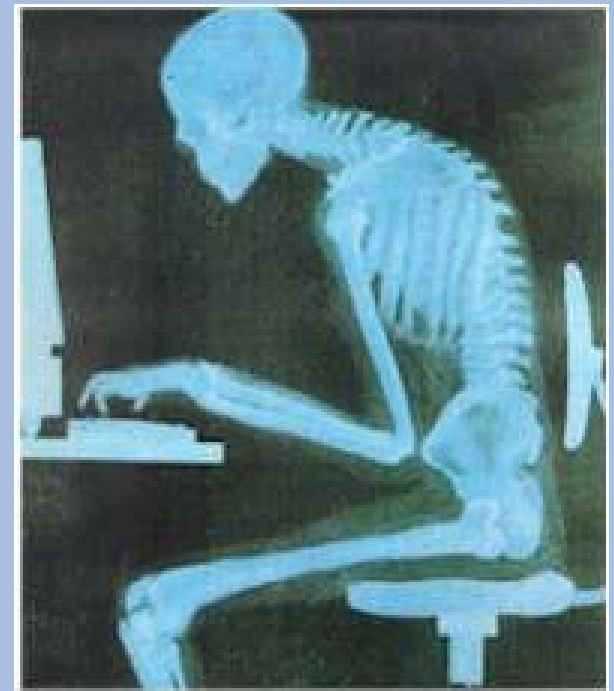
Examples of Awkward Postures
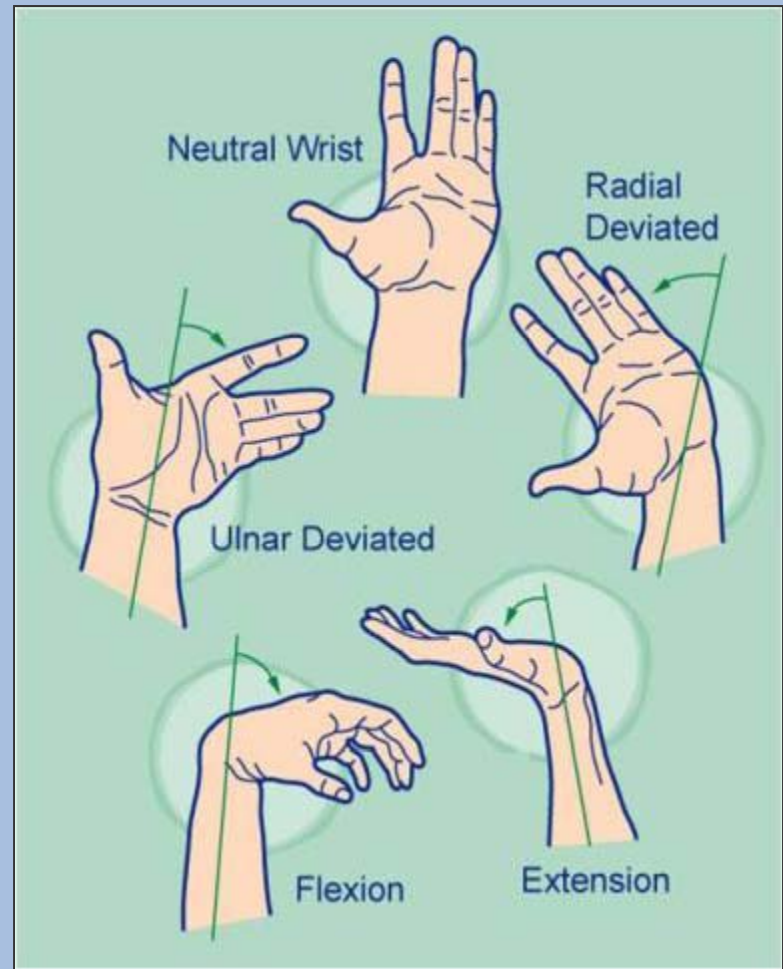