

# ADVANCED "OFFICE" ERGONOMICS FOR SUPERVISORS AND MANAGERS

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Aspen Risk Management Group / ERGOhealthy, A TRISTAR Company





**BILLIONS AND BILLIONS AND BILLIONS**

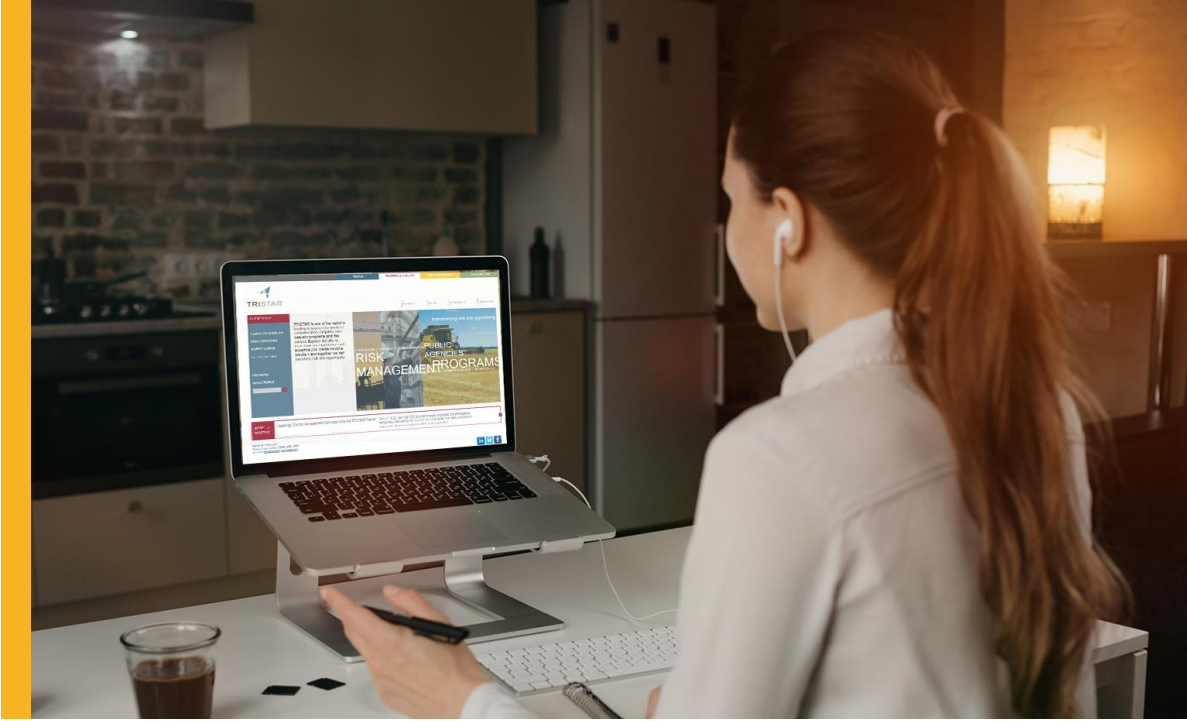
**MAYBE EVEN A TRILLION!**

## TODAY'S AGENDA



- Basic anatomy and physiology
- Types of musculoskeletal disorders
- Potential ergonomic stressors
- Work activities, including away-from-work, and discomfort data
- Conducting the workstation assessment
- Recommendations
  - Activity-based
  - Workstation-based
    - Adjusting existing equipment
    - Adding equipment or needed “tools”
- Coaching employees
  - Basics of ergonomics and workstation setup
  - Undoing “bad” ergonomic habits







**“Clothesjama”**

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## EXPECTATIONS

- The goal of the ergonomic assessment is to make the work environment more “comfortable” for the individual
- No “magic wand”
- Neutral postures



POLLING  
QUESTION



## POLLING QUESTION

## WHERE TO START

Ergonomics is not a perfect science – rules are flexible

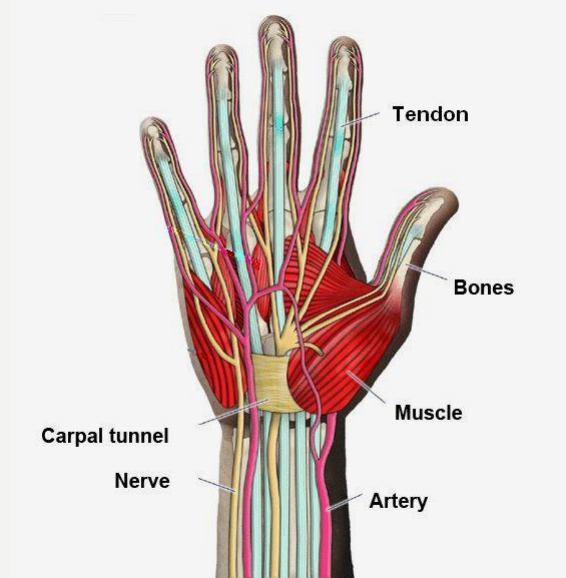
### Working remotely/virtually/traditional office – the basics

- Position of function – and comfort
- Everyone is unique - we're each made differently
- “Ergonomic” positions may not work for everyone
- Move , fidget, and re-adjust
- Posture, posture, posture
- Stay well-hydrated
- About every hour take a posture break and stand and move for a couple of minutes
- Alternate mouse



