Chapter 5.5 Ergonomics

This could be you . . .

A supervisor began having pain in his wrist when using his computer. He took the Computer Ergonomics class, followed the suggestions made in the class, and has been pain-free ever since.

An employee began having neck pain after moving into a smaller office. An ergonomic assessment showed her neck pain was due to twisting, which was caused by her computer monitor not being in line up with the keyboard and her body.

5.5.1 Applicability of this chapter

You are required to follow this chapter if you work at JSC or a JSC field site.

5.5.2 What this chapter covers

This chapter covers JSC's ergonomics program, which shall follow paragraph 4.9 of NPR 1800.1. Although there is no OSHA ergonomics-specific standard, employers are required to provide information, instruction and supervision to workers and to take every precaution reasonable within the circumstances for the protection of workers. JSC is committed to eliminating injuries and illnesses caused by improper ergonomics.

5.5.3 Why ergonomics is important

Ergonomics is the science of fitting jobs to people. Ergonomic design is applying this body of knowledge about physical abilities, limitations, and other human characteristics to the design of the workplace (i.e., work tasks, equipment, environment) for safe and efficient use by workers. It is principally based on preventing musculoskeletal disorders (MSDs), such as carpal tunnel syndrome, back injuries, and other work-related disorders caused by improper job, tool, and workstation design. MSDs account for nearly a third of the occupational illnesses and require one-and-a-half as many days away from work as the median for all injuries, as reported in the annual Bureau of Labor Statistics survey.

5.5.4 Risk Factors for MSDs

5.5.4.1 Musculoskeletal disorders (MSDs) are injuries and disorders to soft body tissues including muscles, nerves, tendons, ligaments, joints, cartilage, and spinal discs. Work-related MSDs can be caused or aggravated by various hazards in the workplace or in the job design. NOTE: MSDs do not include disorders caused by slips, trips, falls, motor vehicle accidents, or similar accidents. Key risk factors for developing an MSD are:

a. Force – Force is the amount of effort made by the muscles and amount of pressure on body parts as a result of job demands. All tasks require the exertion of some level of force. It becomes a risk when the force required is too high, done too frequently, or held for too long for the particular body part required.

b. Fixed or awkward postures – Posture is the position of the various parts of the body. A goal in ergonomics is “neutral” posture, operating the joints near the middle of their full range of motion. Using the joint near the end of its range increases the risk of injury, as will holding it fixed in a single posture too long.

c. Repetition – Making the same movement or using the same parts of the body repeatedly with few or no breaks increases the risk of developing an MSD. This is true even if the force required is low and the posture is not awkward.

d. Duration – Performing a single task one time may not create a risk, but holding a single posture too long or performing that task repeatedly without sufficient rest increases the risk of injury.

e. Other Factors – Other risk factors that can increase the risk of an MSD include hand-arm vibration, whole-body vibration, contact stress, cold temperatures, and hot work environments.

5.5.5 Recognizing ergonomic hazards

5.5.5.1 Review your job and your workspace for each of these risk factors as part of your job or task hazard analysis, remembering to:

a. Include not only jobs requiring manual lifting but also office jobs involving static postures and laboratory jobs involving fine manipulation.

b. Include analysis of the combination of risk factors, as the presence of a single factor may not create an MSD risk but the combination of multiple factors will.

c. Contact your company’s health and safety professional or your area ergonomics team for help. You can also contact Occupational Health at x36726 for an evaluation.

d. Use the checklists provided at https://sashare.sp.jsc.nasa.gov/sd/SD3/SitePages/Ergonomics.aspx.

5.5.6 Implementing corrections and controls

5.5.6.1 The ideal correction is to fit the job to the person, not to make the person fit the job. Based on the hazard analysis and ergonomic evaluation, make the necessary changes to workstations and job procedures to prevent injury, including:

a. Get furniture that fits your body size and space constraints. NOTE: An ergonomic evaluation is required before a request for alternative furniture (including chairs) will be processed by the JSC Furniture Office.

b. Repair or replace any broken office furniture. Some organizations have made special purchases of office furniture for their own use, and the purchase may include maintenance. Check with your supervisor to see if your broken furniture is covered by such a maintenance plan. If not, then email jsc-logistics-wcc@nasa.gov for repair or replacement of any broken office furniture.

