

Ergonomics: You, Your Computer, Tablet and Smartphone

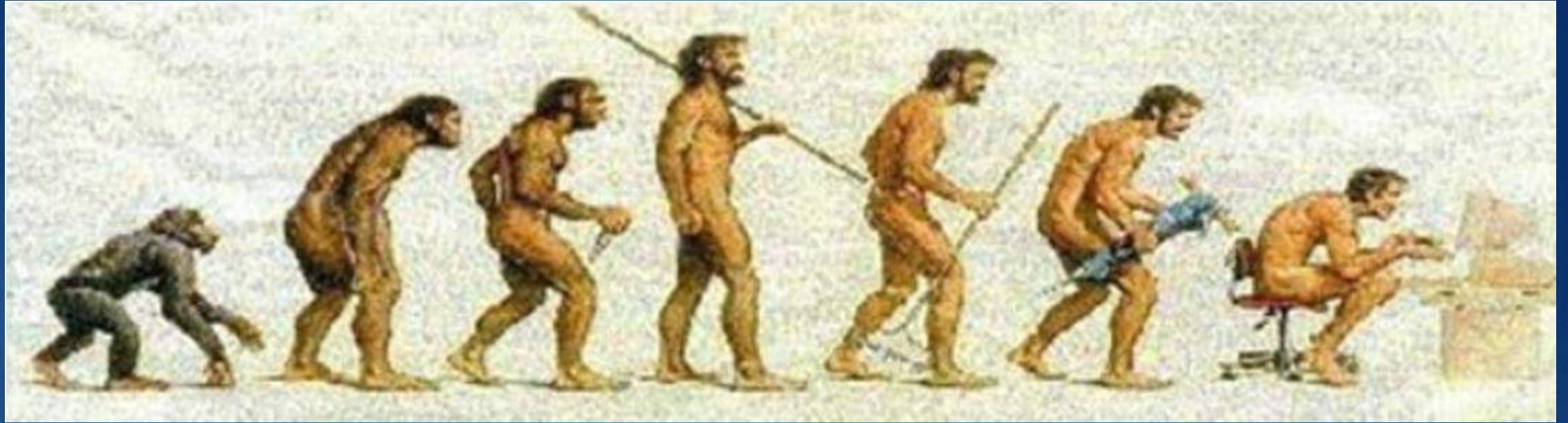
The Senior Computer User Group of
Greater Kansas City (SenCom)

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SCV Computer Club

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Ergonomics 101

- ▶ Because of the time we spend at our computer
 - ▶ It is important to understand that medical problems can result from using the computer incorrectly
- ▶ There are two main medical conditions that can occur from improper computer usage
 - ▶ Computer Vision Syndrome (CVS)
 - ▶ Repetitive Strain Injury (RSI)

