Ergonomics can generally be defined as the science of fitting a job to a person rather than forcing their body and mind to conform to required job tasks. Proper ergonomics has been demonstrated to help lessen muscle fatigue, increase productivity, and reduce the number and severity of work-related musculoskeletal disorders (MSDs) that affect the muscles, nerves, blood vessels, ligaments, and tendons.

In the event of a company emergency or regional, national or worldwide catastrophe, many firms have established alternative work locations or work-from-home measures in their business continuity and contingency plans. Permanent office work station ergonomics can be challenging enough, but when employees are placed in a new environment with new habits, these challenges can be compounded. An effective ergonomics program can reduce injuries and health disorders, while improving the quality of work. This article examines risk management considerations and provides best practices for optimizing proper employee work station ergonomics.

Computer workstations have become widely used throughout society and are an invaluable tool for processing information and conducting nearly every type of business. As with all tools, they can present potential risks from their use and misuse. Studies indicate that operators can be prone to a host of ailments broadly defined as Cumulative Trauma Disorders (CTDs). Most commonly these injuries impact the hands, wrists, arms, shoulders, necks, and the lower back.

Costs and trends
The enormous cost of CTDs and MSDs to industry is reflected in the form of increased workers compensation claims and insurance premiums with more disability payments and lost productivity. The US Occupational Safety and Health Administration (OSHA) estimates that ergonomic injuries cost companies between $15 to $20 billion a year and are anticipated to grow even higher as more work is shifted to digital platforms. The Canadian Centre for Occupational Health and Safety and provincial agencies have cited MSDs as the number one type of lost-time work injury as well as noting indirect costs associated with overtime/replacement wages and training, work station/equipment modifications, administration, and reduced work quality.

To add to these concerns there is a growing trend towards moving from the traditional office to working at home. New technologies have made it possible to create an office environment virtually anywhere. According to the U.S. Census Bureau, 5.2% of employees worked from home fulltime in 2017, which represented an increase of 3.3% from 2000. This represents an increase of over
3 million work-from-home employees. And in 2018 it was found that 23.7% of the population worked at home at least part-time, with Mondays and Fridays being the most popular days to telecommute. With more employees working remotely each year there is an even greater risk of developing ergonomic injuries, especially due to the use of inadequate workstations, poor work habits, and maintaining less structured and often erratic work schedules.

Basic ergonomic principals
The basic principles of ergonomics apply to both corporate and home office workstation setups. Ergonomics is the science of designing jobs and work environments to maximize operator effectiveness while at the same time minimizing the potential for injury. The benefits of an ergonomics program include but are not limited to the following:

- Reducing injuries and illnesses
- Lowering employee turnover
- Reducing workers’ compensation claims
- Increasing employee productivity
- Reducing absenteeism
- Improving employee morale

It is important for workers to know how to adjust their office workstations to suit their individual needs and help achieve these benefits.

Working from home
Telecommuters often rely on makeshift workstations that lack adequate adjustability, proper lighting, and other factors that can lead to their discomfort and even musculoskeletal injuries over time. Learning how to adjust the workstation to fit one’s unique body type has been shown to reduce discomfort levels substantially. For younger workers the reliance on mobile devices such as cell phones, tablets, and others can be particularly strong. For this demographic there needs to be encouragement to work from ergonomically designed workstations as much as possible rather than risk injury from spending too much time hunched over their hand-held devices.

Another challenge for home-based employees is being able to maintain a regular work schedule. There can be numerous distractions throughout the day from family, pets, house chores, etc. that might pull them away from their work. This in turn can lead to having to make up the time during early morning or late evening hours, and potentially not allowing for adequate rest and recovery time. There needs to be clear boundaries set between the work and home environment such as a dedicated office space, established work schedule, and the understanding from those around them that working at home does not mean that they are off duty or otherwise available for non-business activities.

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Work station self-assessment
By performing a workstation self-assessment, employees can be proactive in ensuring that they will be able to perform their work in a safe and comfortable manner. An ergonomic assessment addresses the video display terminal, table, keyboard, mouse, chair adjustability, work environment, and proper work practices. A good place to start is by using a fully adjustable chair that provides adequate lower back support and will allow the operator to maintain a comfortable upright position. The chair height should be set such that the knees are at a right angle, with both feet firmly planted on the floor. (A foot rest can also help achieve this position if necessary). It is also beneficial to provide chairs with arm rests that offer additional support when performing other work tasks.

The computer table should be set at a height that is level with the operator’s elbows. Ideally, the forearms should be parallel to the floor. The elbows, like the knees, should be positioned at a right angle. The keyboard and mouse should be positioned to maintain a neutral wrist position, and the mouse should be located close enough to the body so that minimal reaching is required. An adjustable keyboard tray can help maintain a neutral wrist posture.