c. Have your eyes checked if you are having eyestrain. Be sure to tell your optometrist if you work with a computer.

d. Adjust the lighting and noise levels to comfortable levels.

e. Adjust the temperature to a comfortable level within indoor air quality requirements (Chapter 5.4) and JSC Energy Conservation guidelines.

f. Avoid awkward positions, repetitive motions, and excessive force in your job.

g. Select tools and handles that are comfortable and reduce strain and vibration in your hands and arms.

h. Make sure the tools you use (including your keyboard and mouse) are in good working order and have been properly maintained.

i. Analyze the tasks you do. Try to find an easier or more comfortable way to get the job done.

j. For non-computer workstations, such as soldering benches, microscopes, etc., contact Occupational Health for an individual assessment.

5.5.6.2 Administrative controls reduce exposure to ergonomic hazards. A person who has had an MSD will likely need more attention. As an employee or manager, you can:

a. Reduce the number of repeated motions for each employee and limit overtime work.

b. Allow yourself or your workers time to get used to a job.

c. Take short rest breaks (1 to 3 minutes per hour), changing your posture and activity to relieve stiff muscles and tendons.

d. Increase the number of employees assigned to a task to lighten the load on everyone (especially in lifting heavy objects).

e. Rotate jobs to reduce fatigue and stress on a particular muscle group.

f. Provide standby or relief personnel to compensate for busy times on the job.

g. Reduce repeated motions by combining quick jobs.

h. Develop realistic goals and timelines. Try not to wait until the last minute to schedule a job.

i. Exercise to improve physical fitness.

j. Buy ergonomic or automated equipment, whenever possible.

5.5.7 Who is involved in JSC's ergonomics program

a. Employees shall:

(1) Learn the signs and symptoms of potential MSDs for their jobs and report any to their supervisor.

(2) Practice good posture and work habits to reduce ergonomic injury.

(3) Bring ergonomic concerns to their supervisor.

(4) Learn to identify and analyze their job for ergonomic hazards, and make recommendations to correct them.

(5) Use proper ergonomic practices when telecommuting as well as when working at the Center.

b. Managers are committed to eliminating job hazards, including ergonomic hazards, to maintain a safe and healthful working environment. Managers shall:

(1) Track ergonomic concerns and solutions in their area. Request an rgonomic evaluationthrough Occupational Health, or by directly contacting your company's safety and health professional or the ergonomic team available for your area.

(2) Request an ergonomics evaluation from Occupational Health for any new furniture procurement.

(3) Ensure ergonomic controls are implemented and used regularly.

(4) Ensure policies and practices encourage and do not discourage early reporting of MSDs, their signs and symptoms, and MSD hazards.

(5) Communicate with employees about the effectiveness of the ergonomics program and encourage employee participation.

(6) Refer employees suffering from MSD symptoms to the JSC Clinic for evaluation and medical follow-up.

(7) Ensure recommendations made during an employee ergonomic evaluation are implemented and are effective in solving the employee's concerns.

(8) Procure ergonomic equipment and accessories for employees, whenever possible.

(9) Notify employees when office furniture is specific to your organization and requires special maintenance reporting procedures.

5.5.8 Training to recognize and correct ergonomic hazards

5.5.8.1 Ergonomic training is an effective way to reduce ergonomic injuries. This training is recommended on initial assignment and at least every 3 years thereafter. If you are:

a. A new employee or one who has been reassigned, initial orientation and hands-on training should include:

(1) Properly arranging the workstation.

(2) Caring for, using, and handling any equipment.

(3) Using special tools and devices associated with individual workstations.

(4) Using proper lifting techniques.

(5) How to recognize MSD signs and symptoms.

(6) How to report MSD signs and symptoms and the importance of early reporting.

b. Supervisor or manager training is similar to employees' training and includes:

(1) Recognizing early signs and symptoms of MSDs and hazardous work practices

(2) Effectively managing the ergonomic hazards in their areas of responsibility

c. Plant engineer or maintenance person training should include how to prevent and correct ergonomic hazards through job and workstation design and proper maintenance.