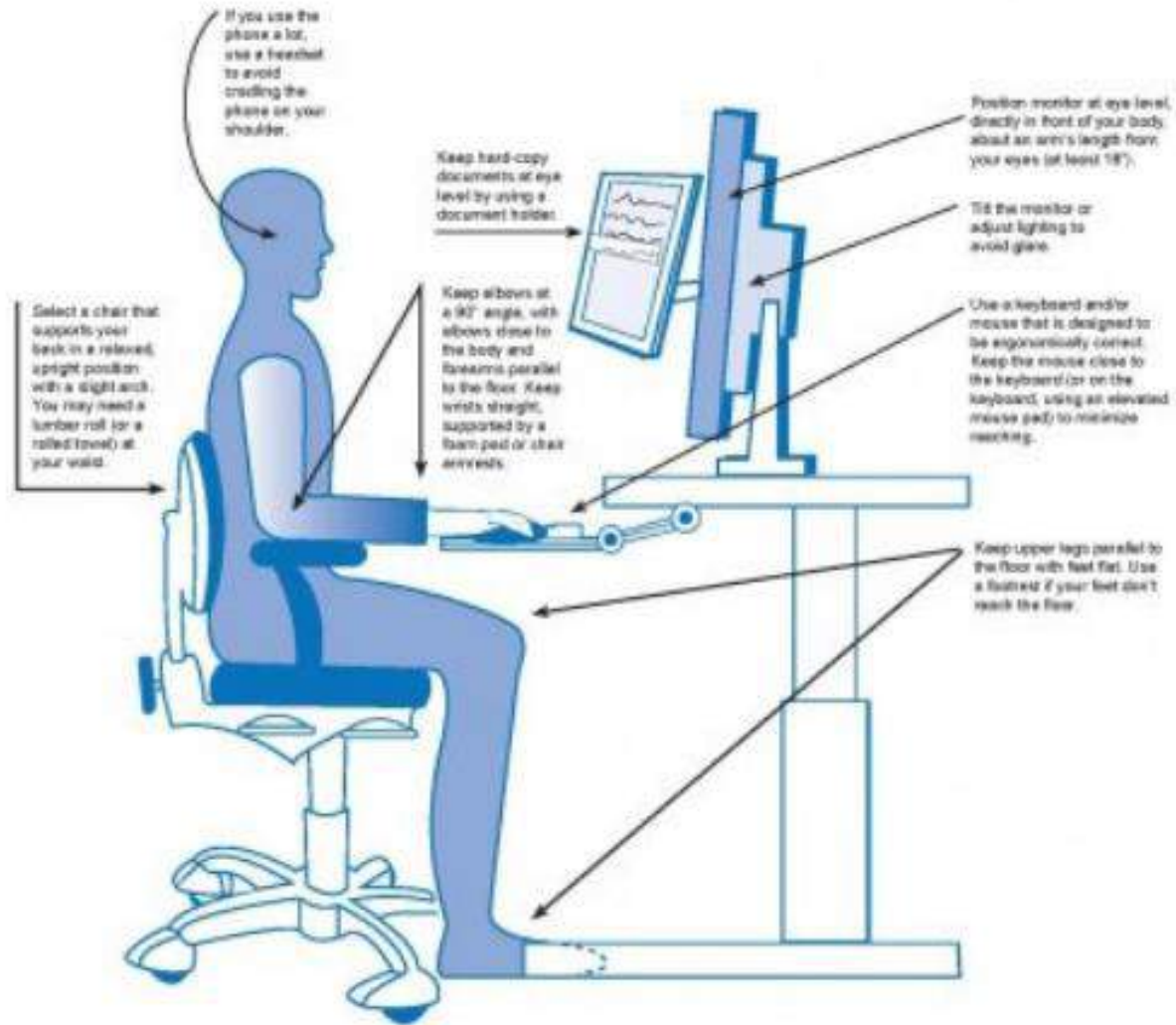


The Chair

- ▶ Chair should support back in an upright and relaxed position
- ▶ Back of chair doesn't provide enough support?
 - ▶ Try putting a rolled towel or custom cushion between small of back and chair
- ▶ Height should allow you to have your feet resting firmly on floor with thighs roughly parallel to floor
- ▶ Chair too high? Use a footrest to keep knees and hips level

Arrange Your Workstation

Every time you work, take time to adjust workstations that aren't quite right in order to minimize awkward and frequently performed movements.



The Chair

- ▶ Human body not made to sit still for long periods of time
- ▶ Get up and move around as much as you can
- ▶ At least once an hour
- ▶ Roll your shoulders
- ▶ Rotate your head from side-to-side



What is Computer Vision Syndrome?

- ▶ CVS is a group of eye and vision problems that are a result of prolonged use of a computer
- ▶ Most CVS symptoms are only temporary and will go away after we stop using the computer
 - ▶ Unlikely to happen

What causes CVS?

- ▶ Poor lighting
- ▶ Glare on computer screen
- ▶ Improper viewing distances
- ▶ Poor sitting posture
- ▶ A combination of all the above

What are the symptoms of CVS?

- ▶ Eyestrain
- ▶ Headaches
- ▶ Blurry vision
- ▶ Dry Eyes
- ▶ Neck and shoulder pain

How can I protect myself?

- ▶ Good posture
 - ▶ Feet flat on floor
 - ▶ Upper back naturally rounded
 - ▶ Shoulders and arms relaxed

How can I protect myself?

Monitor

- ▶ Centered in front of you
- ▶ Eyes should be level about 1-2" from top of screen
- ▶ Remember to blink!
- ▶ Healthy eyes should blink 15 times per minute
- ▶ Computer users? 1/3 as often

How can I protect myself?

