



Unit 1

An Introduction to Ergonomics

Learning Outcomes

By the end of this unit the learner will be able to:

- ✓ Define ergonomics and its related terms
- ✓ Identify where to get ergonomics information for your region
- ✓ Identify how ergonomics can be incorporated into your workplace

Unit 1

An Introduction to Ergonomics

Getting Started

What is Ergonomics?

The **International Ergonomics Association** defines ergonomics like this:

Ergonomics (or **human factors**) is the scientific discipline concerned with the understanding of the interactions among humans and other elements of a system, and the profession that applies theoretical principles, data, and methods to design in order to optimize human well-being and overall system performance.

(Source: http://www.iea.cc/01_what/What%20is%20Ergonomics.html)

Ergonomics is designed to help minimize and/or prevent **musculoskeletal disorders (MSD's)**, also known as **repetitive strain injuries (RSI's)**. These conditions involve the nerves, tendons, muscles, ligaments, and other supporting structures in our bodies. Some examples include:

- Carpal tunnel syndrome
- Tennis elbow
- Carpet layer's knee
- Pitcher's shoulder
- Humidifier's lung

These injuries develop over months or even years of the same type of work, in contrast to a sudden workplace injury (like a fall or amputation).

There are four key risk factors for these types of injuries:

- Frequent and/or heavy lifting, pushing, and/or pulling
- Extended time spent in awkward postures (such as holding a piece of ceiling drywall up for several hours of the day)
- Exposure to excessive noise and/or vibration (commonly through hand tools or machinery)
- Frequent, forceful, and/or lengthy exertion

These risks are increased when:

- Multiple factors are present
- People are exposed for lengthy periods of time (i.e. eight hours a day, or a career of a constant stressor being present)
- Temperatures are extreme

A 2009 survey by the United States Bureau of Labor Statistics showed that in 2008, of the just over one million workplace injuries reported, 317,440 of them were musculoskeletal disorders. 75% of these injuries were caused by an overexertion, 40% were caused by over-lifting, and 9% were caused by repetitive motion. (The remaining percentage was caused by miscellaneous events.)

(Source: <http://www.bls.gov/iif/oshfaq1.htm#q09>)

It is clear that companies can save money; be more productive; and create a happier, healthier workforce by making their workplace more ergonomic.

Legislation and Regulatory Bodies

Before beginning any kind of ergonomic assessment or changes in your workplace, you must be aware of the legislation and/or regulatory bodies in your areas. In the United States, for example, the Occupational Safety & Health Administration has guidelines on developing programs, as well as recommendations for specific industries. Additional guidelines are in place in 27 states.

Governing Agencies

If you are not sure where to look, we recommend consulting the safety division of your government. Here is a brief list of some governing agencies.

Area	Organization(s)	Web Site
Asia	Asia Pacific Occupational Safety and Health Organization	http://www.aposho.org
Canada	Canadian Centre for Occupational Health and Safety	http://www.ccohs.ca
European Union	European Agency for Safety and Health at Work	http://osha.europa.eu
Great Britain	Health and Safety Executive	http://www.hse.gov.uk

Mexico	Secretaría del Trabajo y Prevision Social	http://www.stps.gob.mx
United States of America	Occupational Safety and Health Administration (OSHA)	http://www.osha.gov

International Ergonomics Association and Affiliates

Another excellent resource is the International Ergonomics Association (<http://www.iea.cc>), an umbrella organization for global ergonomics and human factors groups. Their website provides a list of recognized ergonomic associations. We have reprinted it here for your convenience.

Area	Organization	Web Site
Argentina	Asociación de Ergonomía Argentina	http://www.adeargentina.org.ar
Australia	Human Factors and Ergonomics Society of Australia	http://www.ergonomics.org.au
Belgium	Belgian Ergonomics Society	http://www.besweb.be
Brazil	Associação Brasileira De Ergonomia	http://www.abergo.org.br
Canada	Association Of Canadian Ergonomists	http://www.ace-ergocanada.ca
France	French Language Ergonomic Society	http://www.ergonomie-self.org
Germany	Gesellschaft Für Arbeitswissenschaft	http://www.gfa-online.de
Greece	Hellenic Ergonomics Society	http://www.ergonomics.gr
Hong Kong	Hong Kong Ergonomics Society	http://www.ergonomics.org.hk
Hungary	Hungarian Ergonomics Society	http://www.met.ergonomia.vilaga.hu/subsites/index_eng.htm
India	Indian Society of Ergonomics	http://www.ise.org.in

