



## ERGONOMICS FACT SHEET

### What is ergonomics?

Ergonomics is the study of how to improve the **fit** between the physical demands of the workplace and the employees who perform the work. That means considering the variability in human capabilities when selecting, designing or modifying equipment, tools, work tasks and the work environment. Employees' abilities to perform physical tasks may vary because of differences in age, physical condition, strength, gender, stature and other factors.

The word "ergonomics" was coined in 1949 by the British scientist K.F.H. Murrell who put it together from the Greek "ergon" (meaning "work") and "nomos" (meaning "law"). Ergonomics uses knowledge of anatomy, mechanics, physiology and psychology to use human energy most effectively.

### What are the benefits of using ergonomic design and principles?

Ergonomics aids in increasing productivity, efficiency and quality while reducing **work-related** musculoskeletal disorders and therefore workers compensation costs.

### What are musculoskeletal disorders (MSDs)?

MSDs include injuries to the nerves, tendons, muscles and supporting structures of the hands, wrists, elbows, shoulders, neck and lower back.

### What contributes to work-related MSDs?

Contributing factors are aspects of work tasks that can lead to fatigue, musculoskeletal disorder (MSD) symptoms and injuries, or other types of problems. These factors may be present in one or more of the tasks employees must perform to accomplish their jobs. The contributing factors you and your employees should be aware of include:

- Awkward postures
- Repetitive motions
- Forceful exertions
- Pressure points (e.g., local contact stress)
- Vibration

There are also environmental factors (such as temperature extremes) associated with the workplace that can contribute to the problem.

### What ergonomic improvements can be made?

Engineering improvements may include rearranging, modifying or redesigning workstations, packaging, parts, processes, products or materials. Also, providing or replacing tools and equipment with ones designed to achieve desirable positions or postures or eliminate physical stressors.

For example, a computer keyboard with an ergonomic design helps the user avoid carpal tunnel syndrome and/or wrist pain by placing the hands in the proper position. Additionally, providing a hoisting device to lift heavy loads may eliminate back injuries.

Administrative improvements may include:

- Alternating heavy tasks with light tasks.
- Providing variety in jobs to eliminate or reduce repetition (i.e., overuse of the same muscle groups).
- Adjusting work schedules, work pace or work practices.
- Providing recovery time (e.g., short rest breaks).
- Modifying work practices so that workers perform work within their power zone (i.e., above the knees, below the shoulders, and close to the body).
- Rotating workers through jobs that use different muscles, body parts or postures.

Administrative improvements, such as job rotation, can help reduce workers' exposures to risk factors by limiting the amount of time workers spend on "problem jobs." However, these measures may still expose workers to risk factors that can lead to injuries. For these reasons, the most effective way to eliminate "problem jobs" is to change them. This can be done by putting into place the appropriate engineering improvements and modifying work practices accordingly.

### **Where can I find additional information?**

Please review our [Ergonomics Subject Index](#) page.