

Repetitive Strain Injuries among Children's

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Abstract: *Repetitive Strain Injury (RSI) is a potentially debilitating condition resulting from overusing the hands to perform a repetitive task, such as typing, clicking a mouse, or writing. Anyone who uses a computer regularly is at risk and should know about RSI. Unfortunately, most people are uninformed and do not understand what RSI is or how serious it can be.*

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1. Introduction

Definition-Repetitive stress injuries (RSIs) are injuries that happen when too much stress is placed on a part of the body, resulting in inflammation (pain and swelling), muscle strain, or tissue damage. This stress generally occurs from repeating the same movements over and over again.

RSIs are common work-related injuries, often affecting people who spend a lot of time using computer keyboards.

Common conditions that children and teens can develop include tendonitis, bursitis, and even Carpal Tunnel Syndrome.

- **Tendonitis** – inflammation of a tendon.
- **Bursitis** – inflammation of a bursa, a pouch or vesicle containing synovia to facilitate motion between a tendon and a bone.
- **Carpal Tunnel Syndrome** – a common disorder of the wrist and hand characterized by pain, tingling, and muscular weakness, caused by pressure on the median nerve in the wrist area.

Each of these conditions causes pain and swelling of the joints and if left untreated can result in temporary or long-term restriction of motion of those joints. Teens are especially at risk since they tend to exacerbate injuries where growth plates occur, a place where the bones regenerate and get longer.

The two most common behaviors linked to RSI in children are:

Overuse of Technology

Computers, video games, and cellular phones are all linked to extended keyboard use known to lead to tendonitis, bursitis and carpal tunnel syndrome. Proper posture is essential with wrists and lower arms making a 90-degree angle with the upper arm. Feet should be rested flat on the floor. If the child or teen has trouble reaching the floor with their feet, add a footrest.

Computers are generally designed to fit adult bodies, so their very use can cause injuries in children. Having a monitor too high or a keyboard just out of reach can cause discomfort and injuries over time. An adjustable monitor arm can make monitor height and distance easily adjustable across different body sizes. An adjustable office chair with ergonomic features such as lumbar support will encourage

proper posture. A child or adolescent's head should be parallel to the top of the screen.

Constant text messaging also contributes to hand and wrist injuries. Children and teens should try to avoid texting for extended periods of time and should stop if they begin to feel discomfort or pain. Alternating hands can help remove stress from some joints.

Carrying Too Much Weight

Overloaded backpacks are a known problem for children and teens. At most, a child should only carry 15 – 20% of his or her body weight in a backpack. Some doctors may even recommend only 10% of their body weight to ensure a safe weight that doesn't harm the spine or lower back. Heavy items should always be placed at the bottom of the backpack to even the load. If possible, leave any items not needed for a few hours in a locker or classroom.

An ergonomic backpack has a structure that can help prevent back injuries. Wide, padded straps help to distribute weight across the shoulders and a waist strap shifts the weight to the hips. Additional smaller compartments keep the weight evenly distributed across the backpack and keep them in place.

Increase in academic pressure and the use of technological devices in school have left children and adolescents vulnerable to developing RSIs now more than ever. Parents and teachers can help prevent injuries through teaching proper techniques and postures as well as increasing the use of child friendly ergonomic equipment.

Current scenario in India

Early identification of RSI and competent medical intervention is critical to arrest and reverse the injury in its early stages. Unfortunately, Indian medical professionals (in general) are not equipped to diagnose or treat RSI's, since it is a relatively recent phenomenon here. Ergonomics, RSI and Myofascial Disorders do not even find a passing mention in the Indian Medical Curriculum and it is not unusual to find Indian doctors (even specialists) and physiotherapists who have not even heard of RSI, let alone have the ability to treat it.

Top pitfalls in RSI Treatment in India

- 1) **Misdiagnosis** as "Spondylitis, "Arthritis, " "Slipped Disc, " or "Muscle Sprain" seems to be the rule rather

than an exception. Diagnosis of RSI is entirely based on a skilled musculoskeletal examination by an expert, and no "special" tests including MRI scans or nerve conduction studies can reliably diagnose it.

