<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Facilitator’s Guidelines</td>
</tr>
<tr>
<td>1-a</td>
<td>Overview</td>
</tr>
<tr>
<td>1-b</td>
<td>Getting Started</td>
</tr>
<tr>
<td>1-c</td>
<td>Presentation Guidelines</td>
</tr>
<tr>
<td>1-d</td>
<td>Lesson Plan</td>
</tr>
<tr>
<td>1-e</td>
<td>Frequently Asked Questions</td>
</tr>
<tr>
<td>2</td>
<td>Why these Guidelines are Vital to Your Safety</td>
</tr>
<tr>
<td>4</td>
<td>Musculoskeletal Disorders</td>
</tr>
<tr>
<td>8</td>
<td>Carpal Tunnel Syndrome</td>
</tr>
<tr>
<td>9</td>
<td>Proper Posture</td>
</tr>
<tr>
<td>11</td>
<td>Organizing Your Workstation</td>
</tr>
<tr>
<td>14</td>
<td>Exercises to Relieve Stress</td>
</tr>
<tr>
<td>15</td>
<td>Best Safety Practices</td>
</tr>
<tr>
<td>16</td>
<td>Office Ergonomics Today Quiz</td>
</tr>
</tbody>
</table>
Overview

Although an office environment may appear to be a relatively harmless work site, there are risks associated with the working conditions that may be present. Ergonomics is the study of the relationship between people, their tasks, their equipment and their work environment. The objective is to fit the job and tools to the worker, not the worker to the job and tools. When the physical requirements of the job exceed the capacities of the individual, Musculoskeletal Disorders can occur. Millions of workers suffer from disorders caused by seemingly harmless risk factors found in the office environment. An ergonomically correct workstation, using proper posture, and following best safety practices contributes to a safe and healthy office environment.

Program Objective

This guide explains ergonomic risk factors and identifies the potential hazards associated with developing Musculoskeletal Disorders. In it you will find:

- The definition of Musculoskeletal Disorders, or MSDs.
- Five risk factors associated with MSDs.
- How to ergonomically organize a workstation.
- Proper posture for standing and sitting at work.
- Exercises to relieve stress.
Getting Started

Training Materials

Collect all of the necessary materials and supplies before training begins. Here are some suggested materials and supplies.

- A training location that is free of distractions, has good lighting and a comfortable temperature.
- Desks and chairs arranged so that everyone will be able to see the viewing screen, the facilitator and each other.
- The video, a VCR and a TV with a remote. Make sure the video is rewound.
- An employee handbook and pen/pencil for each trainee. Each handbook includes a quiz at the back, which can be used to test comprehension and document training.
- Other supplies and equipment you may need - blackboard, chalk, paper, handouts, transparencies, overhead projector, markers, notepads, etc.
- Additional information, such as a copy of the regulation or other reference tools.

Preparation

A successful presentation requires preparation and planning. Give yourself several days before the training session to get organized.

- Locate and schedule the training site as soon as possible.
- Notify trainees of the training date and time, the training schedule and proper dress.
- Obtain all necessary equipment and supplies.
- Make sure you know how to operate the TV, VCR and other equipment. Check to ensure that it is working properly. Replace or repair any damaged equipment.
- Prepare your presentation, including a lesson plan or outline of the training. Include the training goals and objectives. Some presentation guidelines are included on the next page. A sample lesson plan has been included on page 1-d of this Facilitator’s Guide.
- A day or so before conducting the training session, you may want to have participants take the quiz as a pre-test. The results of this test can help you to determine weak areas to focus on during the training session.
- Preview the videotape. Note any key points you want to expand upon in your training.
## Presentation Guidelines

How you present the training course can have a great impact on learning. By following these simple presentation guidelines and keeping your objectives in mind, you can effectively and efficiently get the most out of your training session.