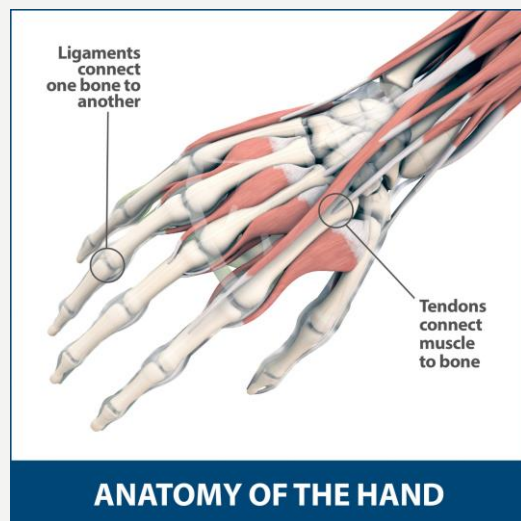
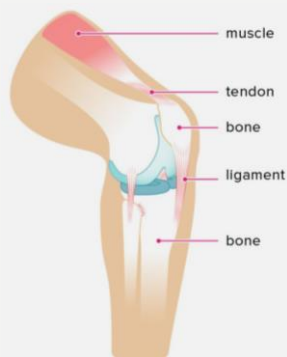
# MUSCULOSKELETAL SYSTEM

- Tendons
- Muscles
- Bones
- Nerves
- Blood Supply



# LIGAMENTS AND TENDONS

- Tendons
- Ligaments



## MUSCLES

- Provides strength to body
- Protect organs, bones,
- Protective layer
- Fibers run in same direction
- Swell by crushing



## SPINE

- **Vertebrae** stabilize the spine and protect the spinal cord.
- **Vertebral disks** cushion the vertebrae and allow movement.
- **Filled** with jelly-like substance. Can bulge or rupture.



**MUSCULOSKELETAL DISORDER (MSD)  
CUMULATIVE TRAUMA DISORDER  
REPETITIVE STRESS DISORDER**

INJURIES AND DISORDERS THAT AFFECT THE HUMAN  
BODY'S MOVEMENT OR MUSCULOSKELETAL SYSTEM  
(I.E. MUSCLES, TENDONS, LIGAMENT, NERVES, DISCS,  
BLOOD VESSELS, ETC.)

**COMMON CONDITIONS**

CARPAL TUNNEL SYNDROME  
TENDONITIS  
MUSCLE / TENDON STRAIN

# CARPAL TUNNEL SYNDROME

- Compression of the median nerve, caused by swelling or tissue position change within the carpal tunnel, irritates the median nerve
- One of the easiest controlled office illnesses



## SYMPTOMS AND AFFECTS

### Symptoms

- Pain
- Tingling
- Numbness
- Loss of Grip Strength



### AFFECTS

- THUMB
- INDEX
- MIDDLE FINGER
- WRIST

# TENDONITIS

## Inflammation of the tendon

- Repetition of a particular movement over time
- Stress on the tendons needed to perform the tasks
- Pulling, carrying, pushing, pulling, typing, gaming, texting, twisting, bending, stooping, writing, etc.

Repetitive or sustained application of force

- repetitive or sustained awkward posture
- repetitive or sustained movement

# TENDONITIS

## Symptoms include:

- Difficulty moving a joint
- Joint swelling in the affected area
- Pain, tenderness, and/or burning sensation around a joint
  - especially the hand, wrist, foot, or ankle
- Pain when moving a joint
- Redness along the length of the tendon

## RISK FACTORS FORCE, FREQUENCY, POSTURE

- Contact Stress
- Long Duration
- Awkward Postures
- Pressure/Force
- Physical Health
- Environmental Factors
- Repetition

## CONTACT STRESS

Results from occasional, repeated or continuous contact between sensitive body tissue and a hard or sharp object



## CONTACT STRESS

### Affects

- Fingers
- Palms
- Forearms
- Thighs
- Shins
- Feet

### Inhibits

- Blood flow
- Tendon and muscle movement
- Nerve function



## AWKWARD/STATIC POSTURES

**Awkward posture** refers to positions of the body that deviate significantly from the neutral **position** while performing work activities.

When in an **awkward posture**, muscles operate less efficiently and expend more force to complete the task

## AWKWARD/STATIC POSTURES

- Joint deviated from neutral/preferred position
- More awkward = greater risk
- Short duration typically not an issue
- Repeated, long duration leads to serious discomfort or injury



## PRESSURE/FORCE

- Sitting while exerting force
- Excessive pressure or force causes joints to give and tendons to tear
  - Stapling
  - Hole Punching
  - Stamping
  - Elbow on arm rest
  - Forearm on desk edge



# INDIVIDUAL HEALTH RISK AND INJURY FACTORS

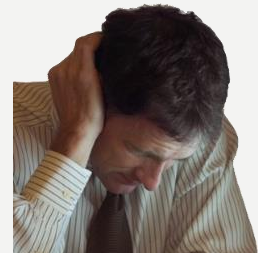
- **Gender** - some studies have found a higher prevalence of some musculoskeletal disorders in women
- **Cigarette Smoking/Vaping** - some studies have found smoking or vaping related to pain in the extremities, including the neck and back
- **Strength** - the risk for musculoskeletal injuries (in some studies) was three times greater in weaker subjects
- **Anthropometry** - weight, height, body mass index, and obesity have all been identified as indicators for certain musculoskeletal disorders
- **Physical Activity** - a lack (or over exertion) of physical activity may increase susceptibility to injury (sedentary lifestyles?)



