

Ergonomics and the whole child

Working to help prevent or eliminate spinal injuries/pain associated with poor ergonomics

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What is Ergonomics?

Ergonomics is the science of **fitting the environment to the individual's needs**, not the other way around.



How does ergonomics impact the health of our body, specifically the spine?

Factors

- Lack of movement
 - Sedentary lifestyles
- Use of screen-based activities
 - Increased risk for obesity
- COVID-19 pandemic
 - Increased amount of time kids spent on screens.
 - Incorrect sitting postures

Results

- Musculoskeletal disorders
- Increased stress on cervical spine "Text Neck"
- Changes in posture resulting in pain
- Anatomical changes
- Higher chance of chronic pain as an adult
- Hyper kyphosis
- Headaches
- Visual Strain eye problems



Typical Postures for Children & Teens with smart devices and screens



Cell Phones



Gaming



Homework









Tablets



Upper Quadrant Musculoskeletal Pain (UQMP)



- Musculoskeletal pain in neck and back
 - Referred pain may be from periscapular area
- Higher prevalence in girls
- Increases with age
- Multi-factorial in nature
 - Psychosocial elements
 - Lifestyle
 - Physical activeness
 - Postural elements
 - Joint hypermobility
 - Poor body awareness
 - Environmental elements



"Children who use more than 1-2h per day of technology have an increase of almost 60% in psychological disorders."

Meats,J 2021



"Text Neck"



Full grown head =10-12 lbs of force on spine in neutral position ->neck flexes increases force on the spine = 60 lbs

- Cervical spinal degeneration
- More common in teens
- Kids heads are larger in proportion to their body compared to adults



Complications of Text Neck

- Trapezius muscle gets over worked
- Referred pain from periscapular
- Headaches
- Hyper kyphosis- impacting breathing
- Increased psychological disorders
- No unified tool for measuring musculoskeletal pain in the neck

- Computer furniture is not ideal for our child users.
 - Desk height
 - Chair
 - Monitor height
 - Postural hygiene
 - Informal seating arrangements
- Lack of education about importance of posture – teachers, parents, kids
- Kids do not take the long-term damage to the body seriously



Prevention of Neck Issues

- 1. Avoid excessive usage and take frequent breaks
 - Every 30 min physically active and meaningful
 - Also provides a visual break for the visual system
 - No more than 60 min without a break from the computer
 - Not to watch touch-screen devices over 2h/day
- 2. Avoid prolonged static postures
- 3. Position device without using excessive neck flexion
- 4. Avoid high repetitions of movement swiping
- 5. Avoid holding large cell phones or tablets in one hand for long duration

Good Working Positions

Rady Childrens

> Maintaining a neutral body position helps reduce stress and strain on the muscles, tendons, and bones, and reduces your risk of injury.





Good Working Positions





Body Positions During Screen Time



Change position often. Staying in one position for too long stresses muscles and joints





Place a cushion underneath device to decrease strain on body

Propping up the device on a table or other surface can help





Ergonomic Screening

Type of Computer

- Laptop
- desktop
- tablet

Location

- Dining room table
- desk
- bed

Seating

- Dining room chair
- office chair
- bed

Mouse

- Regular
- ergonomic
- ball mouse

Keyboard

- Separate
- ergonomic
- laptop/tablet

Time spent on computer before a break

• ___hours/____min

Amount of time for break

• ___hours/____min

How long before pain starts

____hours/____min

Exercise Routine:

Stretching:

Comments:

Recommendations:





What Can Be Done to Prevent Injury?

- Make small adjustments to the chair or backrest
- Avoid Contact Stress, such as:
 - Leaning wrists on edge of desk
 - Planting wrists while typing
 - Leaning on elbow or armrest while talking
- Avoid excessive Neck Flexion
- Organize the workspace to be the most efficient for your tasks
 - Are frequently used items within easy reach?
- Avoid long periods of repetitive activity
 - Alternate tasks, break up the work
- Take a physically active break every 30 min that is meaningful
 - 60 min is maximum time at computer without a break
 - Can even be movement with the hips/pelvis while seated
- Move, Move, Move!



Recommended Positions to Avoid











Accommodations for improved body position during use of smart devices















On bed







Ergonomic Equipment





Exercises

cervical retraction: places your neck in a position of tension while actively stretching the muscles and connective tissues.

cervical extension: stretches the neck in the opposite direction

scapular stabilization: helps strengthen the shoulder muscles to support and stabilize the neck. One of the most beneficial exercises, called scapular retraction











Nerve Glides "Spiderman"

Starting Position: Bring your hand to face level

Ending Position: While turning your head to follow you hand, reach sideways, palm up, keeping your hand at eye level. At the end of your reach tilt your fingers towards the floor

Perform 3x's/ 3 sets per day





Median/Ulnar Nerve Glide





Starting Position: arms at sides and bend elbows to a 90 degree angle with palms facing up. Shoulders are in a relaxed position

Ending Position: Shrug shoulders up towards ears while straightening elbows and bending wrists back, palms facing the floor Keeping a fluid movement pattern, alternate between the 2 positions

Repeat 3x's / 3 sets per day





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