Area	Organization	Web Site
Ireland	Irish Ergonomics Society	http://www.irishergonomics.com
Israel	Israeli Ergonomics and Human Factors Society	http://www.ergonomicsisrael.org/joomla
Italy	Societa Italiana Di Ergonomia	http://www.societadiergonomia.it
Japan	Japan Ergonomics Society	http://www.ergonomics.jp
Latvia	Latvian Ergonomics Society	http://www.ergonomika.lv
Mexico	Sociedad de Ergonomistas de Mexico	http://www.semac.org.mx
Netherlands	Nederlandse Vereniging Voor Ergonomie	http://www.ergonoom.nl
New Zealand	New Zealand Ergonomics Society	http://www.ergonomics.org.nz
Nordic Countries: <ul style="list-style-type: none"> • Denmark • Iceland • Finland • Norway • Sweden 	Nordic Ergonomics Society	http://www.nordicergonomics.org
Poland	Polskie Towarzystwo Ergonomiczne	http://ergonomia-polska.com
Russia	Inter-Regional Ergonomics Association	http://www.ergo-org.ru
Singapore	Ergonomics Society of Singapore	http://www.ergoss.org
South Africa	Ergonomics Society of South Africa	http://www.ergonomicssa.com
Spain	Asociación Española de Ergonomía	http://www.ergonomos.es
Switzerland	Swiss Ergonomics Association	http://www.swissergo.ch

Area	Organization	Web Site
Taiwan	Ergonomics Society of Taiwan	http://www.est.org.tw
Thailand	Ergonomics Society of Thailand	http://www.est.or.th
Tunisia	Société Tunisienne d'Ergonomie	http://www.st-ergonomie.org
Ukraine	All-Ukrainian Ergonomics Association	http://www.ergotech.org.ua
United Kingdom	Institute of Ergonomics and Human Factors	http://www.ergonomics.org.uk
United States of America	Human Factors & Ergonomics Society	http://hfes.org

The Role of Ergonomics in Your Workplace

A Plan for Everyone

The way in which ergonomics is handled in the workplace will differ depending on the industry, size of the workplace, and legislation in the region. Here are a few of the most common scenarios that we have seen.

Integration with Workplace Safety Committee

In many organizations, ergonomic projects are included in workplace safety plans. The advantage to this approach is that efforts can be synchronized and re-work can be prevented. However, the downside is that ergonomics can be overshadowed by more pressing concerns about workplace injuries.

To help prevent this, ergonomics should be included as a special item on all agendas and an ergonomics representative should be appointed. This approach works well for small companies.

Special Committee

In larger organizations, a special ergonomics committee may be appointed. This group works in conjunction with the safety committee, company executives, department managers, and employees to identify and assess ergonomic hazards. They also help to develop and implement plans to reduce those hazards.

This approach works best for with large organizations that have a high ergonomic risk, such as moving companies, warehouses, and production facilities.

Ergonomics Coordinator

Another approach is to have a qualified ergonomist act as consultant and coordinator. They work with individual teams and departments to identify, assess, and resolve ergonomics hazards. In order for this to work, the coordinator must have the funds, ability, and authority to implement changes. This is an excellent approach for small organizations that have a high ergonomic risk.

Case Studies

Sunshine Cleaners

Description

A centralized company that offers residential and small business cleaning within four metropolitan areas.

Company Size

- One general manager
- Four office managers
- Eight dispatchers, two for each office
- 36 cleaners

Employee Tasks

- Office managers split time between office and field
- Dedicated safety manager who works under the general manager
- Dispatchers spend 12 hour shift at call station
- Cleaners perform wide range of tasks; some involve lifting and reaching

Recommended Ergonomic Plan

Super Service Customer Care Group

Description

A large call center that provides outsourced customer care services to nine major retailers.

Company Size

- One CEO, one CFO, and one COO
- Ten operations managers
- 50 team leaders
- 500 full-time and 100 part-time customer care representatives

Employee Tasks

- All work involves sitting for eight to ten hours
- Customer care representatives sit in a 6 foot by 6 foot cubicle and use a computer and headset
- COO leads a safety committee with two operations managers, five team leads, and five employees

Recommended Ergonomic Plan

Smith Moving

Description

A large moving company that focuses on large businesses.

Company Size

- One CEO/CFO
- 5 fleet leaders
- 50 drivers
- 250 movers

Employee Tasks

- Fleet leaders and CEO/CFO spend a lot of time in the office (on computer and telephone)
- Movers sometimes pack items beforehand
- Moving, carrying, and lifting comprise most of the movers' workday
- Drivers and movers can spend a lot of time in vehicles
- Outsourced safety coordinator currently works with fleet leaders to plan for safety measures

Recommended Ergonomic Plan

Armadillo Security

Description

A small company that provides security for a local shopping mall, including visible patrols and secret shoppers.

