How to Sit, Stand, and Work Smarter in Academia

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Objectives

Define Ergonomics
Workstation Ergonomics
Common Risk Factors
Solutions
Backpacks/Briefcases
Postural Exercises
Q&A
**Ergonomics - Defined**

**Ergonomics** is the scientific study of human work.

From Greek *ergon* meaning ‘work’

Considers physical and mental capabilities and limits of the worker as he or she interacts with tools, equipment, work methods, tasks, and the working environment.

A goal of ergonomics is to reduce work-related musculoskeletal disorders (MSD’s) by adapting the work to fit the person, instead of forcing the person to adapt to the work.
Dealing specifically with the office environment

Ergonomics is a tool that can be used to prevent injuries in the office

Goal is to reduce the risk of injuries & enhance work performance by removing barriers

People work more effectively, efficiently, and productively at their jobs

MUST consider Physical, Cognitive, and Organizational Ergonomics
Physical Ergonomics

Relevant Topics

- Working postures
- Materials handling
- Repetitive movements
- Lifting
- Work related MSD’s
- Work place layout
- Safety & health
Cognitive Ergonomics

Relevant topics

- Mental workload
- Decision making
- Skilled performance
- Human-computer interaction
- Human reliability
- Work stress
Organizational Ergonomics

Relevant topics

- Communication
- Crew resource management
- Work design
- Design of working times
- Teamwork
- Community ergonomics
- Cooperative work
- Quality management
Why are ergonomic approaches important?

Safety + Enhanced Productivity

Reduced Cost
Common Risk Factors

Repetition
Static Loading or Sustained Exertions
Awkward Postures
Mechanical Contact Stress
Forceful Exertions
Repetition

Performing the same or similar motions repeatedly that may result in trauma to joints and surrounding tissues.

Examples:

- Typing at the keyboard
- Moving & clicking the mouse
- Looking back & forth between monitor & source documents
- Writing by hand
- Using a calculator
- Flipping through files & paperwork
- Stapling & three hole punching by hand
Muscles hold the body in a single position for a long period of time, reducing circulation and increasing muscle tension which may lead to injury.

Sustained exertions are a type of static loading where force is applied continuously for long periods of time.

Examples:

- Sitting or standing for long periods of time
- Holding down the shift button
- Holding hands in place above keyboard/mouse
- Holding phone
- Holding boxes/backpack/briefcase while carrying them long distances
Awkward Postures

Postures that move joints into positions where they are more likely to become injured

Examples:

- Typing with bent wrists
- Turning head to view monitor
- Leaning over to type/transcribing
- Reaching up & over keyboard to use mouse
- Slouching or leaning forward
- Cradling phone
- Bending at waist to load copy machine
Mechanical Contact Stress

A hard or sharp surface or object that presses into tendons, nerves, or blood vessels can cause damage over time.

Examples:

- Resting wrists on edge of desk while typing or using mouse
- Leaning on elbows on hard chair armrest or work surfaces
- Typing with palms resting on hard lip of keyboard
- Using scissors with hard metal handles
- Sitting in chair that places pressure on back of thighs
- Using rubber stamp with handles that press into palm of hand
Forceful Exertions

Many office tasks require a moderate amount of force to be applied by very small muscles, which may lead to fatigue, muscle strain and ligament strains.

Examples:

- Dragging and dropping or gripping the mouse
- Pounding on the keyboard
- Grasping thick folders or manuals
- Stapling or stamping by hand
- Opening 3-ring binders
- Lifting heavy manuals one-handed
Other Considerations: Environmental Nuisance Factors

Noise
Illumination
Heat/cold
Ventilation
Color
Vibration
General Tips

- Avoid reaching out over obstruction to lift, hold, or lower object.
- Store heavy items at waist height
- **PUSH** instead of pull
- Change positions & stretch occasionally
Lifting

The wrong way!