- 2) **Inappropriate medications**, e. g., corticosteroids (or Cortisone), antidepressants, Vitamin B12 and multi-vitamins, Unspecified Health Pills and Oils, etc. Medicines and potions (whether Allopathic or Alternative) make little difference in the long term.
- 3) Conventional **physiotherapy** is usually **ineffective** (Ultrasound, Short Wave Diathermy, etc.) and sometimes **dangerous** (traction and isometric/resistive neck exercises).
- 4) **Inappropriate surgery** for a presumed diagnosis of Carpal Tunnel Syndrome or Slipped Disc, with disastrous consequences.
- 5) **Total reliance on fancy ergonomic gadgetry**, special chairs, wrist rests, split keyboards, antiglare screens, etc. to prevent RSI, while ignoring human factors (e. g., practical training in posture, body awareness, typing technique, breaks)

Preventing RSIS

Preventing Computer-Related Injuries

To prevent injuries from computer use, make sure your computer equipment and furniture fit you properly and that you use correct typing and sitting positions. If your parents are shopping for new computer furniture, suggest that they buy pieces that can be adjusted for each family member.

Here are some tips:

Make sure the top of your computer screen is aligned with your forehead.

Sit up straight with your back touching the back of your seat. Chairs that provide extra support, especially lumbar (lower back) support are helpful. Avoid slouching over your keyboard or tensing your shoulders, which can place unnecessary stress on your neck, back, and spine.

Let your legs rest comfortably with your feet flat on the floor or on a footrest. (To test whether your legs are in a good position, try placing a pencil on your knee — the pencil should roll toward your waist, not off of your knee.)

Use a light touch when typing. Place the keyboard close to you so that you don't have to reach for it.

Fingers and wrists should remain level while typing. Try a wrist rest for extra support. Your wrists and forearms should be at a 90-degree angle to the upper part of your arms. Elbows should be placed close to the side of the body to prevent bending the wrists side to side.

It's easy to lose track of time when you're surfing the Internet or immersed in a homework assignment. Be sure to take breaks (to stretch or walk around) about every 30 minutes — even if you don't feel tired or feel any pain. (If you lose track of time, use a timer so you know when you're due for a break.)

Try an ergonomic ("ergonomic" means specially designed for comfort) keyboard that has a curved design, and use a trackball instead of a mouse.

Ten easy ways to reduce your risk of developing RSI

- 1) **TAKE BREAKS!** when using your computer. Every hour or so, get up and walk around, get a drink of water, stretch whatever muscles are tight, and look out the window at a far off object (to rest your eyes).
- 2) Use good posture. If you can't hold good posture, it probably means it's time for you to take a break from typing. If you are perpetually struggling to maintain good posture, you probably need to adjust your workstation or chair, or develop some of the support muscles necessary for good posture.
- 3) Use an ergonomically optimized workstation to reduce strain on your body.
- 4) Exercise regularly. Include strengthening, stretching, and aerobic exercises. I find yoga and Pilates especially helpful.
- 5) Only use the computer as much as you have to. Don't email people when you could walk down the hall or pick up the phone and talk to them. It's not only better for your hands-it's friendlier. Think before you type to avoid unnecessary editing.
- 6) Don't stretch for the hard-to-reach keys, e. g. BACKSPACE, ENTER, SHIFT, CONTROL. Basically everything but the letters. Instead, move your entire hand so that you may press the desired key with ease. This is crucial when you are programming or typing something in LaTeX, where non-letter keys are used extensively.
- 7) Let your hands float above the keyboard when you type, and move your entire arm when moving your mouse or typing hard-to-reach keys, keeping the wrist joint straight at all times. This lets the big muscles in your arm, shoulder, and back do most of the work, instead of the smaller, weaker, and more vulnerable muscles in your hand and wrist. If you find it difficult to do this, then your shoulder and back muscles are probably too weak. It is OK, and in fact a good idea, to rest your elbows/wrists when you are not typing.
- 8) Use two hands to type combination key strokes, such as those involving the SHIFT and CONTROL keys.
- 9) When writing, avoid gripping the writing utensil tightly. Someone should be able to easily pull the writing utensil out of your hand when you are writing. If your pen or pencil requires you to press too hard, get a new one (my favorite is Dr. Grip Gel Ink)
- 10) Realize that you are not invincible. RSI can happen to you. Don't be afraid to ask for help

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