

TRAINING ELEMENTS

1. Determine if training is needed. If the evidence gathered indicates a need to control ergonomic risk factors, then employees should be provided with the training.

2. Identify training needs. Different categories of employees will require different kinds of ergonomics instruction.

3. Identify goals and objectives. The objectives of training must be defined in clear, directly observable, action-oriented terms.

4. Develop learning activities. Whatever the mode of training, learning activities should be developed that will help employees demonstrate that they have acquired the desired knowledge or skill.

5. Conduct training. Training should take into account the language and educational level of the employees involved. Trainees should be encouraged to ask questions that address their particular job concerns, and hands-on learning opportunities should be encouraged.

6. Evaluate training effectiveness. A common tool is the use of questions about whether they found the instruction interesting and useful to their jobs. More important, however, are measures of the knowledge gained or improvements in skills, as may be specified in the course objectives. One exercise recommended here is for the class to propose improvements in workplace conditions on the basis of information learned in class for presentation to management for their review.

7. Improving the program. If the evaluations indicate that the objectives of the training were not achieved, a review of the elements of the training plan would be in order and revisions should be made to correct shortcomings.

Risk Services Notes

ERGONOMICS

Ergonomics is the science of fitting workplace conditions and job demands to the capabilities of the working population. Effective and successful "fits" assure high productivity, avoidance of illness and injury risks, and increased satisfaction among the workforce. Although the scope of ergonomics is much broader, the term refers to assessing those work-related factors that may pose a risk of musculoskeletal disorders and recommendations to alleviate them.

Although definitions vary, the general term "musculoskeletal disorders" describes the following:

- Disorders of the muscles, nerves, tendons, ligaments, joints, cartilage, or spinal discs
- Disorders that are not typically the result of any instantaneous or acute event (such as a slip, trip, or fall) but reflect a more gradual or chronic development (nevertheless, acute events such as slips and trips are very common causes of musculoskeletal problems such as low back pain)
- Disorders diagnosed by a medical history, physical examination, or other medical tests that can range in severity from mild and intermittent to debilitating and chronic
- Disorders with several distinct features (such as carpal tunnel syndrome) as well as disorders defined primarily by the location of the pain (i.e., low back pain)

What are clues or tip-offs to WMSDs (Work-Related Musculoskeletal Disorders) as a real or possible workplace problem? Some signs are obvious while others are more subtle. The first step is to look for these signs or clues. *We have created a report in STARS, titled "Ergonomic Analysis". This is located under Reports in STARS in the RSK SRVCS folder. We would suggest that you copy this report and analyze the data obtained.*

Sometimes these records contain nonspecific entries like "hand pain," which (while not a specific diagnosis) may be an indicator of a significant health problem if severe or persistent.

For ergonomics, the overall goal of training is to enable managers, supervisors, and employees to identify aspects of job tasks that may increase a worker's risk of developing WMSDs, recognize the signs and symptoms of the disorders, and participate in the development of strategies to control or prevent them. Training employees ensures that they are well informed about the hazards so they can actively participate in identifying and controlling exposures.

Materials for offering awareness training to the workforce are available, including videotapes and pamphlets from NIOSH and other groups. Employers may prefer to generate their own informational materials tailored to their particular job operations. Persons or groups assigned to or expected to play a key role in ergonomic hazard control work will require added instruction in problem identification, job analyses, and problem-solving techniques. This training is available through short courses publicized in many occupational safety and health publications or through a consultant. Training objectives are not intended to have workers, supervisors, or managers diagnose or treat WMSDs. Rather, the purpose is to instill an understanding of what type of health problems may be work related and when to refer employees for medical evaluation. The training should include what is known about work and non work causes of musculoskeletal disorders and the current limitations of scientific knowledge.

Training should be understandable to the target audience. Training materials used should consider the participants educational levels, literacy abilities, and language skills. This may mean, for example, providing materials, instruction, or assistance in Spanish rather than English.

For this and more valuable information on Ergonomic Training, please visit the Center for Disease Control at:

<http://www.cdc.gov/niosh/>

GENERAL ERGONOMIC RISK ANALYSIS CHECKLIST

Shade in the dot if your answer is "yes" to the question. A "yes" response indicates that an ergonomic risk factor may be present which requires further analysis.

Manual Material Handling

- Is there lifting of loads, tools, or parts?
- Is there lowering of tools, loads, or parts?
- Is there overhead reaching for tools, loads, or parts?
- Is there bending at the waist to handle tools, loads, or parts?
- Is there twisting at the waist to handle tools, loads, or parts?