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# ENVIRONMENTAL FACTORS

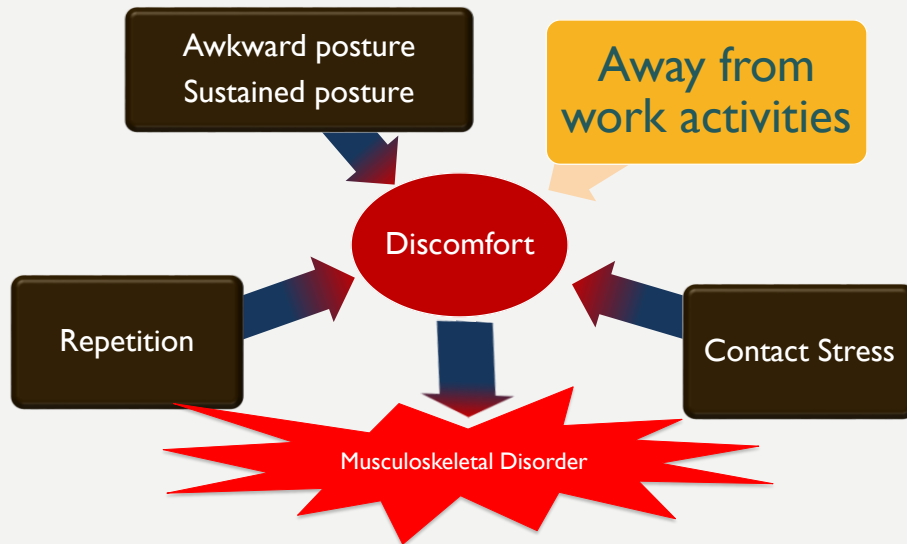
- Lighting
- Noise
- Vibration
- Heat
- Cold



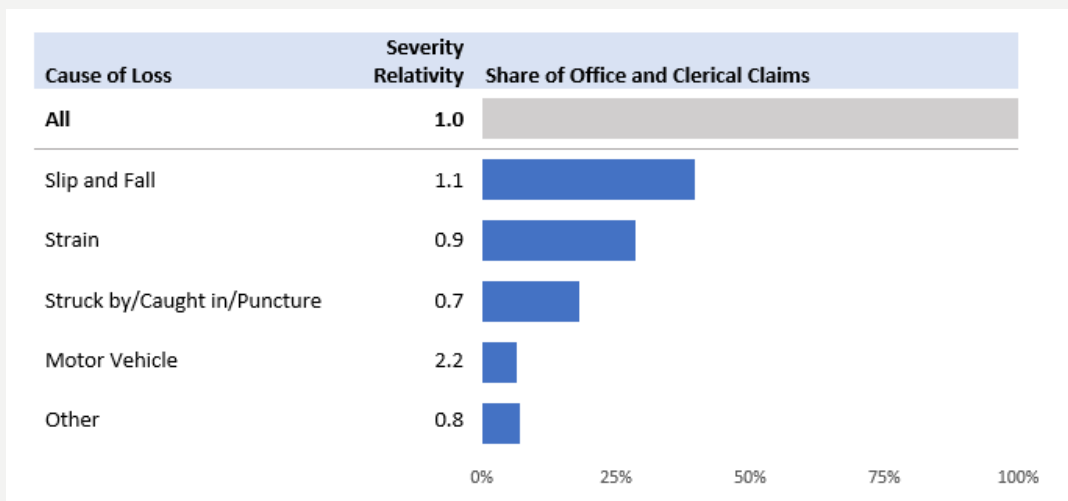
## Additional

- Old environment w/new equipment
- Old equipment in new environment
- Budget constraints
- Misinformation

## ERGONOMIC RISK FACTORS COMMON IN “THE OFFICE”



## INJURY TYPES – OFFICE/CLERICAL (INCLUDING HOME OFFICE)



## From home, office, or hybrid work model

Past 90 days – 2000 employees surveyed

### Tell us a little about yourself...

Poll Results (single answer required):

Newly working from home (within past 6 months)	6%
Experienced pro working from home (greater than 6 months)	63%
Hybrid (work from home/virtual and traditional office)	31%
Other	0%

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# CONDUCTING THE WORKSTATION ASSESSMENT

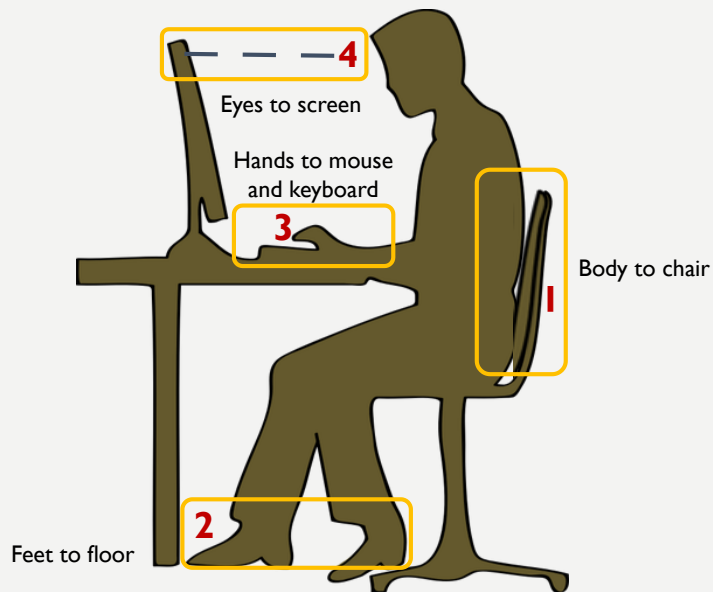


POLLING  
QUESTION



# POLLING QUESTION

## FOUR AREAS OF FOCUS



## Five steps – setting up workstation



# 5 STEPS

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## Start with seat

### Best Practices

- Knee height
- Lumbar support
- Depth of seat

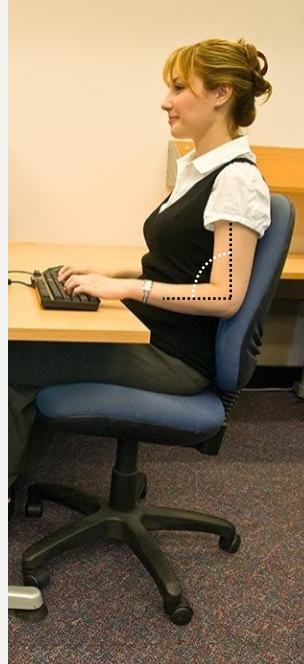


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## Step 1

### Adjust seat height to achieve

- Shoulders relaxed
- Elbows at about 90 degrees
- Forearms fairly level on horizontal plane
- Wrists fairly straight