<table>
<thead>
<tr>
<th>Section</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organize Training Time Efficiently</strong></td>
<td>In today’s busy work climate, it can be difficult to find the time needed for training. So, it is important to be organized and well-prepared when you do schedule training sessions. Whether you use Summit’s suggested Lesson Plan or not, it is important to have a lesson plan prepared that you can implement comfortably. This ensures that time spent in training is productive and beneficial for everyone.</td>
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<td><strong>Stress the Purpose and Goals of Training</strong></td>
<td>Training needs to be goal-oriented. State the purpose of training in a clear, specific manner - whether it’s to reduce injuries, increase production, improve quality, improve working conditions, etc. Review the goals and objectives of the training so trainees know what is expected of them.</td>
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<td><strong>Capture Their Attention</strong></td>
<td>Training needs to be interesting and compelling to hold trainees’ attention. To help motivate learners, give them specific evidence that their effort makes a difference and provide feedback on their progress. Also, remember that the first experience with a new subject usually forms a lasting impression on the learner. By making that experience a positive one, you can help ensure your audience retains the information learned.</td>
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<tr>
<td><strong>Make New Learning Experiences Pleasant</strong></td>
<td>For some adults, past experiences with education were unpleasant and not helpful. Adults learn best when they feel comfortable. By making the learning environment open and friendly, you can help adults to feel secure in their new learning experience. Offer support and feedback as often as possible, and be ready to provide extra attention to those who may require it.</td>
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<td><strong>Ask If There are any Questions</strong></td>
<td>When most adults learn new information that conflicts with what they already know, they are less likely to integrate those new ideas. It is very important to make sure participants fully understand the training and do not have any unresolved questions. Provide for a question and answer period so participants can resolve those questions and/or answer questions throughout the training session.</td>
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</tbody>
</table>
As a qualified trainer, your job is to effectively communicate a great deal of information in a well-organized manner. By preparing a lesson plan, you can ensure that each minute of the training session is productive. Summit has provided a suggested lesson plan for your use.

1. Introduce the Topic and Purpose of Training
   Research proves that audience retention is higher when programs are given a brief introduction before viewing them. Prepare an introduction that explains the reasons for training and what will be taught.

2. Show the Video:
   "Office Ergonomics Today"

3. Discussion and Demonstration
   To help relate the training to your site, you may wish to incorporate your own discussion topics and exercises. Key issues you might consider include:
   - The science of ergonomics and how it relates to employees in your office environment.
   - Musculoskeletal Disorders, what causes them and possible risk factors in your office environment.
   - Carpal Tunnel Syndrome.
   - The benefits of ergonomically organizing workstations.

4. Use Handbooks to Reinforce Training
   The handbooks increase comprehension and reinforce the information learned in the video program by explaining the main points and expanding on the original material. For increased employee information retention, go over one section at a time and stop to answer questions. The quiz at the back of the Facilitator’s Guide is provided to document employee training. Answers to the quiz are in bold type.

5. Questions and Answers
   Provide for a Q&A session to answer any questions. It may be necessary to review some of the material when providing answers. The employee handbook, equipment manuals and other reference tools may be helpful.
Ergonomics is the study of the relationship between people, their tasks, their tools and their work environment. Employers study ergonomics to fit the job and the tools to the worker. When workers adjust themselves beyond their physical capacity to the requirements of the job, they run the risk of developing a Musculoskeletal Disorder. Ergonomically organizing your workstation can help you avoid risk factors leading to MSDs.

Analyze the physical requirements of your job and look for risk factors associated with MSDs. Don’t wait until you develop symptoms of an MSD. Consider the risk factors that may be present in your job function. Are you working with excessive repetition, static or awkward posture, compression or force to complete the required tasks? Check your posture when sitting and standing, as well as how your workstation is organized. Get into the habit of stress relieving exercise and employer directed “micro-breaks.” Most importantly, notify your supervisor if you have any concerns about developing an MSD.

Why should I be concerned about developing a Musculoskeletal Disorder, or MSD?

In the office environment, hazards for permanent injury are not as obvious as those in the manufacturing or production environments. People who work in an office environment need to be aware of risk factors that cause MSDs, and specifically, MSDs like Carpal Tunnel Syndrome. Tasks performed in an office environment may not appear to be very physically demanding. However, when performed repeatedly and when combined with other stress factors, simple tasks can lead to permanent injury. That’s why it is important for employees to recognize the risks associated with repeated exposure to work-related risk factors in the office.

How can the science of ergonomics help me to work safely?

Ergonomics is the study of the relationship between people, their tasks, their tools and their work environment. Employers study ergonomics to fit the job and the tools to the worker. When workers adjust themselves beyond their physical capacity to the requirements of the job, they run the risk of developing a Musculoskeletal Disorder. Ergonomically organizing your workstation can help you avoid risk factors leading to MSDs.

How will I know if I’m at risk for developing an MSD?

