Welcome to Essential WorkWellness' online continuing education activities. Please be aware that this activity does not include a post test or certificate of completion. Simply read the article below to expand your knowledge of computer ergonomics and work safety. Happy Learning!

Computer Ergonomics

Computer-related conditions of repetitive use injuries (RSI) frequently include carpal tunnel syndrome, back injuries, eye strain and neck and shoulder injuries. Unlike acute injuries, these conditions are often not associated with a sudden onset of symptoms because they are the result of an accumulation of years of exposure to the risk factors.

The risk factors for chronic conditions resulting in repetitive strain injuries are not always apparent. The physiologic mechanism for the development of work-related musculoskeletal disorders (WRMSD) involves static or repetitive efforts, or a combination of the two.

Static Efforts

Static efforts result when postures are held for prolonged periods of time, or from awkward postures that require ongoing muscular effort to sustain. Static (fixed) efforts cause restricted blood flow to the muscles, creating oxygen deficiency and a buildup of lactic acid. Exposure to static efforts results in:

- Acute pain

- Muscle fatigue

- Overuse syndromes

Chronic exposure to static efforts has a cumulative traumatic effect, causing wear and tear that leads to tissue degeneration from chronic inflammation. Degenerated tendon(s) develop abnormal collagen fibers (fibroblasts), making the tendons fragile and weak. Scar tissue is formed when the collagen fibers break, affecting the elasticity and normal function of the tendon.

Repetitive Efforts

Injuries associated with repetitive efforts resulting in conditions of overuse, such as a typing, mousing, and other activities that require repeated movements. At the computer, these conditions generally affect the muscles, tendons and nerves in the hands, arms and upper back.

Symptoms of repetitive use injury are varied, but can include:

- Recurrent pain in the neck, shoulders, upper back, wrists or hands

- Tingling, numbness, coldness or loss of sensation

- Loss of grip strength, lack of endurance, clumsiness or weakness

It is important to note that symptoms do not necessarily occur while the risk-producing activity is being performed. For example, night time symptoms are common.

Injury prevention and management

Preventing injury or stopping the progression of symptoms can be achieved by improving working posture and the ergonomics of the work environment. When risk factors cannot be completely eliminated, it is important to limit the time spent in risk-producing postures in order to reduce exposure.

Management and recovery from symptoms requires reducing or eliminating exposure to risk and revitalizing the integrity of the musculoskeletal system. Commitment to a program of stretching and strengthening exercises to reduce neck and shoulder muscle tension and restoration of normally functioning muscles and tendons can help heal existing disorders. However, it is suggested that you check with your healthcare provider before starting any new physical activity or exercise program.

In the meantime, you might try spending 10-20 minutes during your lunch break getting your heart rate up. It seems like a simple little thing, but it can totally transform your day. When we get our heart rate up, we increase blood flow to the muscles that have worked so hard all morning. The increased perfusion of blood removes waste products that have built up from constrained postures, and facilitates muscle recovery. If you can get outside, the fresh air will provide even more benefit. Take a brisk walk around the building a couple of times. If there's a hill nearby, take it! If it's raining or too cold, climb the stairs in the building a few times. You can even take a mini break at other times of the day when you start to feel achy and just do a few flights of stairs. It's amazing how different you feel at the end of the day when you do this.

Neutral (Natural) Posture
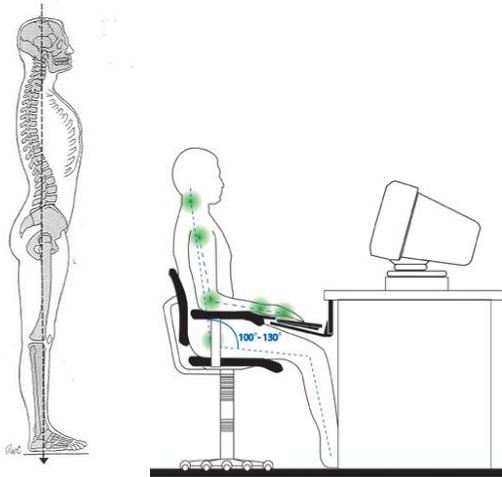
Neutral posture requires the least amount of muscular effort, protecting the muscles and tendons from overuse or repetitive strain injury.

Non-neutral or awkward postures result in:

↑muscle firing
↓endurance
↑onset of fatigue

The further from neutral posture you are, the more muscular effort is required and the quicker the onset of fatigue, increasing your risk for injury.

Balance

A neutral or natural posture means that you are balanced around your center of gravity. This posture prevents strain on your musculoskeletal system.

If you lean, twist or reach away from a balanced posture, postural imbalances occur, along with increased muscle strain and uneven loads on the bones and joints. Prolonged exposure to postural imbalances causes muscles to become overstretched, tendons to fray and bony structures to deviate in their alignment. Years of repeated awkward postures may result in the postures seeming natural and may alter the musculoskeletal framework so that achieving neutral is no longer possible.
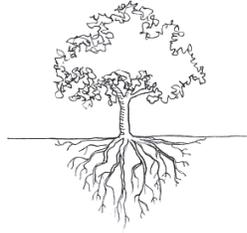
The roots of this tree balance its upper structure. Is your posture balanced?

Balanced posture:

- Reduces fatigue

- Increases endurance

- Avoids excess loading on musculoskeletal system

Applying Neutral to Your Work

Posture is determined by the need for one or more of the following:

- The need to see

- The need to reach

- The need for support

If you find yourself uncomfortable, check to see how you can solve one of those unmet needs.

Here are some basic guidelines for achieving a balanced, neutral posture at your computer workstation:

Chair Adjustment

- Adjust height so knees slightly below hips

- Adjust position so you are close to work area

- Adjust footrest or footring as necessary for support

Keyboard/Mouse Positioning

- Adjust height so forearms $\cong$ parallel to floor

- Position close to you so elbows at your side

- Position directly in front of you--avoid angling to either side

- Set to negative tilt so fingertips slightly lower than wrists

- Keep mouse close to avoid overreaching

Monitor Optimization

- Place directly in front of you

- Adjust monitor height so the top is about even with eye level

- Distance from eyes to screen--18-30" (about arms length)

Desk Adjustments

- Adjust your position to keep your work directly in front of you

- Position yourself close to desk

- If height adjustable, adjust desk so spine is upright and forearms ≅ parallel to floor

Good luck!