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## Step 2

### Feet/legs supported

- Ensure hips and knees are at about 90 degrees
- Thighs somewhat parallel with floor
- Feet/legs well supported



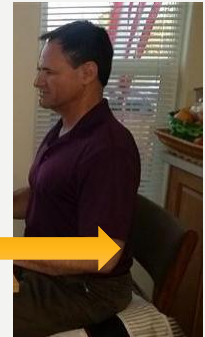
44

## Step 3



### Adjusting the seat back position

- In most cases the chair should support the spine in the upright position
- Adjust the lumbar support to fit into the small of your back
- *NOTE: Some people are comfortable sitting forward and not using the chair back for support. If posture and comfort are good, this is fine.*

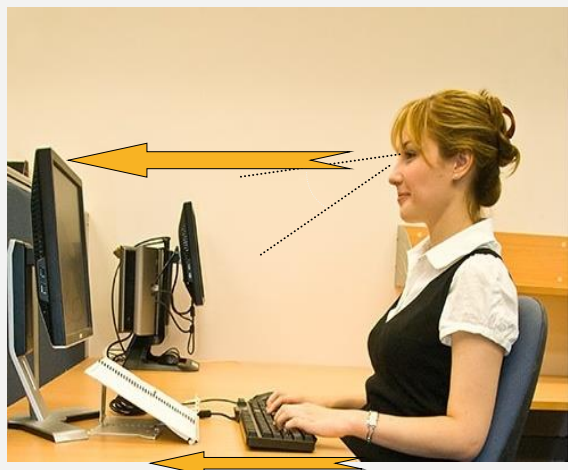


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## Step 4

### Monitor/screen position

- Eyes somewhat level with the TOP of the screen (depending on where work is performed)  
*Note: If wearing multi-focal lenses, screen might need to be slightly lower*
- Distance should be comfortable for reading when sitting upright and close the desk
- Keep monitor & keyboard on-center to self (dual monitors – either centered, or most used)



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# MONITORS



Single PC monitor



Dual PC monitors



Single Mac monitor



Monitor and Laptop



Laptop only

# SINGLE MONITOR POSITION



Directly front – center of monitor should be in line with your body

# DUAL MONITORS

## POSITION



Ideal position if monitors are used equally (about 50/50 or 60/40)



Ideal position if one monitor is primary and the other is secondary (about 70/30)



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# MONITOR AND LAPTOP

## POSITION



The laptop (as a secondary monitor) should be raised to the approximate height of the freestanding monitor

Use an external keyboard and mouse

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# LAPTOP ONLY POSITION

**Use external keyboard and mouse**

**To maintain eyes to monitor/screen**

Raise laptop screen



# LAPTOP ONLY

**Mid-long duration (2 to 4 hours)**

- Neck posture good (check display angle)
- Shoulders back, elbows at 90-ish degrees
- Soft part of hands / palm on laptop edge
- Inexpensive laptop board / support
- Unplugged and no wifi

## Best Practices

- Base under laptop for stability and separation
- Stretch break every hour
- If EMR / EMF concerns
  - Use unplugged and without WIFI & Bluetooth



# LAPTOP ONLY

Mid-long duration (2 to 4 hours)

- Shoulders back, elbows at 90-ish degrees
- Wrists straight / comfortable
- Minimal pressure on forearms

## Best Practices

- Check angle of screen for neck posture
- Stretch break every hour
- Fidget, wriggle, and squirm



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# COMMON MONITOR POSITIONING MISTAKES

**AVOID PLACING MONITORS IN FRONT OF WINDOWS**



**AVOID PLACING LAPTOP IN FRONT OF FREESTANDING MONITOR**



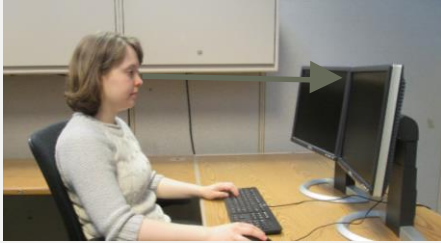
**BIFOCAL USER**



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# IDEAL MONITOR HEIGHT

NON BIFOCAL USER



BIFOCAL USER



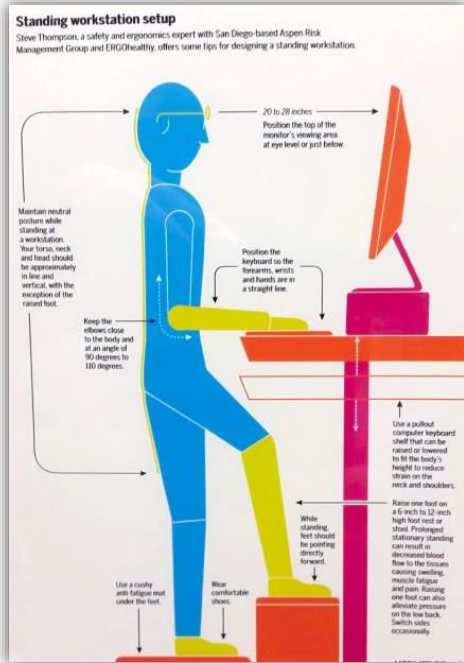
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## Step 5