Analyze the physical requirements of your job and look for risk factors associated with MSDs. Don’t wait until you develop symptoms of an MSD. Consider the risk factors that may be present in your job function. Are you working with excessive repetition, static or awkward posture, compression or force to complete the required tasks? Check your posture when sitting and standing, as well as how your workstation is organized. Get into the habit of stress relieving exercise and employer directed “micro-breaks.” Most importantly, notify your supervisor if you have any concerns about developing an MSD.
Why These Guidelines are Vital to Your Safety

In the office environment, risk factors for injuries are not as obvious as those in manufacturing or production environments. Yet, each year thousands of workers suffer from injuries in the office environment. Nationally, these disorders account for:

- 34% of all lost workday injuries and illnesses
- $15 Billion in worker compensation costs annually

Ergonomics is the study of the relationship between people, their tasks, their equipment and their work environment. The objective is to fit the job and the tools to the worker, not the worker to the job and tools. When there is a mismatch between the physical requirements of the job and the physical capacities of the individual, musculoskeletal disorders, or MSDs, can occur. That’s why it is important to understand the risks associated with repeated exposure to work-related stress factors in the office.
You will learn:

- What ergonomics is and how it can help you avoid injury.
- Musculoskeletal disorders and how to avoid them.
- Benefits of good posture and proper work station adjustments.
- Best safety practices for a healthy office environment.

To help you avoid Musculoskeletal Disorders:

- Review each page in this handbook.
- Take the quiz at the end of the handbook to review your knowledge.
- If you have any questions, ask your supervisor.
Musculoskeletal Disorders

Musculoskeletal Disorders, or MSDs, are the result of repeated exposure to risk factors. Exposure can occur over months and even years before symptoms appear. Musculoskeletal Disorders are also referred to as Repetitive Motion Injuries, Cumulative Trauma Disorders or Repetitive Stress and Strain Injuries. They are injuries to the:

- muscles
- tendons
- ligaments
- joints
- nerves
- cartilage
- spinal disks

The highest frequency of injuries occurs in the upper extremities and lower back.

Five Risk Factors

There are five risk factors that can contribute to MSDs. They include:

**Static Posture** occurs when the same body posture is held for long periods of time. The exertion places increased force on the muscles and tendons, contributing to fatigue. The lack of movement reduces blood flow and decreases nutrients to the affected body parts.

Examples of static posture found in the office include:

- grasping a mouse for long periods
- sitting in the same position without movement
- holding the telephone to your ear
Awkward posture occurs when the body is placed out of its natural "at rest" position. When awkward postures are held for long periods of time, they can compress or extend muscles, tendons and nerves beyond their capacity.

Examples of awkward posture found in the office environment include:
- lifting while twisting the torso
- bending at the waist
- reaching overhead or working above shoulder level
- bending the wrist from side to side while moving the mouse

Repetition occurs when the same task or series of motions are performed over and over again with little variation. When these motions are repeated frequently for long periods without adequate rest, muscles and tendons become fatigued and strained.

Examples of repetitive office activities include:
- keyboard and mouse use
- stapling
- sorting
- filing
- opening envelopes

Key Point

When repetition is combined with other risk factors, the potential for injury is increased.
Compression occurs when repeated or continuous contact is made between soft body tissues and a hard or sharp object. This type of contact puts pressure on muscles, nerves, tendons and other tissues causing inflammation and reduced blood flow to the affected part of the body.

Examples of activities that cause compression in the office include:

- resting the arms or wrists on the edge of a desk
- using hand tools that cause pressure
- resting an elbow on a hard surface

Force is the amount of physical effort needed to perform a task. When performing a task with high force, added pressure is placed on the muscles, tendons, ligaments and joints. This can cause strain, and lead to inflammation and injury.

Examples of excessive force in the office include:

- lifting heavy objects
- stapling
- typing
- moving objects

Risk factors are also affected by:

- duration, frequency and magnitude of exposure
- physical condition
- some prescription medications
- use of tobacco, alcohol and other drugs
Early Warning Signs

MSDs are caused by repeated exposure to risk factors over time — rather than a sudden incident. This means the early warning signs of MSDs are often very subtle and occasional. There may be no visual sign of injury. Early indicators that you might be developing an MSD include:

- decreased range of motion in the upper extremities
- decreased grip strength
- loss of function
- in severe cases, deformity

Symptoms can vary in severity depending on the amount of exposure to ergonomic risk factors. Symptoms appear gradually and usually disappear after rest. As exposure continues over time, symptoms can become more severe and may not disappear after rest. Common symptoms of MSDs include:

- numbness
- pain
- cramping

- burning
- tingling
- stiffness
Carpal Tunnel Syndrome

Carpal Tunnel Syndrome is one of the most publicized MSDs. The carpal tunnel receives its name from the eight bones in the wrist called carpals that form a tunnel-like structure. The main tendons and nerve of the hands pass through this structure, which is about the size of a dime.