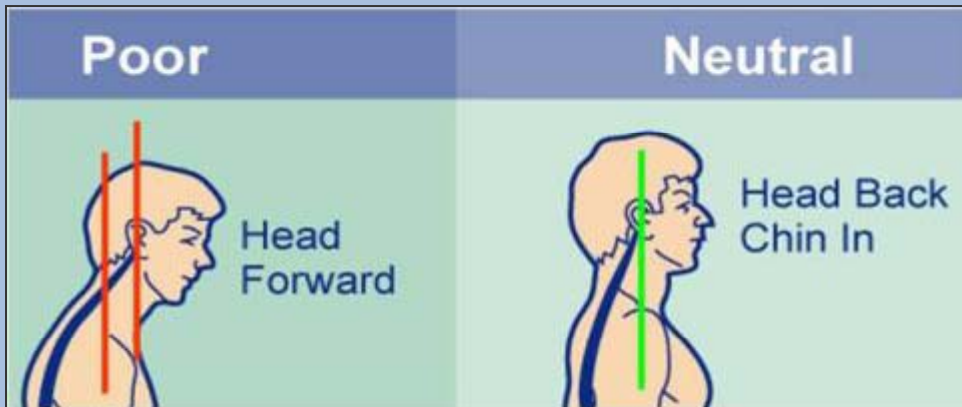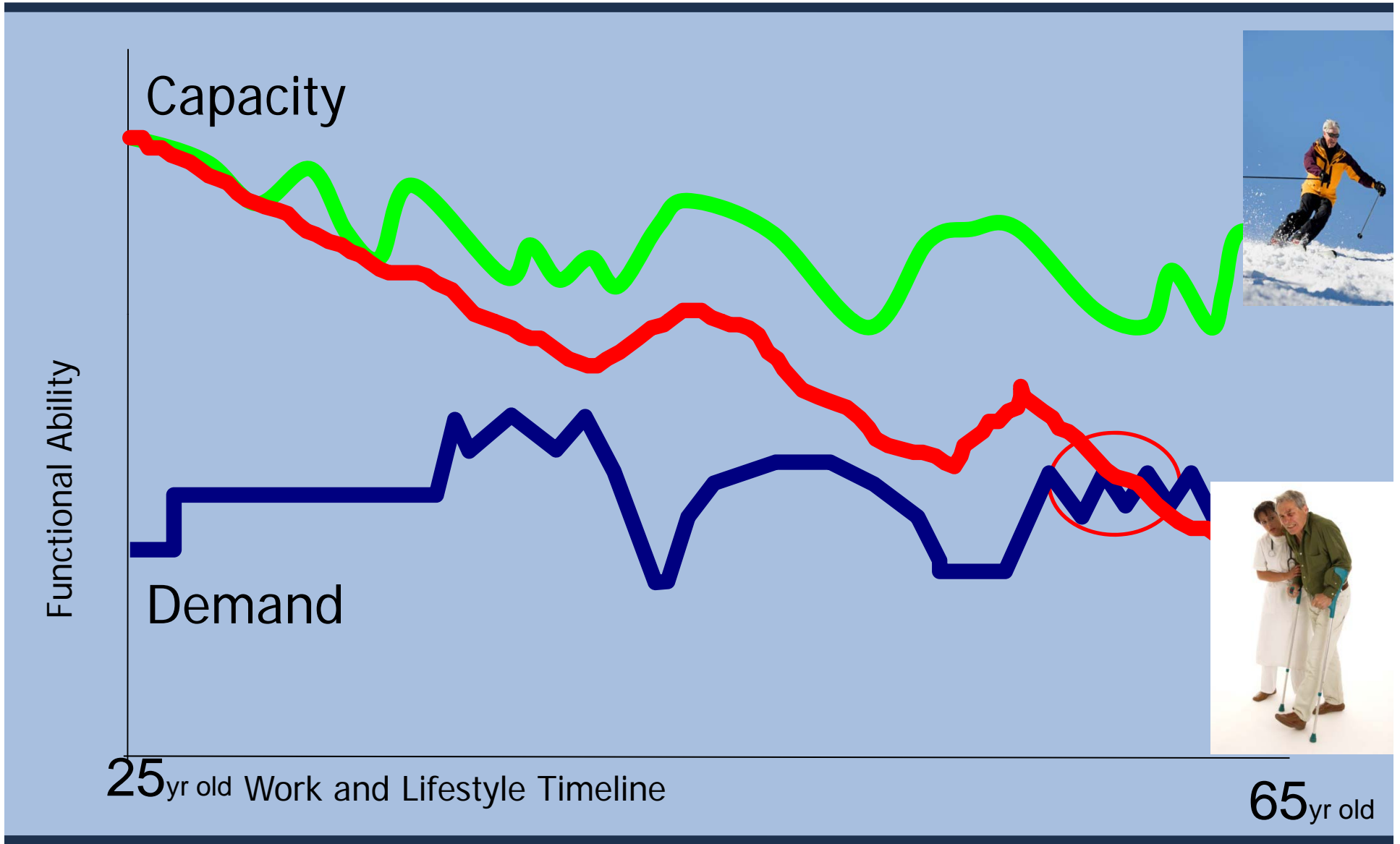
The Back