### Eliminate awkward neck posture

- A document holder may be used to refer to or type from printed material
- NEVER cradle the phone between neck and ear

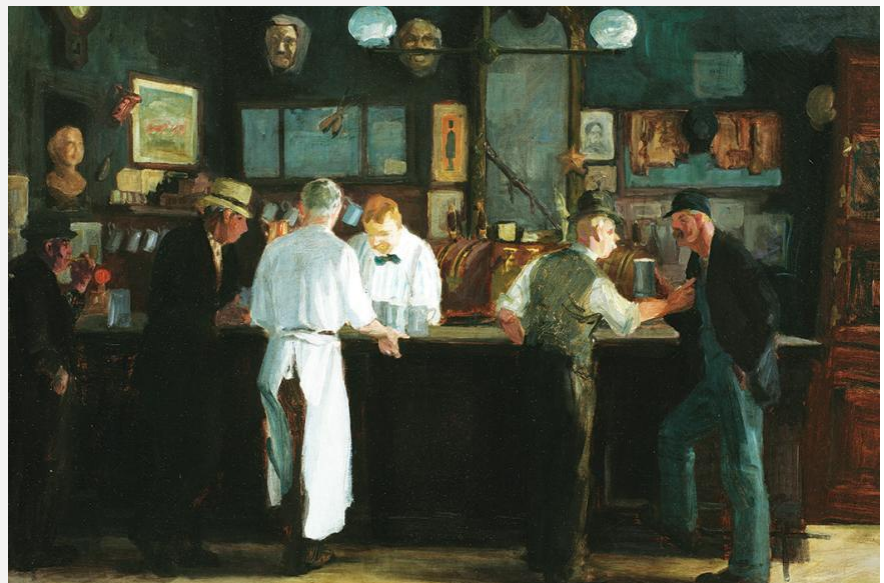




## STANDING WORK / SIT-STAND

Used infrequently for work from home

### A lesson from Cowboys ...



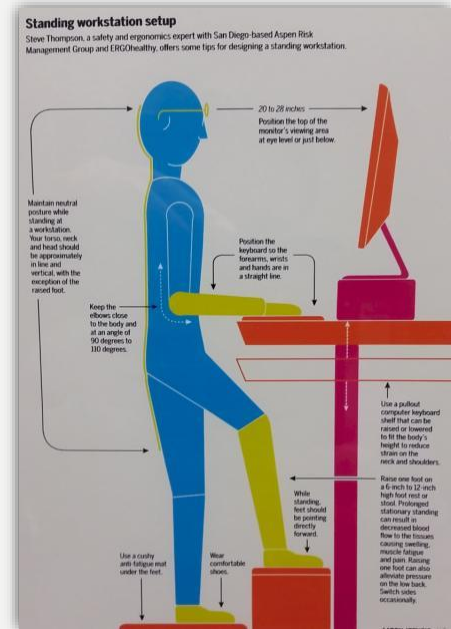
John Sloan, *McSorley's Bar*, 1912, oil on canvas.

## BEST PRACTICES – STANDING / SIT-STAND

- Change positions frequently when standing for prolonged periods
- Use a foot rest/stool/box (approximately six inches) to prop one foot up, and switch sides every so often.
- Vary tasks to avoid static postures
- Work on a carpet pad or mat. Wear shoes in most cases
- Alternate mouse between right and left
- Limit postures that cause you to lean or hunch forward

### Additional

- Prolonged standing for some may have health risks
- Can be difficult for single laptop into ergonomic position



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## SIT-STAND GUIDANCE (CORNELL UNIVERSITY)

### 30 minute period

- 20 minutes sitting (in a good posture)
- 8 minutes standing (for sit-stand workstations)
- 2 minutes of standing and moving

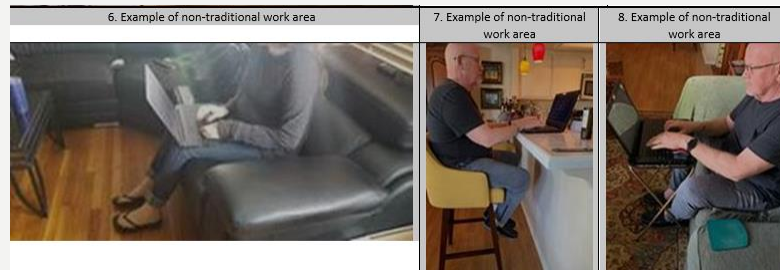
For a 7.5 hours workday (lunch is excluded) this means a daily regimen with a total of 5 hours of sitting, 1.6 sit-to-stand changes, 2 hours of standing and .5 hours of moving.