Monitor

- ▶ Look into distance to stretch your eyes
- ▶ Follow the 20-20-20 rule
 - ▶ Look away from the screen every 20 minutes
 - ▶ Look at something 20 feet away
 - ▶ For about 20 seconds
 - ▶ Blink often to keep your eyes moist

How can I protect myself?

Monitor

- ▶ Computer glasses – single vision
 - ▶ Reading prescription
 - ▶ Usually focal length your body is from monitor
 - ▶ Arms length?
- ▶ Non-glare coating

How can I protect myself?

Monitor

- ▶ Work station / home station
- ▶ Computer / Reading = bifocals
 - ▶ Computer on top / reading on bottom

How can I protect myself?

Monitor

- ▶ Glare and reflection
 - ▶ Reposition monitor
 - ▶ Adjust blinds/curtains
 - ▶ Where is your light?
 - ▶ Glaring on your screen?
 - ▶ Increase brightness and contrast
 - ▶ Increase font size

How can I protect myself?

Monitor

High contrast

Make text and apps easier to see by using more distinct colors.

Use high contrast

Turn on high contrast



Press left Alt + left Shift + Print Screen to turn high contrast on and off.

Choose a theme

High Contrast Black

Select a colored rectangle to customize high contrast colors



Text



How can I protect myself ?

Monitor

- ▶ Cursor and pointer size
 - ▶ Settings > Accessibility > Cursor & pointer size

Cursor & pointer size

Make pointer, cursor, and touch feedback easier to see.

Make the cursor easier to see when typing

Change cursor thickness



Change pointer size and color

Change pointer size



Change pointer color



How can I protect myself ?

Monitor

► Display

- Settings > Ease of Access > Display



Display

Make your display easier to see.

Make text bigger

Sample text

Drag the slider until the sample text is easy to read, then click Apply



Apply

Make everything bigger

Change the size of apps and text on the main display

150%



How can I protect myself ?

Monitor

- ▶ Night Light
 - ▶ Settings > System > Display “ Night light

Display

Brightness and color

Change brightness



Night light (on until 7:00 AM)



[Night light settings](#)

How can I protect myself?

Monitor

🏠 Night light settings

Screens emit blue light, which can keep you up at night. Night light displays warmer colors to help you sleep.

On until sunrise (7:00 AM)

Turn off now

Color temperature at night



Schedule

Schedule night light



On

Turn on Location services to schedule night light at sunset.

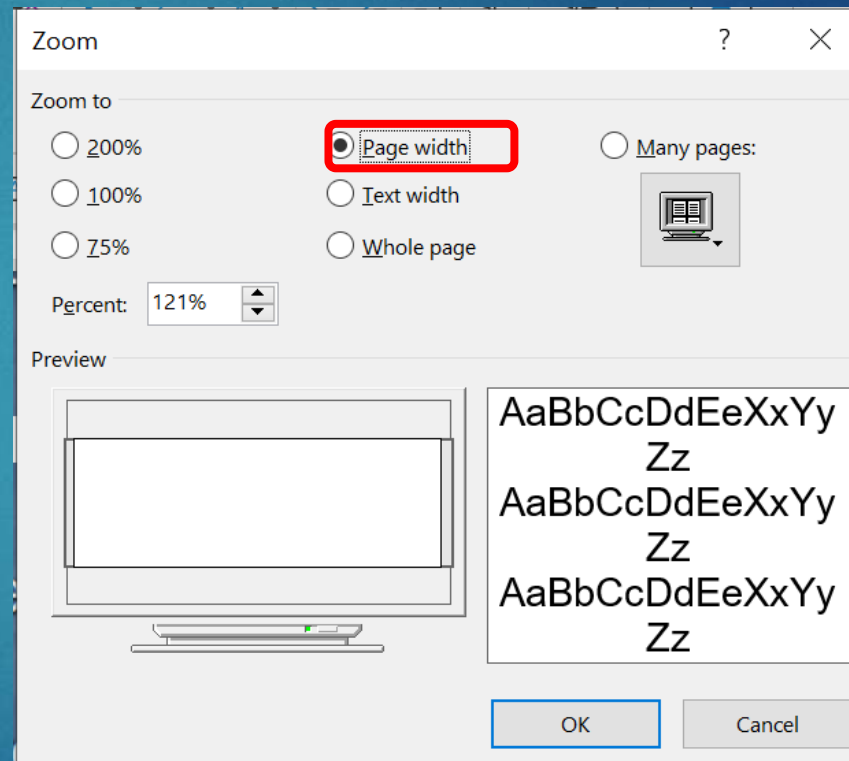
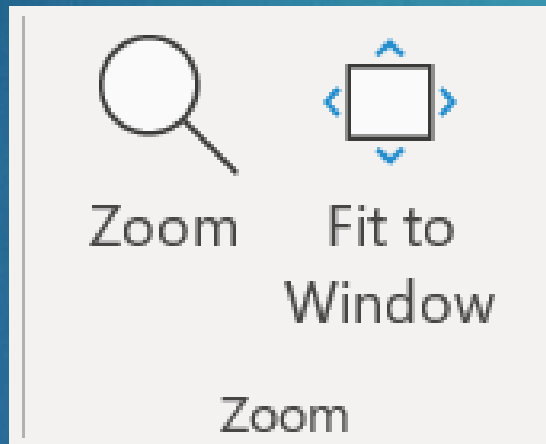
[Location settings](#)