5.5.9 What to do if you have problems from ergonomic hazards

5.5.9.1 If you have concerns about ergonomic issues or hazards, follow the flowchart in Figure 5.5-1 to start an investigation, do an evaluation, resolve a concern, or receive a medical evaluation. If you have any of the following symptoms of a potential MSD, report them to your supervisor and go to the JSC Clinic. They will notify Occupational Health to perform an ergonomic evaluation of your workstation. Watch for persisting or recurring:

a. Pain from exertion, pressure, or exposure to cold or vibration, except when the pain is due to an acute injury such as a burn, an abrasion, a splinter, a slip, or a fall.

b. Skin color becoming blue, abnormally white, or red on exposure to cold or vibration.

c. Numbness or tingling in an arm, a leg, a hand, or a foot.

d. Decreased grip strength.

e. Decreased range of joint movement.

f. Swelling of a joint or part of an arm, a leg, or a digit.

5.5.10 Responsibility for the JSC ergonomics program

5.5.10.1 Occupational Health is responsible for the formal ergonomics program and shall:

a. Help other organizations perform evaluations, develop job-specific programs, and train employees.

b. Provide medical evaluation through the JSC Clinic, as well as case management coordination.

c. Provide computer-based training that covers both general ergonomic principles and JSC site-specific processes.

d. Coordinate with contractor safety and health professionals, and area ergonomic teams to communicate program changes and consult on evaluations.

e. Evaluate proposed new furniture procurements and provide ergonomic requirements.

f. Coordinate procedures for communicating furniture change requests with the JSC Furniture Office.

g. Assess whether proposed alternative workstations and task seating are safe and permissible for use at JSC based on current ANSI/BIFMA (Business and Institutional Furniture Manufacturers' Association) standards for office furniture and ANSI/HFES (Human Factors and Ergonomics Society) standards for computer workstations.