Physical Energy Demands

- Do tools and parts weigh more than 10 pounds?
- Is reaching greater than 20 inches?
- Is bending, stooping, or squatting a primary task activity?
- Is lifting or lowering loads a primary task activity?
- Is walking or carrying loads a primary task activity?
- Is stair or ladder climbing with loads a primary task activity?
- Is pushing or pulling loads a primary task activity?
- Is reaching overhead a primary task activity?
- Do any of the above tasks require five or more complete work cycles to be done within a minute?
- Do workers complain that rest breaks and fatigue allowances are insufficient?

Other Musculoskeletal Demands

- Do manual jobs require frequent, repetitive motions?
- Do work postures require frequent bending of the neck, shoulder, elbow, wrist, or finger joints?
- For seated work, do reaches for tools and materials exceed 15 inches from the worker's position?
- Is the worker unable to change his or her position often?
- Does the work involve forceful, quick, or sudden motions?
- Does the work involve shock or rapid buildup of forces?
- Is finger-pinch gripping used?
- Do job postures involve sustained muscle contraction of any limb?

GENERAL ERGONOMIC RISK ANALYSIS CHECKLIST (continued)

Shade in the dot if your answer is "yes" to the question. A "yes" response indicates that an ergonomic risk factor may be present which requires further analysis.

Computer Workstation

- Do operators use computer workstations for more than 4 hours a day?
- Are there complaints of discomfort from those working at these stations?
- Is the chair or desk nonadjustable?
- Is the display monitor, keyboard, or document holder nonadjustable?
- Does lighting cause glare or make the monitor screen hard to read?
- Is the room temperature too hot or too cold?
- Is there irritating vibration or noise?

Environment

- Is the temperature too hot or too cold?
- Are the worker's hands exposed to temperatures less than 70 degrees Fahrenheit?
- Is the workplace poorly lit?
- Is there glare?
- Is there excessive noise that is annoying, distracting, or producing hearing loss?
- Is there upper extremity or whole body vibration?
- Is air circulation too high or too low?

General Workplace

- Are walkways uneven, slippery, or obstructed?
- Is housekeeping poor?
- Is there inadequate clearance or accessibility for performing tasks?
- Are stairs cluttered or lacking railings?
- Is proper footwear worn?

GENERAL ERGONOMIC RISK ANALYSIS CHECKLIST (continued)

Shade in the dot if your answer is "yes" to the question. A "yes" response indicates that an ergonomic risk factor may be present which requires further analysis.

Tools

- Is the handle too small or too large?
- Does the handle shape cause the operator to bend the wrist in order to use the tool?
- Is the tool hard to access?
- Does the tool weigh more than 9 lb?
- Does the tool vibrate excessively?
- Does the tool cause excessive kickback to the operator?
- Does the tool become too hot or too cold?

Gloves

- Do the gloves require the worker to use more force when performing job tasks?
- Do the gloves provide inadequate protection?
- Do the gloves present a hazard of catch points on the tool or in the workplace?

Administration

- Is there little worker control over the work process?
- Is the task highly repetitive and monotonous?
- Does the job involve critical tasks with high accountability and little or no tolerance for error?
- Are work hours and breaks poorly organized?

LINKS TO OTHER ERGONOMIC CHECKLISTS AT NIOSH

RISK FACTOR CHECKLIST

Ergonomic Hazard Identification Checklist

<http://www.cdc.gov/niosh/docs/97-117/eptbtr5b.html>

Workstation Checklist

<http://www.cdc.gov/niosh/docs/97-117/eptbtr5c.html>

Task Analysis Checklist

<http://www.cdc.gov/niosh/docs/97-117/eptbtr5d.html>

Handtool Analysis Checklist

<http://www.cdc.gov/niosh/docs/97-117/eptbtr5e.html>

Materials Handling Checklist

<http://www.cdc.gov/niosh/docs/97-117/eptbtr5f.html>

Computer Workstation Checklist

<http://www.cdc.gov/niosh/docs/97-117/eptbtr5g.html>

DESIGN PRINCIPLES CHECKLIST

General Workstation Design Principles

<http://www.cdc.gov/niosh/docs/97-117/eptbtr9.html#first>

Design Principles for Repetitive Hand and Wrist Task

<http://www.cdc.gov/niosh/docs/97-117/eptbtr9.html#second>

Handtool Use and Selection Principles

<http://www.cdc.gov/niosh/docs/97-117/eptbtr9.html#third>

Design Principles for Lifting and Lowering Task

<http://www.cdc.gov/niosh/docs/97-117/eptbtr9.html#fourth>

Design Principles for Pushing and Pulling Task

<http://www.cdc.gov/niosh/docs/97-117/eptbtr9.html#fifth>

Design Principles for Carrying Task

<http://www.cdc.gov/niosh/docs/97-117/eptbtr9.html#sixth>