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## PHOTOS FOR ASSESSMENTS



### Strains, sprains, and discomfort

- **40% of WC costs = musculoskeletal disorders**
- **Cisco and Accenture pilot studies (10,000 EEs)**
  - **Persistent discomfort - pulled off task 5 minutes out every 15 minutes**
  - **Lost time/day/employee: 2.6 hours**
  - **Lost time/week/employee: 13 hours**
- **62% decrease in reported discomfort**
- **39% decrease in claims for ergonomic injuries**

## Ergonomics... the way it is

- Posture
- Interaction with electronic devices
- Sedentary lifestyle



POLLING  
QUESTION

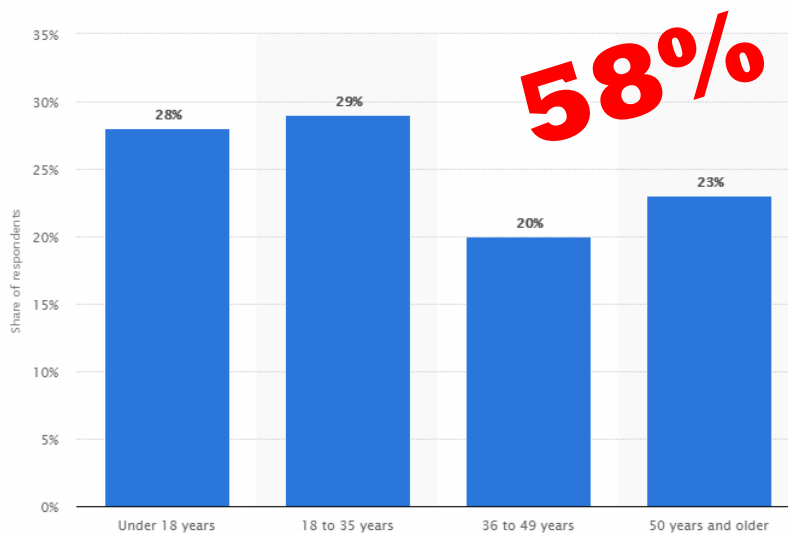
## Impact of sedentary events

- Sedentary workforce
- Office work is frequently ignored (versus “high hazard” work)
- “Remote work”
- “Explosion” of social networking/communication
- Gaming



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## Age breakdown of video game players in the United States



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## How much time do we really spend at work

24 hours/day X 7 days = 168 total hours

Average work hours = 40

40 work hours / 168 total hours = 24%



# SOME THINGS NOT TO DO – BAD

... other than for a few seconds to read an email heading or look at an image

- Twisting of body
- Feet/legs not supported
- Awkward postures



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# SOME THINGS NOT TO DO – BAD

... other than for a few seconds to read an email heading or look at an image

- Shoulder pulled forward / elbow positioning
- Hard / not-needed wrist support
- Alcohol may impair work product

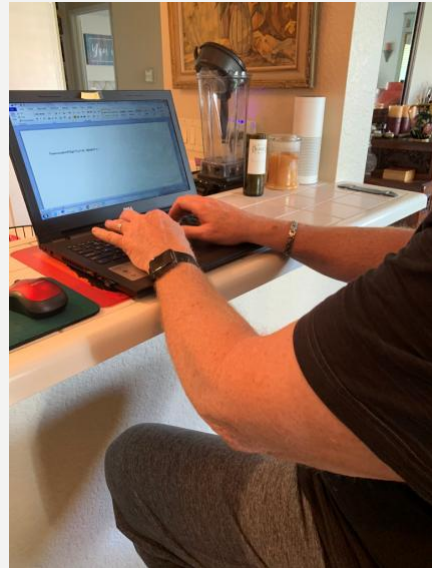


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# SOME THINGS NOT TO DO – BAD

... other than for a few seconds to read an email heading or look at an image

- Shoulders pulled forward / elbow positioning
- No room for legs/knees
- Pressure on forearms
- Watch and jewelry



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# SOME THINGS NOT TO DO – BAD

... other than for a few seconds to read an email heading or look at an image

- Hunched over
- Outstretched arms
- Neck / back posture



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## SOME THINGS NOT TO DO – BAD

... awkward body postures

- Right arm outstretched / shoulders forward
- Keyboard and mouse
- Armrests on chair (remove or lower)



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## SOME THINGS NOT TO DO – BAD

... awkward body postures

- Wrist pressure
- Large wrist watch on left wrist
- Possible awkward position of fingers



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# SOME THINGS NOT TO DO – BAD

... awkward body postures

- Difficult to maintain abdominal posture
- Neck strain
- Wrist hyper flexion / pressure point
- Smoking / nicotine may increase pain



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# SOME THINGS NOT TO DO – BAD

... awkward body postures

- Increased pressure on forearm / elbow
- Awkward body hip and shoulder postures
- Display panel angle



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# SLIGHTLY BETTER

Short-mid duration (1 to 2 hours)

- Shoulders back, elbows at 90-ish degrees
- Wrists straight / comfortable
- Minimal pressure on forearms

## Best Practices

- Firmer tabletop if available
- Sit on pad or pillow for better wrist position
- Check angle of screen for neck posture
- Stretch break every hour
- Fidget



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# SLIGHTLY BETTER

Short-mid duration (1 to 2 hours)

- Neck posture good (check display angle)
- Shoulders back, elbows at 90-ish degrees
- Wrists straight / comfortable

## Best Practices

- Base under laptop for stability and separation
- Reduce laptop heat
- Stretch break every hour
- If EMR / EMF concerns
  - Use unplugged and without WIFI & Bluetooth



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# BETTER

Mid-long duration (2 to 4 hours)

- Neck posture good (check display angle)
- Shoulders back, elbows at 90-ish degrees
- Soft part of hands / palm on laptop edge
- Inexpensive laptop board / support
- Unplugged and no wifi

## Best Practices

- Base under laptop for stability and separation
- Stretch break every hour
- If EMR / EMF concerns
  - Use unplugged and without WIFI & Bluetooth