Excessive repetitive motions of the hands and fingers may cause the lubricant surrounding the tendons to wear down, which can cause the tendons to become inflamed and swollen. When the tendons swell, pressure is increased on the main nerve of the hand, causing the symptoms of Carpal Tunnel Syndrome. The primary symptoms are:

- pain and numbness in the first three fingers
- pain or prickling sensation that radiates up the arm to the shoulder
- pain and numbness that is often worse at night
- swollen feeling in the fingers and wrist
- weakness while gripping

Other Common MSDs include:
- Epicondylitis
- Tarsal Tunnel Syndrome
- Sciatica
- Tendonitis
- DeQuervain’s disease
- Trigger Finger
- Herniated spinal disks
- Raynaud’s Phenomenon
- Ganglion
- Rotator cuff disease
- Carpet layer’s knee
- Low back pain
Research has proven that poor posture is a significant factor in developing a musculoskeletal disorder. When poor posture is combined with other risk factors, your chance of injury increases. While there is no one “best” posture, the goal is to keep your body in its neutral, or "at rest," position.

Follow these posture guidelines to decrease stress on the body:

- Keep the arms below shoulder level.
- Maintain the natural "S" shape of the spine.
- Place the elbows close to the body.
- Maintain the hands and wrists as a natural extension of the forearms.

Over 75% of our time at work is spent sitting. Follow these guidelines to sit properly:

- Place the feet flat on the floor or footrest.
- Keep the knees slightly lower than the hips.
- Keep the lower back fully supported by the chair to maintain the natural "S" shape of the spine.
- Hold elbows close to the body with the arms below shoulder level.
Proper Posture (continued)

• Keep the hands and wrists as natural extensions of the forearms.
• Relax neck and shoulders.
• Align the head with the spine so the ears are directly over the shoulders.

If you are required to SIT for long periods of time:

• Stand up and stretch periodically to relieve stress.
• Take "micro-breaks" by rocking back in your chair while waiting for the computer to respond or while on the telephone.

If you are required to STAND for long periods of time:

• Relieve stress by periodically shifting your weight.
• Rest one foot on a footrest or other object.

Be constantly aware of your posture, whether standing or sitting.
Organizing Your Workstation

When organizing your work environment, consider your posture, the job tasks you perform and the respective risk factors to help you make the best ergonomic decisions. The following are guidelines for proper positioning and placement of workstation items.

Your chair

*Your chair should adjust to you, not you to the chair.* Your chair serves as the foundation for all other adjustments to your workstation. While not all chairs will have the same adjustments, every chair should be comfortable, stable and provide adequate support. Know how to use the adjustments on your chair to maximize its ergonomic benefits.

Keyboard and Mouse

Placement is critical since repetitive motions are most often performed using the keyboard and mouse. To correctly position your keyboard and mouse:

- Be sure your wrists are flat, natural extensions of your forearms. *If your workstation is not adjustable, install an adjustable keyboard tray or use a footrest to maintain proper placement.*
- Place the mouse at the same level as your keyboard.
• Be aware of the amount of force you use when typing. Many people use more force than necessary when striking the keys. Use keyboard shortcuts to reduce the number of keystrokes.

• When using the mouse, grip it lightly and move your entire arm, not just your wrist. Avoid resting the palm of your hand on the desk and bending your wrist left and right.

Display Screen

Placement of the monitor is crucial if you spend much time working at a display screen. To correctly position your display screen:

• Make sure the top of the viewing screen is at, or slightly below eye level. *If your monitor doesn’t allow for height adjustment use an adjustable stand or monitor riser.*

• Keep the screen a minimum of 18-24 inches from your face or, if possible, up to 30 inches. *In general, the monitor should be an arms length away from your face, but close enough to see the screen clearly when sitting back in your chair.*
• Position the display screen at a right angle to windows to avoid screen glare.