How can I protect myself ?

Monitor

► Word

► View >





Now, that's more ergonomic...

What is Repetitive Strain Injury (RSI)?

- ▶ Syndrome that affects muscles, tendons, and nerves in
 - ▶ Hands
 - ▶ Arms
 - ▶ Upper back

What causes RSI?

- ▶ Areas are kept tense for very long periods of time
 - ▶ Due to poor posture
 - ▶ Repetitive motions

What are the main types of RSI?

- ▶ Carpal Tunnel Syndrome
- ▶ Tendonitis
- ▶ Bursitis
- ▶ Mouse shoulder
- ▶ Tennis elbow

Carpal Tunnel Syndrome

- ▶ Nerve in wrist is used over and over with wrong equipment
- ▶ Causing stress in nerves and tissue in wrists
- ▶ Can be prevented by using the correct equipment
 - ▶ To help keep wrist in correct position

What are the warning signs of RSI?

- ▶ Pain or soreness in your
 - ▶ Hands
 - ▶ Wrists
 - ▶ Neck
 - ▶ Shoulders
 - ▶ Upper Back

What are the warning signs of RSI?

- ▶ Intermittent numbness, tingling and pain
- ▶ Side of hand – including thumb through inside of ring finger
- ▶ Hand's communication with brain is disrupted
- ▶ Fingers have difficulty sensing temperature and gripping objects

Treatment for RSI

- ▶ Significant changes to work habits
- ▶ Therapy treatment
- ▶ Surgery

How can I protect myself?

Keyboard

- ▶ Feet up or flat
- ▶ Keys should work with a light touch
- ▶ Pressing too hard?
 - ▶ Jarring effect on lower arm, wrist or knuckle problem

How can I protect myself?

Keyboard

- ▶ Positioned so you can reach keys with elbows at our side
- ▶ Laptop?
 - ▶ Keyboard not ergonomically correct
 - ▶ Add a wireless keyboard and mouse

How can I protect myself?