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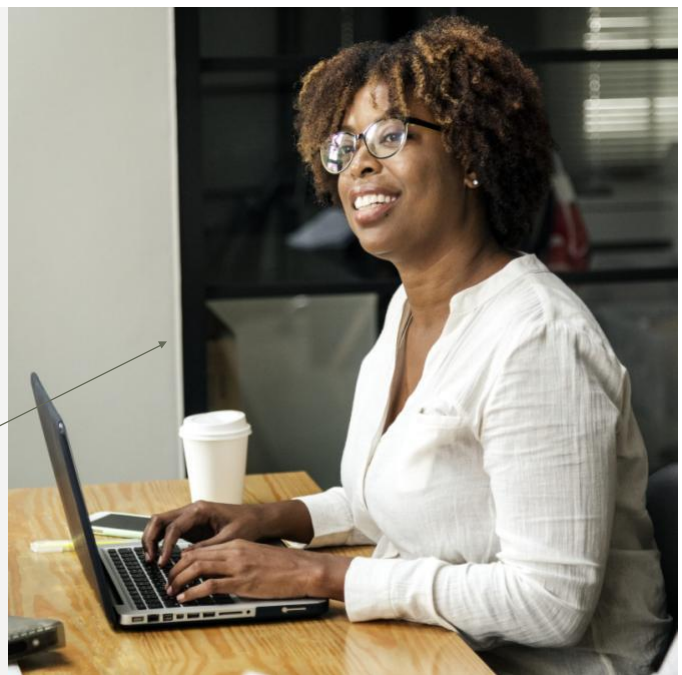
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## Best Practices

- Check angle of screen for neck posture
- Stretch break every hour
- Fidget, wriggle, and squirm



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# BETTER

Mid-long duration (2 to 8 hours)

- Neck posture good (check display angle)
- Shoulders back, elbows at 90-ish degrees
- Wrists elevated – no point pressure
- Inexpensive laptop riser, keyboard, mouse

## Best Practices

- Alternate mouse between right and left hand
- Stretch break every hour



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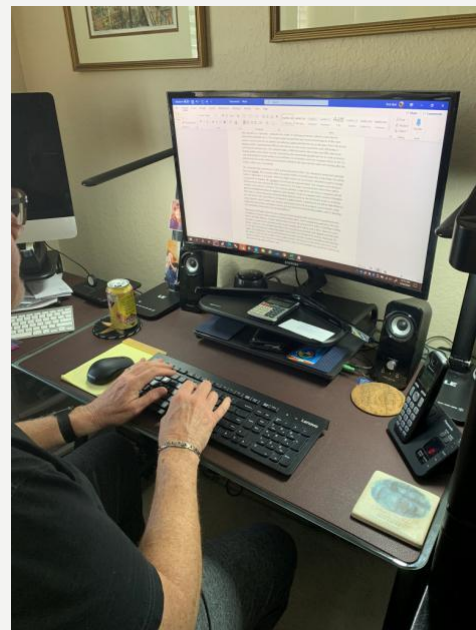
# BETTER

Mid-long duration (2 to 8 hours)

- Wrist and elbow position
- Watch and jewelry – no pressure on desk
- Mouse use (left hand) . 😊
- Organized work space

## Best Practices

- Stretch break every hour
- Fidget
- Alternate mouse between right and left hand



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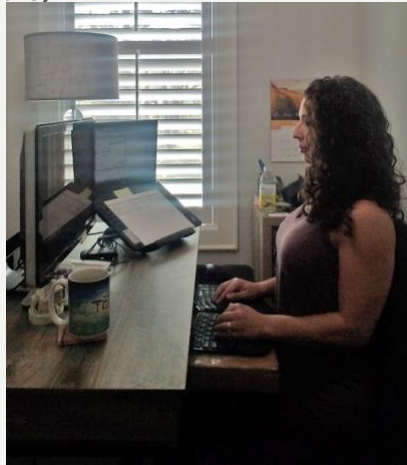
# BETTER

Mid-long duration (2 to 8 hours)

- Wrist and elbow position
- Shoulders back
- Central monitor in front
- Laptop riser
- Feet flat on floor

## Best Practices

- Stretch break every hour
- Fidget
- Alternate mouse between right and left hand



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 A large, high-angle photograph of a red smartphone lying flat on a white surface. The screen is off and reflects the ambient light.
 

# CELL PHONE OR TABLET

Used everywhere!

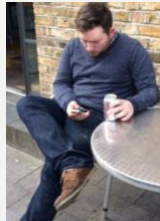
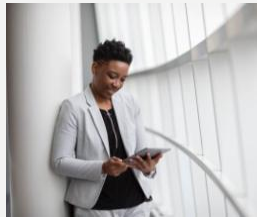
 A smaller inset image in the bottom left corner shows a person's hands holding a tablet. The tablet screen displays a dashboard with several charts, graphs, and data points.

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# SOME THINGS NOT TO DO

... other than for a few seconds to scan an email heading or image

- Neck flexion / posture

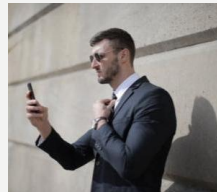


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# BETTER

Short duration

- Improved neck position
- Elbows against body
- Minimal neck flexion



## Best Practices

- Some shoulder stress – so temporary
- Position elbows closer to body
- Periodically outstretch arms
- “Pop socket”
- Headset
- Tabletop
- Stretch break every hour
- Fidget



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# BETTER++

## Short duration

- Improved neck position
- Device supported



## Best Practices

- Temporary positions
- Headset for calls
- Seated ☺



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## BEST PRACTICES SMART PHONE / TABLET

- When sitting, maintain comfortable and natural posture
- When holding the tablet, keep your elbows close to your body and vary the tablet position. Limit activities that may cause neck problems – when possible, bring your phone closer to eye level
- Switch hands to keep neck postures – healthy
- Limit postures that cause you to lean or hunch forward
- Take a short (1-2 minute break) for every 15-30 minutes
- Integrate stretching of your neck muscles regularly – take a short (1-2 minute break) for every 15-30 minutes. Take regular breaks from prolonged sitting
- Don't cradle phone
- Support arm