• Adjust the contrast and brightness to a comfortable level.

• Clean the screen on a regular basis.

Light your Workstation

Good lighting reduces eye stress and fatigue. Keep lighting bright enough to see text and screen, but not too bright to cause glare or discomfort. Direct task-lighting on the document — not the computer screen. Lighting that is good for computing tasks may not be adequate for other tasks, such as reading.

Other factors to consider when organizing your work area include the tasks you perform and how frequently you perform them.

• Place frequently used items within easy reach.

• Eliminate the need to continuously raise your arms above shoulder level.

• Vary your job tasks to avoid excessive repetition and static posture.

• If you routinely perform tasks that require excessive force, look for alternate means or mechanical assistance.

• Allow time for your body to rest between exertions.
A few simple exercises at your workstation can relieve ergonomic stress factors and prevent injury later. When stretching, breathe easily, don’t bounce and don’t stretch to the point of pain.

**To relieve stress on your eyes:**
- Periodically pick out a distant object and briefly focus on it.
- Block out the light by cupping your hands over your closed eyes and hold for one minute.
- Remember to blink frequently.

**To relieve stress in the neck and shoulders:**
- Slowly rotate your head clockwise and then counterclockwise.
- Roll the shoulders forward and back.
- Tilt the head from side to side.

**To relieve stress on the body:**
- Stand up and stretch overhead.
- Bend from side to side.
- Rotate your ankles.
- Vary your seated posture by leaning back in your chair or stretching out your legs.

**To relieve stress in the hands and wrists:**
- Rotate your wrists.
- Slowly stretch and extend your fingers, then close them into your palm three to five times.

Static posture and lack of movement promotes fatigue and causes additional stress on the body. Taking a minute to perform stress-relieving exercises can have a dramatic impact on reducing the risk of developing an MSD.

The better your physical condition, the better your body is able to handle the risk factors present in an office environment. As little as 20 minutes of moderate exercise three times a week can make a big difference in your overall health. Always consult your doctor before beginning an exercise program.
Musculoskeletal disorders can affect anyone exposed to the risk factors. Analyze the functions you perform and look for ways to eliminate ergonomic risk factors.

- Be aware of your posture at all times.
- Recognize and report symptoms of MSDs early; prevention is the best treatment.
- Adjust your chair properly, and always keep your spine fully supported by the chair back when seated.
- Make sure your monitor is at the correct height and position.
- Position your keyboard and mouse properly.
- For computing tasks, direct light on the document — not the monitor.
- Use light keystrokes.
- Take frequent exercise and stretching "micro-breaks."
- Shift your weight while standing, or use a footrest.
- Maintain a healthy lifestyle.
# Office Ergonomics Today Quiz

To review your knowledge of Office Ergonomics Today, answer the questions below.

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1. Ergonomics is the science of adjusting the worker to fit the job.
   a. True
   b. False

2. Musculoskeletal disorders, or MSDs, are caused by:
   a. a sudden incident.
   b. an allergic reaction.
   c. a chronic illness.
   d. repeated trauma.

3. Most MSDs occur in the upper extremities and...
   a. legs.
   b. lower back.
   c. fingers.
   d. upper arms.

4. Frequently used items should be placed:
   a. within easy reach.
   b. above shoulder level.
   c. in a drawer.
   d. none of the above.

5. Signs and symptoms of musculoskeletal disorders can include:
   a. decreased range of motion.
   b. decreased grip strength.
   c. loss of function.
   d. deformity in severe cases.
   e. all of the above.
Office Ergonomics Today Quiz

6. Carpal Tunnel Syndrome is caused by: (Select all that apply.)
   a. friction and swelling of the tendons.
   b. gradual shrinkage of the carpal tunnel.
   c. pressure placed on the median nerve.
   d. over-extension of the wrist muscles.

7. When standing for long periods of time, you should always keep both feet on the floor.
   a. True
   b. False

8. Select an example of proper posture. (Select all that apply.)
   a. head aligned over the spine so ears are directly over shoulders.
   b. elbows away from the body.
   c. spine in its natural "S" shaped position.
   d. feet flat on the floor or footrest.
   e. arms above shoulder level.

9. The mouse should be placed so that it is at a higher level than the keyboard.
   a. True
   b. False

10. When stretching, you should:
    a. stretch through the pain.
    b. hold your breath.
    c. bounce to increase its effectiveness.
    d. none of the above.