Keyboard

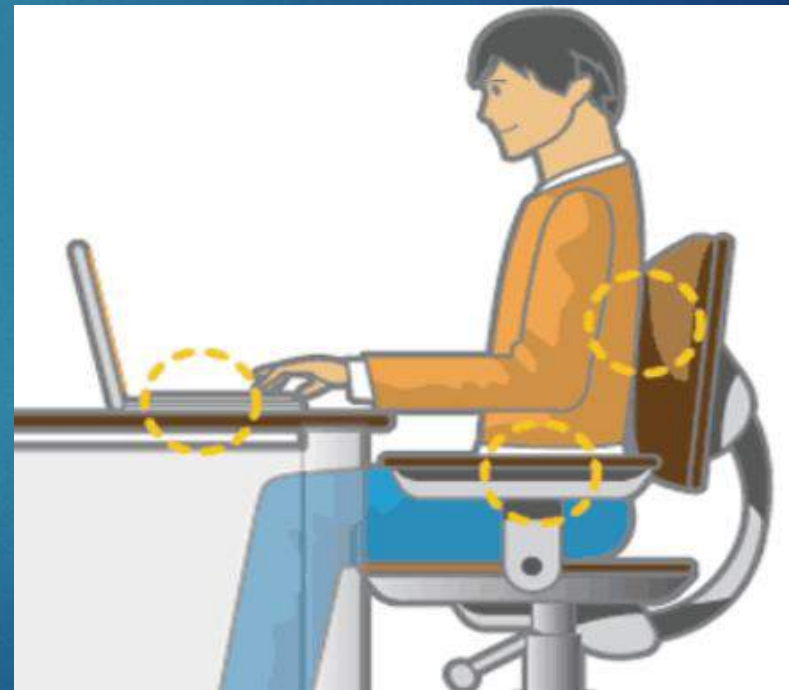
- ▶ Wrist rest?
- ▶ Do not rest wrists on it when typing
 - ▶ It's for breaks
- ▶ Wrists floating over keyboard
- ▶ Fingers curved
- ▶ Thumbs hanging near the spacebar



How can I protect myself?

Keyboard

- ▶ Arms/wrists parallel to the floor or down
- ▶ Up? – carpel tunnel



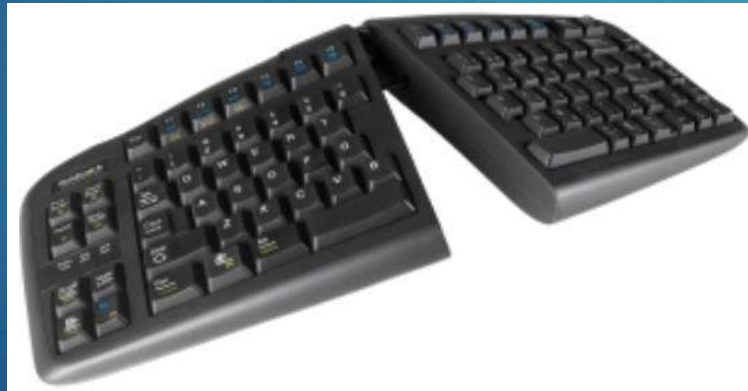
Ergonomic Keyboards



Microsoft Sculpt - \$50



Fellows Split Design - \$50



Goldtouch Adjustable - \$85

Keyboards



Logitech 320

\$40 – on sale less than \$30

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"If your typing slows down, the special ergonomic keyboard injects coffee directly into your fingertips."

How can I protect myself?

Mouse

- ▶ Cold muscles and tendons are at greater risk of injury
- ▶ At one side without having to reach or hunch
- ▶ Close to keyboard
- ▶ Use elbow, not wrist, to move mouse

How can I protect myself?

Mouse

- ▶ Wrists in straight or neutral position
- ▶ Light grip
- ▶ Use a wrist rest
 - ▶ Supports your wrist



How can I protect myself?

Mouse



IMAK Cushion Ergobeads
Wrist Rest, Heather Gray



Kensington® Wrist Pillow®
Gel Mouse Pad Wrist Rest,



Fellowes® Antimicrobial
Photo Gel Wrist Rest,



KellyREST Viscoflex Foam
Wrist Rest, Black

How can I protect myself?

Mouse

- Use an ergonomic mouse

17% off



Logitech MX Ergo Plus
Advanced Wireless

1Each

40% off



Logitech M570 910-
001799 Wireless Trackball

1Each



Adesso iMouse E1 Vertical
Ergonomic Illuminated

1Each



Adesso iMouse E10 2.4
GHz RF Wireless Vertical

1Each



SIIG® Optical Wireless
Ergonomic Mouse, Blue

1Each



Smartphone and Tablet Ergonomics

Smartphone and Tablet Ergonomics

- ▶ Can you think of something that can't be found, bought, or watched online
- ▶ Using your smartphone or tablet
- ▶ It's not surprising that many of us develop a dependency on our tablets or smartphones
- ▶ Each day people spend hours looking down at hand-held devices

Smartphone and Tablet Ergonomics

- ▶ Frequent overuse of such technology along with poor ergonomics can be responsible for a number of health issues
- ▶ Joints
- ▶ Muscles
- ▶ Nerves
- ▶ Ligaments, etc.