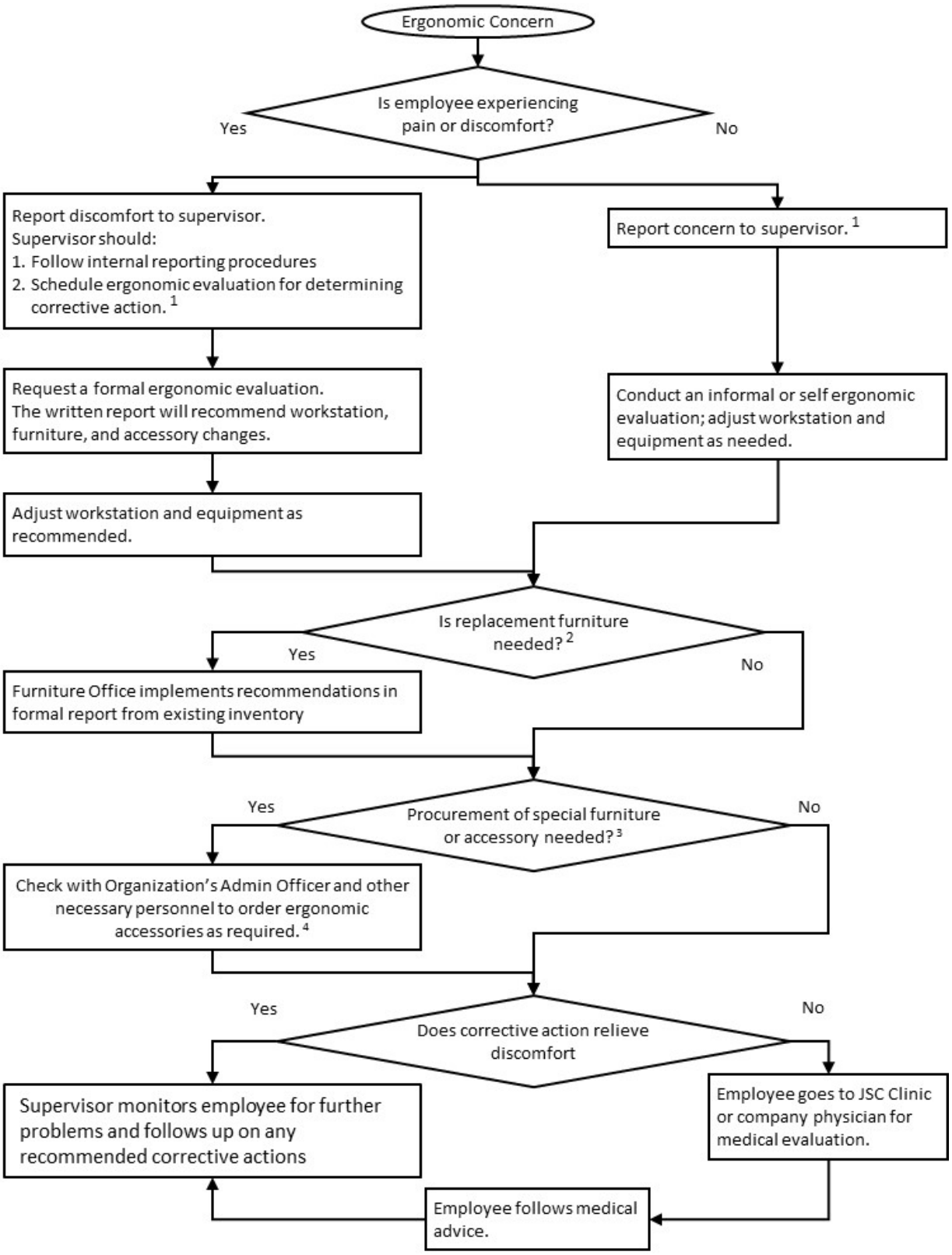

Figure 5.5-1 Flowchart to Address Ergonomic Hazards

Footnotes:
1 Notify the Center Disability Program Manager or contractor counterpart when a concern or an evaluation involves a reasonable accommodation for a disability or medical condition.
2 Note: Furniture will only be replaced when determined necessary by an ergonomic evaluation performed by a member of the JSAT Ergonomics Committee and include the JSC Logistics Checklist. Evaluation reports are sent to the employee's supervisor, the JSC Furniture Office, and the Disability Program Manager or contractor counterpart as required.
3 Check the Occupational Health's Try-Before-You-Buy library of ergonomic accessories to borrow and evaluate a specific accessory before purchasing.
4 Notify the Center Disability Program Manager before any purchase to see if the recommended accessory is available through another federal program.

5.5.11 Providing furniture and accessories for computer workstations

a. The JSC Furniture Office manages the inventory of office furniture used at the center, including warehouse storage, office moves, and furniture maintenance.

b. When the JSC Furniture Office inventory does not allow timely filling of requests, contractors may provide chairs and other necessary furniture for their on-site employees. Clearly mark this furniture with the contractor's name to prevent confusion of ownership.

   NOTE: The JSC Furniture Department does not support contractor-owned furniture repair or replacement.

c. The employee's management is responsible for providing ergonomic accessories, such as adjustable height workstations, specialized seating, footrests, document holders, telephone headsets, trackballs, mouse rests or pads, ergonomic keyboards, and monitor risers.

   NOTE: The employee's organization is responsible for installation, transportation, and maintenance of ergonomic accessories.

d. Contact the JSC Disability Program Manager for civil servants or the contractor counterpart when the accessory is required as a reasonable accommodation for a disability or medical condition, as they may have alternative resources available to obtain it.

5.5.12 Using non-standard furniture

JSC office furniture meets ANSI/BIFMA (Business and Institutional Furniture Manufacturers' Association) standards for office furniture and ANSI/HFES (Human Factors and Ergonomics Society) standards for computer workstations. Use of non-standard, alternative workstation furniture or task seating (such as a treadmill with a desk or an exercise ball for a chair) is not permitted at JSC until it has an associated ANSI/BIFMA standard and demonstrated compliance.

5.5.13 Follow up on recommendations made during an ergonomic evaluation

5.5.13.1 Follow-up on ergonomic evaluations is as follows:

a. Supervisors shall follow up to ensure that recommendations for arranging workstations and changes in furniture were effective and have not caused additional discomfort.

b. Case management personnel from the JSC Clinic or your employer may follow up on ergonomic evaluations due to pain or discomfort.

c. Occupational Health will follow up when necessary at the request of employees, supervisors, or case managers.

5.5.14 For more information on ergonomics

Contact Occupational Health (x36726) if you desire more information on ergonomic hazards.