The viewing height and visibility of the screen are also important considerations. The top of the screen should be set slightly below eye level, optimally at 10 to 20 percent below the horizon. This allows the operator to view the center of the screen at a position that does not strain the neck and shoulders. Screen illumination should be set to the highest possible contrast, and the screen should be positioned for minimum glare. Using a glare screen and keeping the screen clean can dramatically enhance visibility. Focal length to the screen varies per individual but is normally recommended to be between 20 and 24 inches for minimal eyestrain.
Experts recommend following the “20-20-20 Rule”. Look away from the screen every 20 minutes and look at something 20 feet away for 20 seconds.

Ergonomic work best practices

An often ignored aspect of workstation fitness is taking adequate rest breaks throughout the day. This provides time to stretch tight muscles and re-focus the eyes on something other than the computer screen. Every hour or so, it is important to stretch arms, sides, shoulders, neck, wrists, waist, and back muscles. The National Institutes of Health provides a set of recommended stretches and other exercises that target specific muscle groups often associated with ergonomic injuries. Employees whether in the office or at home can become so involved in their work that they may need to set a formal reminder to periodically get up and stretch.

Staring at computer screens for long stretches can cause eye strain. Experts recommend following the “20-20-20 Rule”. Look away from the screen every 20 minutes and look at something 20 feet away for 20 seconds. Blink often to keep your eyes moist. People who wear corrective lenses might want to also consider ordering glasses specifically designed for computer usage.

If employees experience discomfort related to their workstation they should seek assistance as soon as possible. Early intervention can help reduce the potential for a more serious condition to develop. A workstation assessment should be conducted to identify if any changes need to be made, which often can be made easily and at little or no cost. If minor adjustments do not improve the situation, then providing alternative equipment and reducing the time spent on the computer should be considered. For more serious issues the employee should also seek medical assistance. A follow-up survey should be performed after the changes have been made to confirm that the situation has improved and no more modifications are needed.

The rewards of a successful ergonomics program are twofold: Employers that take care of the health and wellbeing of their employees will see lower absenteeism, fewer medical claims, lower recruitment costs, and less turnover. In turn employees will experience better health, increased productivity, and a more positive outlook towards the environment in which they work – in the office and at home.

References


Workstation Self-Assessment Checklist on the next page 
## Computer workstation self-assessment checklist

**Date__________________**  **Company/Plant __________________________________________**

**Dept.  _________________________**  **Job Name ______________________________________**

**Workstation name ___________________________**  **Evaluator _________________________**

“*No*” responses indicate potential problem areas that should receive further investigation.

Does the workstation ensure proper worker postures, such as:

- horizontal thighs (when seated)?  
  - Yes  
  - No  
  - N/A

- vertical lower legs?  
  - Yes  
  - No

- feet flat on floor or footrest?  
  - Yes  
  - No

- straight wrists?  
  - Yes  
  - No

Does the chair ...

- adjust easily?  
  - Yes  
  - No  
  - N/A

- have a padded seat with a rounded front?  
  - Yes  
  - No  
  - N/A

- have adjustable arm rests?  
  - Yes  
  - No  
  - N/A

- have an adjustable backrest?  
  - Yes  
  - No  
  - N/A

- provide lumbar support?  
  - Yes  
  - No  
  - N/A

- have casters?  
  - Yes  
  - No  
  - N/A

Is the height of the keyboard surface adjustable?  
  - Yes  
  - No

Is the tilt of the keyboard surface adjustable?  
  - Yes  
  - No

Is the keyboard detachable from the screen? (e.g., notebook computer)  
  - Yes  
  - No

Is an adjustable document holder used?  
  - Yes  
  - No

Is screen glare avoided?  
  - Yes  
  - No

Does the monitor have brightness and contrast controls?  
  - Yes  
  - No

Do workers judge the viewing distance between eyes and screen to be satisfactory?  
  - Yes  
  - No

Is there sufficient space for knees and feet?  
  - Yes  
  - No

Can the workstation be used for either right- or left-handed activity?  
  - Yes  
  - No

Do workers take adequate rest breaks?  
  - Yes  
  - No

Is job rotation available for workers?  
  - Yes  
  - No

Can the task(s) be done at the workers’ own pace?  
  - Yes  
  - No

Are workers trained in the following:

- proper postures?  
  - Yes  
  - No

- proper work methods?  
  - Yes  
  - No

- recognizing signs and symptoms of potential problems?  
  - Yes  
  - No

- when and how to adjust their workstations to avoid musculoskeletal discomfort?  
  - Yes  
  - No