Holding Your Devices

- ▶ Use of hand-held devices linked to cases of ill-health and sickness
- ▶ Hold or position the device at eye level
- ▶ Head tilting forward?
 - ▶ Puts a great deal of force on your neck
 - ▶ Neck houses your spinal cord which sends messages from the brain to all areas of your body

Holding Your Devices

- ▶ Holding device directly in front of you, your head retains its healthy and neutral position
- ▶ Minimizes strain on your neck
- ▶ If you can't do this, move your eyes to look down – not your neck

Texting Neck

aka Anterior Head Syndrome



Tension Headache →
Neck and shoulder pain →
Difficulty breathing, pain in →
middle of back, chest, and lower back





Holding Your Devices

- ▶ Folding case tablet stand
- ▶ Easy-grip case
- ▶ Portable ergonomic keyboard
- ▶ Earphones with built-in microphones
- ▶ Hands-free sets and auxiliary cords

Holding Your Devices



Holding Your Devices



Holding Your Devices



Holding Your Devices

- ▶ Only using thumbs to type can lead to RSI
- ▶ Repeated pressing of buttons, virtual or on a keypad, will cause onset of pain in thumbs and wrists
- ▶ Alternating between thumb and fingers to type may seem unnatural at first but doesn't take too long to master
- ▶ Turn device on side to reveal a larger keyboard

Holding Your Devices

- ▶ Texting Thumb is a repetitive stress injury that affects the thumb and wrist
- ▶ Form of tendonitis
- ▶ Pain and sometimes a popping sound are present on the outside of the thumb at or near the wrist
- ▶ There can also be a decrease in grip strength or range of motion



Holding Your Devices

- ▶ Keep wrists as relaxed as possible
- ▶ Wrists should be straight and relaxed using a comfortable neutral grip of the device
- ▶ Bent or twisted?
 - ▶ Will cause strain in wrists but fingers and thumbs will have to work harder

Holding Your Devices



Holding Your Devices

- ▶ Smartphones and tablets are usually equipped with a number of adjustable settings ideal for ergonomics
- ▶ Reduce brightness when in a dimly lit or dark environment to reduce headaches and eyestrain
- ▶ Adjust size of displayed text
- ▶ Options to bold text, use magnifier camera tool, contrast tuning and zoom

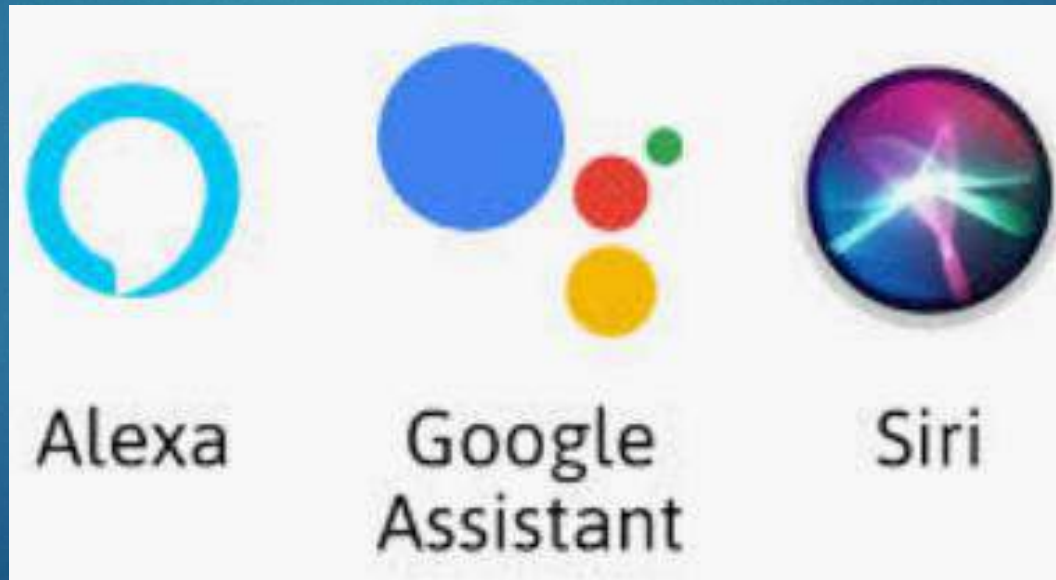
Holding Your Devices

- ▶ Siri, Alexa, or Google can carry out various actions via voice instructions including
- ▶ Composing and sending texts
- ▶ Calling contacts
- ▶ Adding reminders to calendars
- ▶ Searching Internet