Neutral
- "S" – shaped
- Inward curve in low back

Awkward
- "C" - shaped
- Low back unsupported
- Bending or hunching forward
- Slouching when sitting

How MSIs Happen

Capacity

Functional Ability

Demand

25yr old Work and Lifestyle Timeline

65yr old

Neutral Posture

- Minimal muscle activity, minimal stress on muscles and joints
- Sit all the way back in chair, with chair back slightly reclined
- Head and neck upright
- Eyes level with top of screen
- Elbows bent to 90 degrees
- Wrists straight
- Hips slightly higher than knees
- Feet supported on floor or footrest
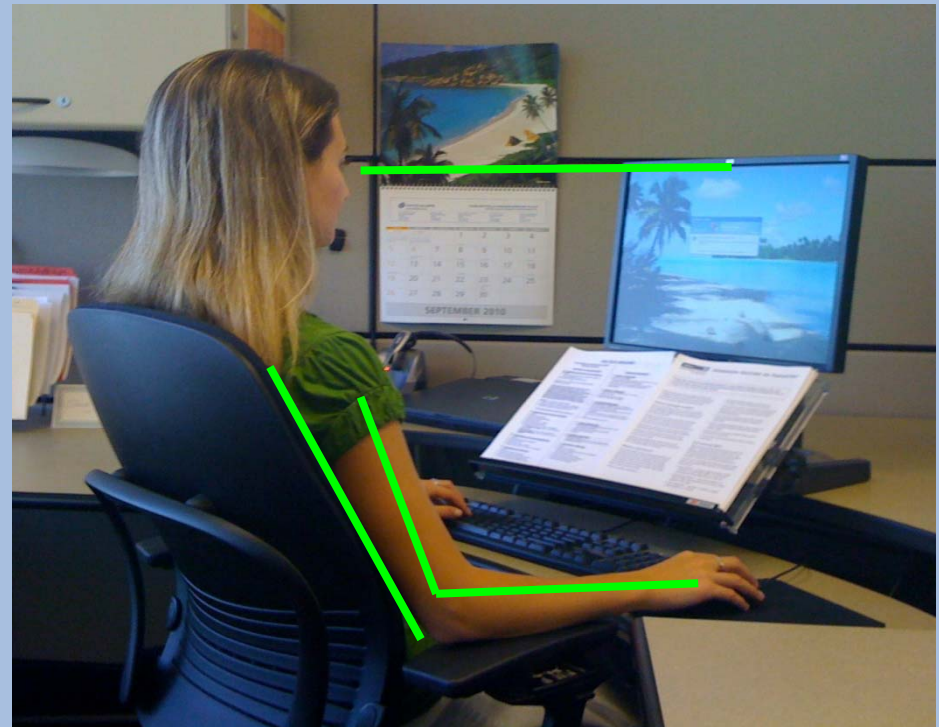
Good Sitting Posture

- Feet firmly supported on floor or a footrest.

- Sit <u>slightly</u> reclined from vertical.

- Scoot all the way back in the chair to maximize back support.

- Head upright – ear in line with shoulders.

- Hips level with or slightly higher than knees.

- Keep close to work to avoid reaching or leaning forward.

