Ergonomics: The Human Body and Injury Prevention

Written by Mary Rodts, DNP and Mary Claire Walsh

Ergonomics is a scientific discipline that has been around for many years. Traditionally concerned with factory workers and keeping their work environments safe and efficient, ergonomic professionals have expanded their work to include all types of workers from laborers to office workers, students to seniors.

Ergonomics is concerned with how our environment interacts with our work. It also looks for ways to adjust our environment to decrease the risks of injury and illness, enhance productivity, and improve the quality of our work life.

The Goals of Ergonomics
The profession of ergonomics has two main concentrations (which often overlap):

1. Industrial ergonomics - sometimes called occupational biomechanics - is concerned with the physical aspects of work such as force, posture, and repetitive movements.

2. Human factors ergonomics looks at the psychological aspects of work such as mental stress and decision-making.

The goals of ergonomics include the following:

- Reduce work-related injury and illness
- Help contain workers’ compensation costs for employers
- Improve productivity in the workplace
- Improve the quality of work
- Reduce absenteeism
- Help employers comply with government regulations regarding work environments

Ergonomics professionals include:

- Engineers
- Safety professionals
- Industrial hygienists
- Physical therapists
- Occupational therapists
- Nurse practitioners
- Chiropractors
- Occupational physicians

How Ergonomics Improves Work and Safety
The association between work and injury and illness is centuries old. It is even thought that Ancient Man concerned himself with developing the right tools that allowed for the most efficiency and least amount of discomfort.

Today, we continue to look for ways to improve the relationship between our "tools" and our jobs. One way to do that is to look at the risk factors in the workplace. These can be divided into 3 areas: physical characteristics, environmental characteristics, and workplace hazards.

1. Physical characteristics of work:

- Posture
- Force
- Repetition
- Duration
- Recovery time
- Velocity/acceleration
- Heavy dynamic exertion
  2. Segmental vibration Environmental characteristics of work:

- Heat
- Cold
- Lighting
- Noise
- Whole body vibration
  3. Workplace hazards:

- Physical stress
- Mental stress
- Workload
- Hours (shifts, overtime)
- Slips and falls
- Fire
- Exposure hazards (electrical, chemical, biological, radiation)

**INDUSTRIAL ENGINEERING & MANAGEMENT**

Value Engineering & Industrial Best Practice

Mechanical Vibrations

Finite Element Method

Human Resource Management

Software Engineering & Management

Organizational Behaviour

Strategic Management

Knowledge Management
Design of Experiments
Advanced Operations Research
Data Base Management System
Reliability Engineering
Artificial Intelligence & Expert Systems
Just in Time Manufacturing
Decision Support Systems
Automation In Manufacturing
Data Ware Housing and Mining