Company Size

- One general manager
- Six security people

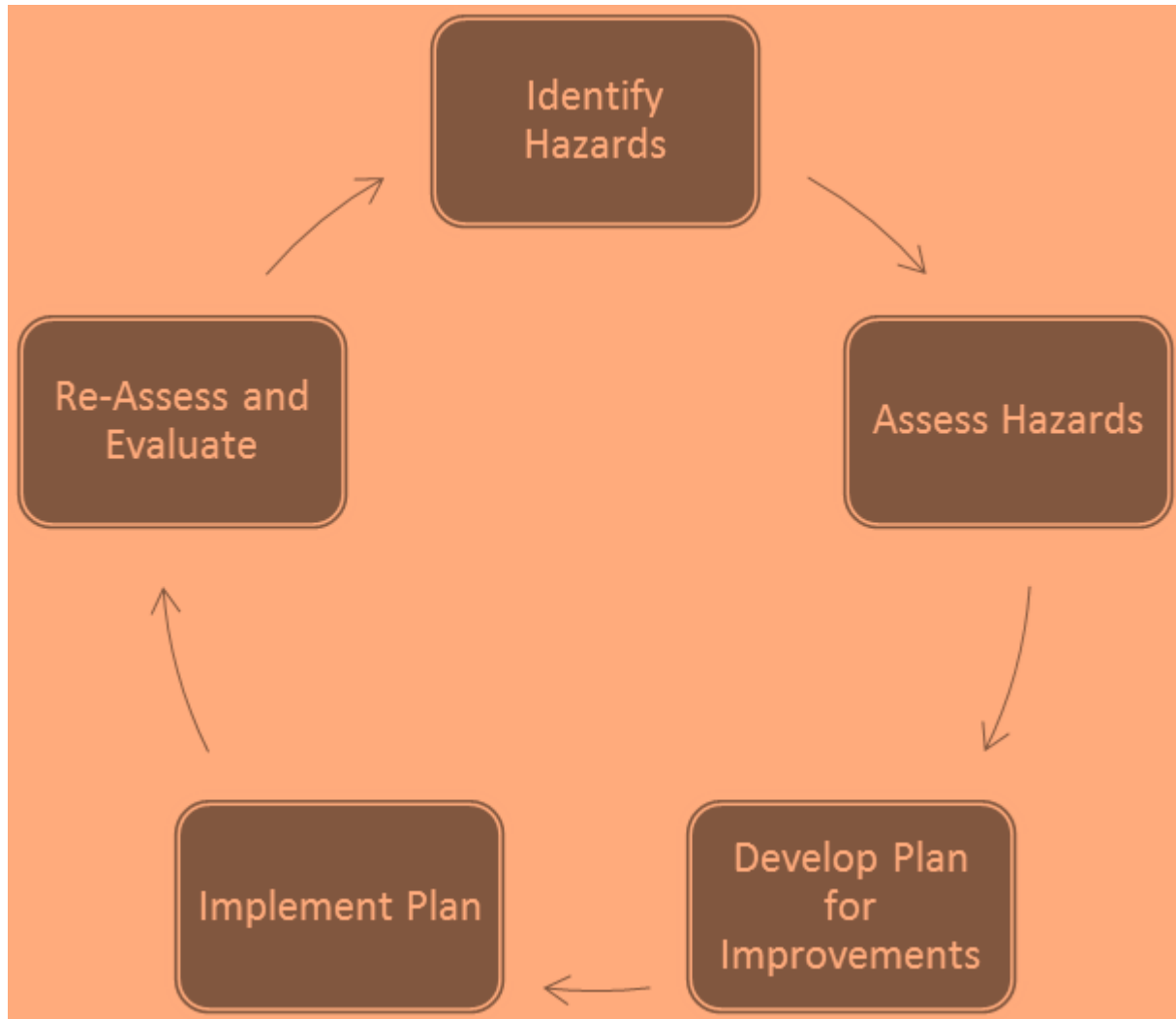
Employee Tasks

- Security people spend 10 to 12 hours a day on their feet
- General manager spends eight hours per day performing general office tasks
- No safety plan in place

Recommended Ergonomic Plan

The Ergonomic Assessment Cycle

Like any effort, ergonomic improvement should be structured and scheduled. The typical cycle looks like this:



It is important that re-assessment and evaluation is done periodically, typically once a year. This will enable the company to stay on top of any new trends and nip problems in the bud.

Let's start by looking at how to identify and assess ergonomic hazards.