Tell Me About This Picture...
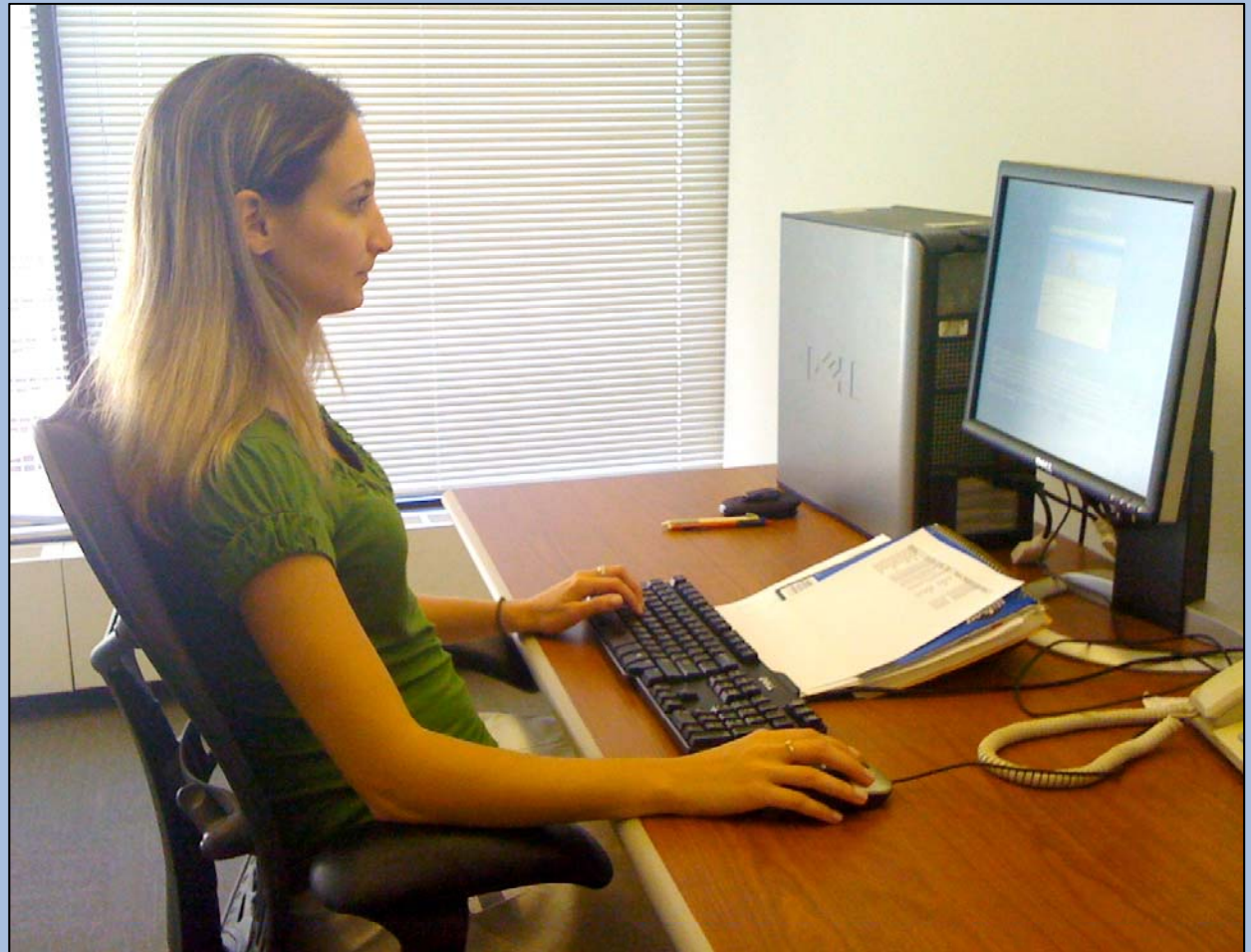
General Prevention Strategies

Minimizing the effect of risk factors

#1: Use Low Risk Postures

- Adjust equipment
- Reposition self regularly

#2: Vary Workload

- Minimum 5 min./hour - do something different, filing, check voice mail, etc
- Natural breaks (coffee, bathroom, etc)
- Chunking Tasks

General Prevention Strategies (cont'd)

#3 Stretching

- Increased blood flow
- Reduces tension
- Change of posture
- Minimize fatigue

#4 Vision Breaks

- 20-20-20 rule (every 20 minutes, look at something at least 20 feet away, for at least 20 seconds)
- blinking, closing eyes

The Vikings, of course, knew the importance of stretching before an attack.

General Prevention Strategies (cont'd)

5 Microbreaks

- Brief rests in neutral position - on sides of hands, palms face in
- Few seconds at a time whenever not keying or mousing
- Make this your 'home base'

6 Report Discomfort Early

- Early intervention speeds recovery
- Look for help if you can't figure out the problem yourself!

Top 10 Commonly Seen Problems

Can you guess what the common problems are??

