Health and Safety
Santé et sécurité

HAZARD

Repetitive Strain Injuries

What are repetitive strain injuries?

Repetitive strain injuries (RSI) are injuries affecting tendons, tendon sheaths, muscles, nerves and joints. They cause persistent or recurring pain most commonly in the neck, shoulders, forearms, hands, wrists, elbows and lower limbs.

Unlike other diseases, RSIs are not easily classified because they have a variety of causes and affect different parts of the body. A number of terms are applied to such injuries, including repetitive injury, repetitive motion injury, repetitive trauma, overuse injury, cumulative trauma disorder, occupational musculoskeletal disorder and cervio-brachial disorder. The different terms indicate that such injuries involve repetition, and can also be caused by force, rapid movement, overuse, static loading, excessive strain, uncomfortable positioning of limbs or holding one's posture in an unnatural, constrained or constricted position.

RSI: The causes

The causes can be classified in the following ways:

1. Rapid movement injuries, caused by repeated rapid movements
2. Forceful movement injuries, caused by exertion of muscle movement
3. Static loading injuries, caused by fixed positioning with unsupported limbs

Such injuries can be caused by either too little movement or excessive movement while handling light or heavy loads.

Often, repetitive strain injuries have multiple causes. Maintenance workers using a screwdriver may experience pain from the repetitive use of force while working at an uncomfortable angle. Office workers sitting in an uncomfortable position with no wrist support may experience pain from rapid finger movements across poorly designed keyboards. The effects on these workers' musculoskeletal system can result in serious injuries.

What can be done about RSIs?

Because RSIs have numerous causes affecting a variety of areas, eliminating them demands a comprehensive prevention program. The cornerstone of such a program must be to make the job fit the person rather than make the person fit the job. It should include:

1. A program to investigate and document all complaints of pain related to the workplace should be developed. A careful analysis of the workplace should be conducted to detect potential causes of RSIs. A full-scale ergonomics study can look at the force, speed and direction of movements, frequency of movements, work posture, rate of work and stress.

2. An education program outlining the source and prevention of repetitive strain injuries should be provided. Workers should be informed of the symptoms of such injuries so that they can be identified before any serious injury occurs.

3. A reporting system to ensure early symptoms are dealt with seriously and immediately. Workers should not have to put up with the pain.

4. A provision for regular rest and time-off work should be established. If the cause of the repetitive motion, trauma, etc. is eliminated, a healing process can begin. Too often workers will return to work as soon as pain disappears. This extends the problem, possibly causing a worsening of the condition. Surgery to deal with serious injury is always the last resort, especially in the case of RSIs. Job rotation, job enlargement and repeated rest breaks should be used to break up the series of repetitive motion that can lead to injury. Jobs can be redesigned to eliminate de-skilling and monotonous and repetitive tasks. Job rotation can be used to vary the muscles used in the work process.

5. Redesign tools to fit the individual or specific task. For example, some tools can be designed with smaller grips that require less power to manipulate, squeeze or press, so that hands and wrists are in the same posture as when they are hanging relaxed at one's side. Ill-fitting components should be eliminated, and machinery should be well maintained. Sometimes tools may be redesigned, but any improvement can be offset if a consequent increase in workload forces the pace to be ramped up. A mix of both tool or workplace redesign and rest breaks would be the most effective.

6. Repetitive strain injuries should be fully recognized as serious occupational injuries. Each province has different coverage under the Workers' Compensation Board.

7. Proper training for new workers should be provided if their jobs involve repetitive motion.

Who is affected?

In the past, RSIs were most commonly attributed to people involved in sports, hence the names "tennis elbow" or "golfer's elbow." These injuries were generally not recognized amongst workers, although syndromes related to specific occupations such as "weaver's cramp" and "threader's wrist" were reported. However, RSIs are increasingly common among a variety of workers

Many workers are unfamiliar with RSIs and tend to overlook any connection between their everyday aches and pains and the workplace. But aches and pains can be a warning that a serious injury is developing. If the causes are not eliminated or if the worker is not promptly reassigned, the damage may become permanent and irreversible. Sometimes such injuries are debilitating, leaving the worker in constant pain or lifelong paralysis.

Although the reports of RSIs are on the rise, there are no regulations or standards covering them.

Often, repetitive strain injuries have multiple causes. A maintenance worker using a screwdriver may get pains from repetitive use of force while working at an uncomfortable angle. Office workers may be sitting in an uncomfortable position with no wrist support and using rapid finger movements on poorly designed keyboards.

RSI: The factors

Any work that forces a person into an unnatural position can lead to RSIs. Regular work activities – such as the forceful twisting, repetitive finger movements without rest, sitting in an uncomfortable position, bending the wrists for long periods, working with arms above shoulder height, gripping tools forcefully, etc. – strain tendons, ligaments and muscles, causing injury.

RSIs are linked to the type of work activity, the tools used and the design of the work station. Other factors contributing to RSIs include excessive work rates, lack of job variation, increasing speed, poorly maintained equipment, constant or frequent vibration, stress, excessive overtime and inadequate training.

RSIs can be caused by overwork. Rapid and repetitive motions with insufficient rest can cause RSIs. This spiralling effect – coupled with stress (another contributor to RSIs) can cause injuries that might never heal without a long-term break from their causes.

What are the symptoms?

Descriptions of how RSIs feel range from "a sense of discomfort" to "excruciating pain." General symptoms include:

- numbness
- tingling and burning sensations
- pain or dull ache
- dry, shiny palms
- clumsiness of the hands (loss of ability to grasp items, impaired thumb and finger dexterity)
- swelling around the wrist and hand
- wasting of the muscles at the base of the thumb
- aches and pains which may be strongest at night

Pain in one area of the body may radiate to other connecting parts. Pain from the wrist can radiate to the forearm and the shoulder joint. If a worker has any of these symptoms, it should be reported immediately.

What parts of the body are affected?

Bones and muscles make up what is known as the musculoskeletal system. The bones, connected by joints, serve as levers for the muscles to act upon. Tendons anchor muscles to the bones, and ligaments connect two or more bones, cartilages or other structures. Any activity that wears away at this system may cause RSI.

Tendons are a common area of overuse injuries. They are tough tissues with very few nerve endings and little in the way of blood supply. Tendons are often found where there are a large number of joints to move in a relatively small space (e.g., hands or wrists), connecting the body of the muscle to the bone which it is intended to move.

Certain repetitive movements or forceful exertions can cause the tendons to rub against adjacent bones and ligaments. This can cause friction, which damages the tendons and leads to the constriction of the muscles they were designed to move.