Holding Your Devices

- ▶ You will control your device without even having to touch it, eliminating all risks or related injury



Decrease amount of time spent on devices

- ▶ Many of us have made checking our gadgets every few minutes a habit
- ▶ Set an alarm for checking whatever you do
- ▶ Start with once an hour
- ▶ Increase, over time

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**"To meet our goal, we'll have to work our butts off.
Make sure everyone gets a pair of ergonomic underwear."**

Exercises

Exercises

Neck and Shoulders

- ▶ **Neck Rotation:** Slowly rotate your head as far as comfortable to the right, then left.
- ▶ **Shoulder Rotation:** Circle your shoulders, then reverse directions.
- ▶ **Head Side to Side:** Bend your neck so left ear approaches left shoulder, then repeat for right. Add a little resistance by pressing your hand against the side of your head.

Exercises

Neck and Shoulders

- ▶ **Chin Tuck:** Slide your chin inward, without bending your neck up or down. This is easiest to practice initially against a wall. Tuck chin in, attempting to touch back of neck to the wall while also maintaining head contact. Don't jam your chin down to your chest.
- ▶ **Shoulder Blade Retraction:** Pull your shoulders down and back.
- ▶ **Shrug:** Slowly raise your shoulders toward ears and hold for a few seconds. Gradually bring shoulders down and relax.

Exercises

Back

- ▶ **Shoulder Squeeze:** Raise your arms in front of body, with elbows bent and thumbs up. Pull elbows back, squeezing shoulder blades together. Hold for a few seconds then release.
- ▶ **Stretch Up:** Sit up straight and imagine a cable attached to the top of your head. Gradually stretch to be as tall as possible, hold for a few seconds, then relax.

Exercises

Arms

- ▶ **Arm Relaxation:** Drop your arms and hands to your sides. Gently shake them for a few seconds.
- ▶ **Arm Rotation:** Raise your arms in front of your body. Rotate arms so palms face up, then rotate so backs of hands face each other.

Exercises

Hands / Wrists

- ▶ **Wrist Flex:** With your elbows on desk, gently use left hand to bend right hand back toward forearm. Hold for a few seconds, then relax. Repeat on other side.
- ▶ **Touch each finger with thumb:** Repeat start with pinky and then with pointer
- ▶ **Finger Fan:** Spread your fingers as far apart as possible, hold, then clench fists, then release.

Exercises

Feet

- ▶ **Toe Curl:** Flex toes up, then curl toes under. Release.
- ▶ **Foot Rotation:** Circle foot slowly from the ankle, then reverse.

Exercises

Eyes

- ▶ **Eye Rolls:** Roll your eyes clockwise then counterclockwise briefly.
- ▶ **Palm Eyes:** Without touching your eyes, cup hands lightly over eyes for 30 seconds to rest them from light.
- ▶ **Look Away:** Exercise your eyes by periodically looking away from your computer to focus on distant objects.
- ▶ **Blink**

Resources

- ▶ <https://www.uhs.umich.edu/computerergonomics>
- ▶ <https://www.techrepublic.com/article/10-ergonomic-tips-to-immediately-improve-your-workspace/>
- ▶ <https://www.howtogeek.com/354902/how-to-get-started-with-a-standing-desk/>
- ▶ <https://www.midwestmedicaledition.com/2017/10/27/158535/smartphone-ergonomics-heres-how-to-protect-your-neck-back-and-hands>

Resources

- ▶ <https://www.reviewgeek.com/2708/4-great-phone-grip-and-kickstands-for-your-smartphone/>
- ▶ <https://www.allthingsergo.com/ways-use-smartphones-tablets-ergonomically/>