1. Adjusting the Chair

COMMON PROBLEM:

- Not knowing how to adjust the chair results in:
  - Lack of adequate seated support
  - Increased likelihood of working in awkward postures

SOLUTIONS:

- Check the manual or ask a co-worker
- Get comfortable with all the controls

Chair Armrests

"To Rest or Not to Rest"

- Position just below tip of elbow when <u>shoulders relaxed</u>

- Armrests should support your arm in a neutral position

- Armrest should <u>not</u> stop you from sitting close

- Armrests should <u>not</u> hold elbows away from side of body
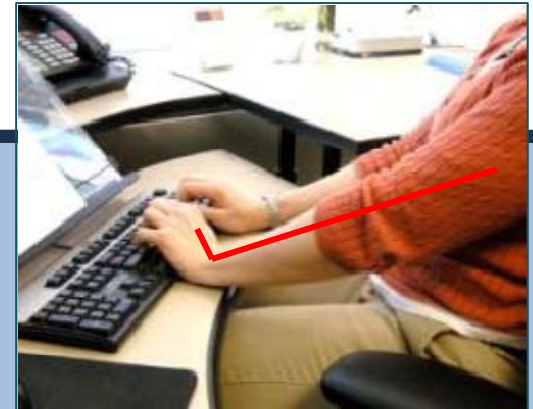
- Armrests are not required

2. Worksurface Height

COMMON PROBLEM

Incorrect keyboard / mouse height

- Too low = awkward wrist postures, extended elbow postures, upper back hunch
- Too high = awkward wrist or shoulder postures

SOLUTIONS

- Raise or lower work surface
- Install a keyboard tray if (keyboard/mouse too high)
- Raise or lower chair (may need footrest)

3. Keyboard Angle

COMMON PROBLEM

Incorrect work surface or keyboard angle

- Keyboard in positive tilt = wrist extension
- Keyboard tray tilted up = wrist extension

SOLUTIONS

- Make sure the "legs" on the back of the keyboard are down
- Adjust the tilt of the keyboard tray (horizontal or slight negative tilt up to 10 degrees)
- *Exception: non touch-typists
- *Wrist rest can offset the angle
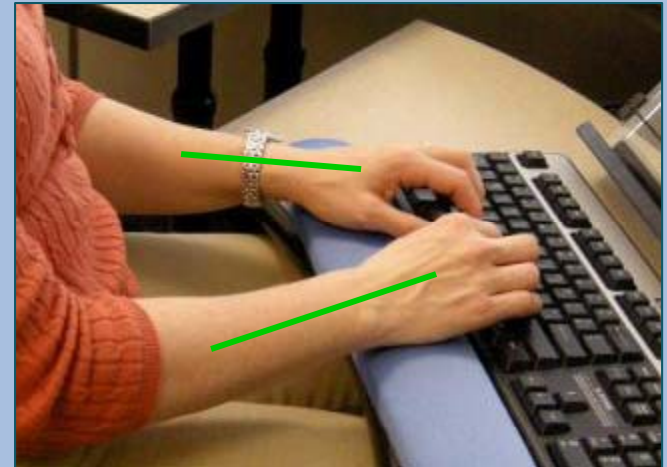
4. Input Device Position

COMMON PROBLEM

Mouse and/or Keyboard too far away

- Awkward, static wrist and shoulder postures
- Excessive forwards or sideways reaching
- Forward leaning or twisting

SOLUTIONS

- Mouse at same height and directly beside keyboard
- Sit close to work to reduce reaching
- Position keyboard and mouse at front edge of work surface / keyboard tray
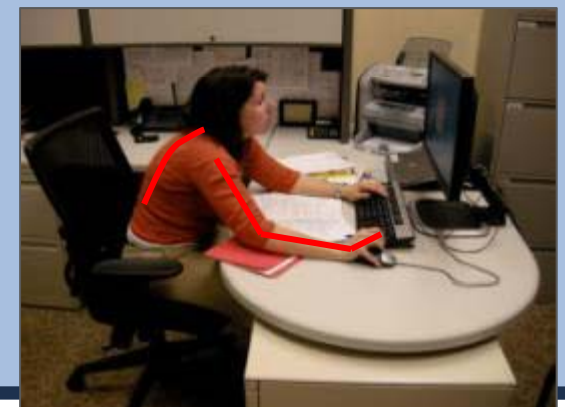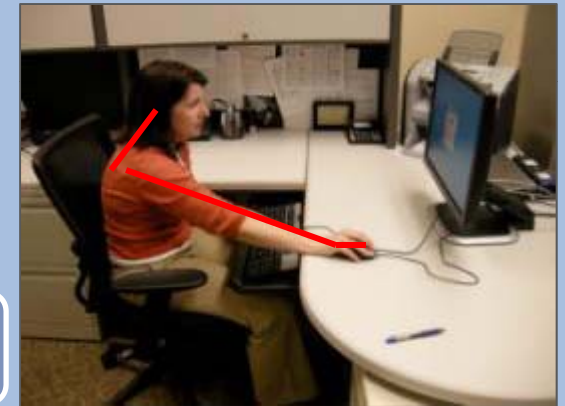
5. Input Device Behaviours