The right way!
Sitting Posture

Head forward
Pelvis tucked

Chest stuck out
Pelvis over-tilted

Ear over shoulder
Pelvis slightly tipped forward

NO! NO! YES!
Correct Sitting Posture for Computer

- Eyes level with top of monitor
- Shoulders down, elbows close to body
- Chin down
- Arms parallel to floor resting on arm support
- Back support for curve in spine
- Feet flat on floor
Individual Workstation

Keep head level or slightly tilted downward
Place work in front of you so you are looking straight ahead
Sit with shoulders relaxed, not elevated, hunched, or rotated forward
Keep elbows close to side and bent at 90 deg angle, not extended out in front of your body
Use chair’s backrest to support lower back (lumbar curve)
Sit with entire upper body upright or slightly leaning back
Keep wrists straight while working, not bent
Sit with knees at same level or slightly below your hips
There should be no pressure points along back of your thighs or knees
Your feet should be slightly out in front of your knees and comfortably supported, either by floor or footrest
Standing Workstation
Anti Fatigue Mats for Standing Desks

- What to look for
  - Slip resistant
  - Wear resistant
  - Firm support
  - Reduces impact forces
Various Desk Alternatives
Number of Monitors - Setup

2 vs. 3
If you use them equally, center yourself between them
If you use one more than the other, center on that one monitor
Monitor Alternatives
Keyboards

Within arms’ reach
Wrist are straight
Most important: COMFORT
Don’t necessarily need pads
  - Keyboard nor mouse
  - For palms, not wrists
Keyboard Alternatives
Tips for Using a Laptop

Are you an occasional user or full-time user?

Occasional user
- Comfortable chair
- Position laptop for most neutral wrist posture
- Angle screen to minimize neck deviation

Full-time user
- Position in front of you
- Use separate keyboard & mouse
- Keyboard on negative tilt keyboard tray
  - Ensure neutral wrist position
- Mouse on adjustable position platform
Office Chairs

Adjustable seat height
Good lumbar support
Waterfall front edge
Five star pedestal
Casters
Swivel base
Chair Alternatives
Reach Zones & Work Flow

Reach Zones: how far you can reach without straining your body

- **Easy reach zone:** move hands & forearms with elbows at sides & shoulders relaxed (16-18”)
  - Keep frequently used items here: keyboard, phone, mouse, stapler, 3-hole punch, staple remover

- **Maximum reach zone:** move arm at shoulder without leaning forward (26-34”)
  - Keep less frequently used items here
  - Stand up to reach items above shoulder height or beyond this zone
Proper Storage of Supplies

Store heavy & frequently used items at or just below waist (~29”)
Store lighter, frequently used items at/between shoulder & knee height
If storing overhead, use a step ladder; DON’T REACH
Heaviest items are more easily handled if stored on floor
  ▪ Use a hand truck or assistance of co-worker to lift
Break down heavy loads into small loads when possible
Avoid storing items behind other items so they don’t have to be lifted
Avoid making shelves too deep (~20”)
Place labels on items listing weight
Store frequently used items close by
Keep aisles clear & wide for lifting aides
Common Risk Factors Using a Mouse

Grip – don’t throttle it! Hold it gently
From the elbow – don’t flick the wrist
Shape – it should fit your hand
Avoid restricting arm movement
Don’t use a wrist rest – restricted circulation, CTS
Mouse Alternatives
Phones

Headset
Phone cradle
Phone on non-writing side
Alternate sides (cellphone)
Backpacks/Briefcases

Alternate sides you carry backpack/briefcase

Weight: < 35 lbs (A.N.A.)

Backpacks on wheels
Postural Exercises

Chin Tucks: Slowly draw your head back so that your ears line up with your shoulders. Hold for 2-3 seconds. Repeat 10x throughout the day.
Postural Exercises

Scapular Retractions: Draw your shoulder blades back and down, pinching your shoulder blades together. Hold for 2-3 seconds. Repeat 10x throughout the day.
Postural Exercises

Upper Trapezius Stretch: Side bend your head to one side as if to bring your ear over to your shoulder. Provide slight overpressure with your hand. Hold this position for 20-30 seconds. Repeat to other side.
Postural Exercises

Pelvic tilts: Sitting with feet on floor, slowly round and arch your lower back. Repeat 5-10x throughout the day.
Everything is awesome when you’re part of a TEAM!