## Additional

- Lightly tap the tablet (virtual) keyboard
- If EMR / EMF concerns
  - Use unplugged and without WIFI & Bluetooth

## Texting

- Speakerphone or headset
- Voice-text function for occasional breaks
- NEVER text while driving

### The burden of staring at a smartphone

Effective weight on the spine as forward tilt increases

0°	15°	30°	45°	60°
12lb	27lb	40lb	49lb	60lb



Guardian Graphic. Source: Surgical Technology International

25 pounds = an average 2 year old | 33 pounds = a cinder block

36 pounds = a mid-size microwave | 40 pounds = a 5-gallon bottle of water

50 pounds = a small bale of hay | 55 pounds = a 5000 BTU air conditioner

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## COACHING

- Ergonomic change can be difficult
  - Pushback, denial, victim, other factors including employment (quiet- quitting)
- Provide education – is there the opportunity for an aha moment
- Importance of posture, movement, and away from work activities
- Stretching – how often and for how long
- No “magic wand.” People should know that any discomfort can take a number of weeks to improve
- Don’t forget about alternating between right and left hand
  - Frequently missed by doctors and healthcare providers
- **Positive attitude improves outcomes**
  - **Most people that undergo an assessment will improve, but there is some homework**



## POLLING QUESTION

## HOW DO YOU COMPARE (2 YEARS OF DATA)

### What neck position is most common for you using phone/tablet?

Poll Results (single answer required):

Neutral	3%
15 degrees	33%
30 degrees	38%
45 degrees	25%
60 degrees	3%

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Effective weight on the spine as forward tilt increases

0°	15°	30°	45°	60°
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## GENERAL BEST PRACTICES

Non-ergonomic safety and common sense tips

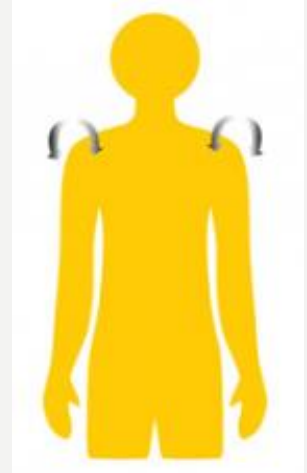
- Use electrical cords in good condition and away from heaters
- If necessary, use a surge protector with enough outlets
- Keep flammables like trash, paper, chemicals from surge protectors & cords
- Minimize trip hazards (cords, toys, tools, laundry, other hazards)
- Reasonably free of distractions
- Smoke detector / fire extinguisher available



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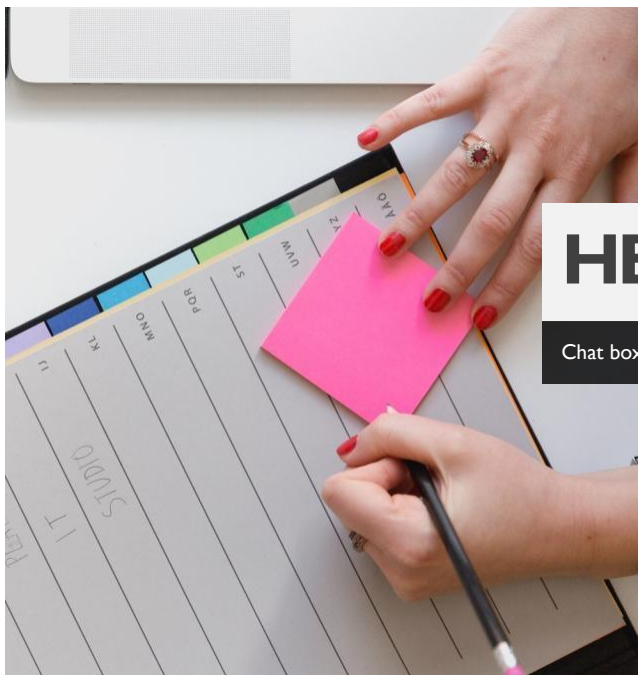
## BEST PRACTICES – ERGO CHAMP ©

- **E**RGO BREAK. Take a short (3-5 minute break) for every hour of sitting
- **R**EMOVE or lower armrests from chair – especially if they block arm motions or prevent from being close enough to keyboard, pad, or mouse
- **G**O gentle on yourself – ergonomics is not a perfect science
- **O**UTSIDE the box thinking – it's ok use common sense. For example, rotate between your right and left hand for mouse use
- **C**OMFORT. Find your place of comfort. Is it sitting with back support; unsupported sitting more forward, or is it a combination of both
- **H**ANG the arms straight down at your side for 60 seconds every hour
- **A**CTIVITY. Use ergo techniques for away-from-work activities
- **M**IX it up. Your base position of comfort is your go-to place... but it's ok to occasionally hunch, or bend, or tilt throughout the day
- **P**OSTURE. Integrate GREAT POSTURE! Head sitting upright on your shoulders, and shoulders over your hips



Arms hanging straight at side

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## HELP US IMPROVE

Chat box or question

Tell us one thing you learned today

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## REFERENCES AND RESOURCES

- Self Assessment Form
- At-home safety checklist
- General Ergonomics Solutions - ERGOhealthy ©
  - Recommendations you can use in addition to today
- Stretch and Flex – Marines
- ERGOhealthy 12 Steps of Self Care by Kate Montgomery ©
- Copy of this presentation
- Break reminder apps
  - StandApp (iOS)
  - Stand Up! The Work Break Timer (iOS)
  - Move - Daily Activity to Stay Healthy (iOS)
  - Randomly RemindMe (Android)