COMMON PROBLEM:

Wrists resting on desk while typing/mousing

- Contact stress on Carpal Tunnel
- Awkward wrist posture when moving mouse (windshield wiper motion)
- Static wrist extension

SOLUTIONS

- Elevate wrists when typing
- Move hand forward on mouse & use more forearm motions, avoid 'anchoring' on wrists
- Wrist rests: use between thoughts with hands in neutral position (palms sideways)
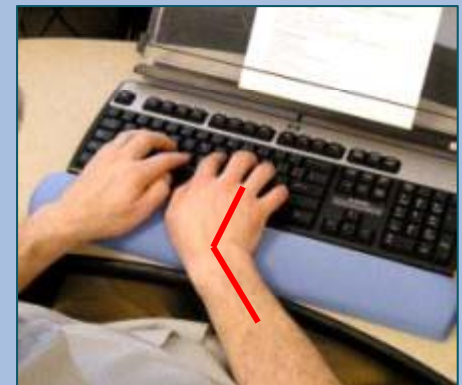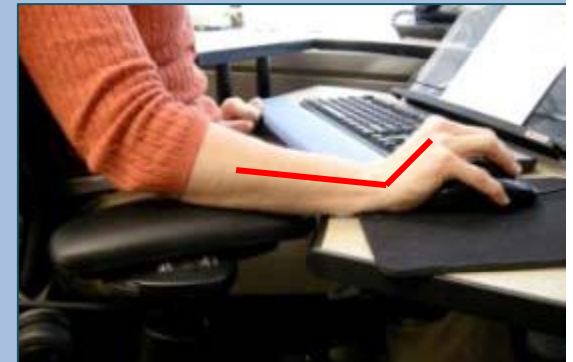
6. Sitting Too Far Away

COMMON PROBLEM :

Reaching forward to access work

- Awkward shoulder postures
- Awkward neck postures
- Lack of back support

SOLUTIONS

- Sit back in chair and keep chair close to front edge of desk
- Try to keep arms relaxed at side of body
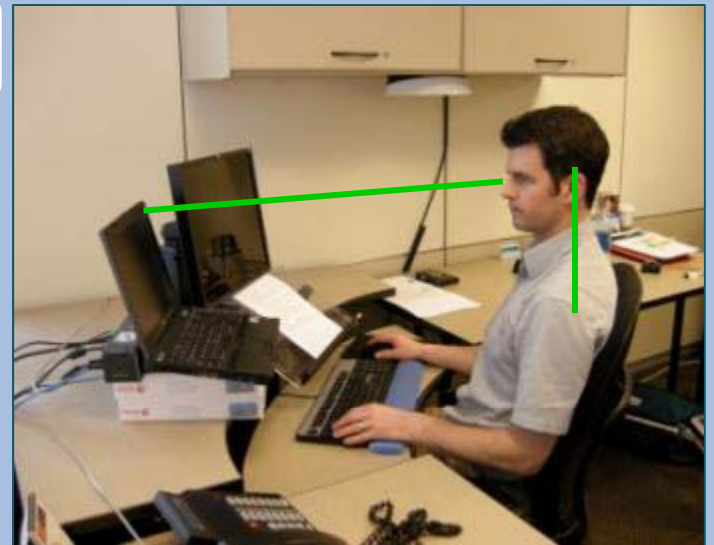
7. Monitor Position

COMMON PROBLEM:

Incorrect monitor position

- not centered = awkward / twisting neck or back postures
- monitor too far away = leaning forward, strain on eyes
- monitor too close = strain on eyes

SOLUTION

- Center monitor behind keyboard/mouse
- Position top of screen at eye level
- Distance depends on your vision
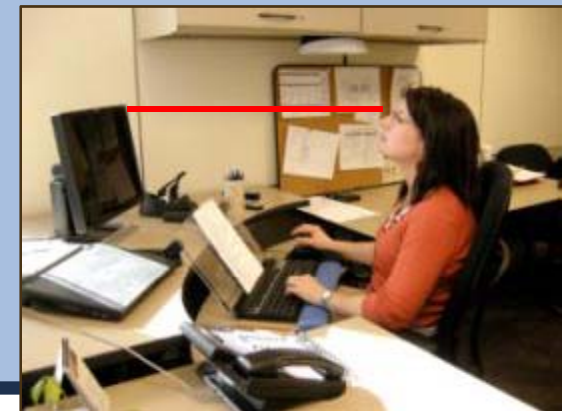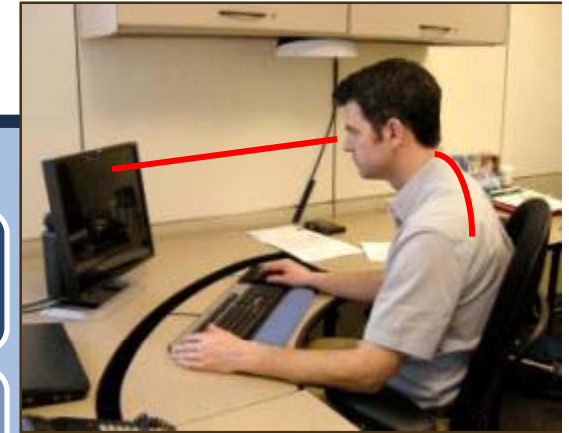
7. Monitor Position (cont'd)

COMMON PROBLEM :

Incorrect monitor height

- Monitor too high / too low = awkward neck posture

SOLUTIONS

- Too low: monitor risers, raise workstation if possible, lower chair (last resort)
- Too high: place monitor directly on desk, lower workstation if possible, raise chair
- NOTE: monitor often needs to be lower for bifocal lens wearers

8. Glare

COMMON PROBLEM:

Glare on monitor

- Glare = strain on eyes, frustration
- Sources of Glare (reflected or direct): windows, overhead lights, task lights, screen settings

SOLUTIONS

- Place monitor perpendicular to windows
- Close blinds/shades
- Adjust monitor tilt to vertical or slightly down
- Adjust brightness and contrast settings
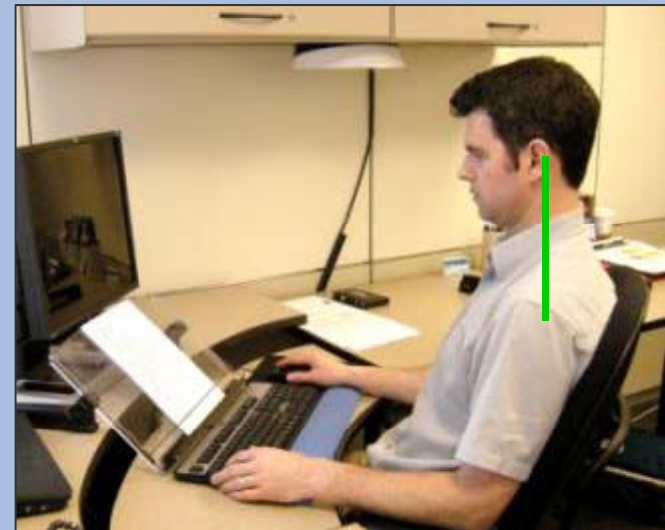
9. Document Position

COMMON PROBLEM:

Reading documents positioned flat on desktop

- Static & awkward neck posture

SOLUTION

- Document holder to improve the position of the document
- Binder to tilt up papers if have to write on them.

10. The "Phone Trap"

COMMON PROBLEM:

Using phone between ear and shoulder

- Very awkward and static neck and shoulder posture.
- Contributes to awkward wrist/arm postures

SOLUTIONS

- Hold phone with hand
- Move phone to left side of computer
- Frequent use + computer (>2 hrs/day): speakerphone or headset

Summary

1. Take the time to adjust equipment **before** starting work

2. Consistently use low risk postures

3. Take frequent microbreaks

4. Take regular stretch breaks

5. If needed, get help!!

Questions???