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I. PURPOSE

SUNY Geneseo's ergonomics program has been implemented to reduce the number and severity of musculoskeletal disorders (MSDs) caused by exposure to hazards in the workplace. MSDs are caused by overuse or repetition involving muscles, nerves, tendons, ligaments, cartilage, joints and spinal disks. The intent of SUNY Geneseo's ergonomics program is to quickly address problems and implement controls that reduce those problems. It is the policy of SUNY Geneseo to provide an environment free from recognized hazards that could cause injury or illness.

Ergonomics is defined as fitting the workplace to the worker and examining the interaction between the worker and his/her environment. Other commonly used synonyms include: cumulative trauma disorders (CTD) and repetitive strain injuries (RSIs). The primary tools of the ergonomics program are: worksite evaluations, employee and supervisor training, and implementation of ergonomic control strategies. Ergonomics should not be seen as a one-time effort; it is a continuous, on-going approach used in optimizing the working environment.

One of the key aspects of the ergonomics program is identifying and educating employees who are at high risk of developing MSDs. Early identification of symptoms with prompt intervention helps prevent more serious or chronic problems. Training is available by Environmental Health and Safety on the following subjects: Office Ergonomics, How to Reduce Ergonomic Risk Factors: Fitting the Workplace to the Worker, and Back Safety.

II. PERSONNEL AFFECTED

All SUNY Geneseo staff and faculty members are responsible for contributing to a safe and healthy work place. Employees are encouraged to review information and to participate in education and training opportunities that can enable them to contribute to a healthy work environment. Since non-work activities can also cause or contribute to discomfort and/or medical impairments, employees are urged to apply ergonomic principles outside the workplace as well.

III. DEFINITIONS

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Cumulative Trauma Disorder (CTD) commonly used term, same as MSD.

Ergonomics- defined as fitting the workplace to the worker and examining the interaction between the worker and his/her environment.

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Musculoskeletal Disease- (**MSDs**) is caused by exposure to hazards in the workplace such as overuse or repetition involving muscles, nerves, tendons, ligaments, cartilage, joints and spinal disks.

Repetitive Strain Injury- (RSI) commonly used term, same as MSD.

IV. RESPONSIBILITIES

A. Managers/Supervisors/Dept. Chairs:

Managers/Supervisors/Dept. Chairs play a leading role in the implementation of strategies to control MSDs in the workplace.

These include:

- Learning about MSD causes and control options;
- Providing resources to implement ergonomic solutions;
- Performing or requesting periodic risk assessments to identify ergonomic hazards;
- Purchasing furniture that has maximum adjustment flexibility and complies with standards established by the American National Standards Institute (ANSI).
- Develop procedures to respond to employee concerns about MSD problems;
- Restructuring job tasks to reduce risk factors, which contribute to MSD's;
- Encouraging supervisors to implement steps to control MSD's in the workplace;
- Providing training to supervisors and employees.

Managers/Supervisors/Dept. Chairs must provide employees with appropriate ergonomics training, reinforcement, assistance, and evaluations. There are several ways this can be accomplished:

- Promote a safe and healthy work environment;
- Maintain an awareness of MSD risks;
- Have the work environment appropriately evaluated for proper ergonomic practices and conditions;
- Provide proper workstations and assistive devices;
- Promptly report all employee injuries and/or employee complaints regarding repetitive motion injury symptoms;
- When necessary, seek assistance from EHS regarding ergonomic issues;
- Provide adequate recovery time by allowing employees engaged in highly repetitive tasks the opportunity for frequent, short, alternative work activities and breaks;

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• Integrate ergonomics into total department safety management.

C. Employees:

Prompt implementation of workplace changes can significantly reduce the potential for severe injuries or illnesses. It is required those employees:

- Report work-related MSD signs and symptoms to their supervisor;
- Follow safe work practices;
- Make effective use of recovery periods;
- Perform simple exercises and stretches as recommended by the evaluator;
- Follow ergonomic recommendations;
- Adjust and use their workstation and equipment as outlined in the ergonomic guidelines (see appendices).

D. Environmental Health and Safety Office:

- Coordinates the ergonomics program to reduce repetitive motion injuries at SUNY Geneseo;
- Provides guidance on modifying the workplace to minimize the potential for injuries and illnesses;
- Provides ergonomics training for employees, supervisors, and managers, Dept. Chairs
- Analyzes and report trends in injury or incidence, and severity;
- Evaluates individual and departmental workstations;
- Provides assistance and advice on the selection of ergonomically sound furniture and equipment.

V. PROCEDURES - Process for Minimizing Ergonomic Hazards

A. Awareness of Musculoskeletal Disease (MSDs)

Signs and symptoms of MSD's of the upper extremities include pain, numbness, or tingling of the fingers, wrists, elbows, or shoulders. Chronic back and neck problems may result in pain, numbness, or tingling that radiates to the arms or legs, as well as limited back motion.

B. Preventive Actions

Reducing the risk of MSD problems can be achieved by doing the following:

- Evaluating the workplace to identify MSD risk factors;
- Encouraging employee awareness and providing education;

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- Using ergonomically appropriate work habits;
- Making workplace adjustments;
- Using ergonomically designed tools and furniture (i.e., providing flexibility for adjustments and allowing for proper individual posture);
- Performing workplace exercises to relieve physical stress;
- Performing five minutes of alternative work activity for every 30 minutes of continuous, high intensity, repetitive work (for example: after two hours of continuous keyboarding, devote 15 minutes to non-repetitive motion activities like returning phone calls or filing);
- Evaluating and intervening as soon as symptoms of MSD occur.

C. Early Intervention

Early intervention is essential to the quick recovery and long-term prevention of MSDs. It is extremely important for employees to report any MSD symptoms as soon as possible. MSD's usually develop gradually; symptoms such as pain, numbness, and tingling in the upper extremities are often ignored until the condition becomes chronic or permanent injury occurs. Employees experiencing symptoms are encouraged to contact their supervisor, or EHS to schedule an ergonomic evaluation.

D. Workplace Evaluations

The ergonomics program and services described in these guidelines are applicable to all persons working at SUNY Geneseo. Priority will be given to employees with reported MSD symptoms, employees with diagnosed MSD's, and employees who work in identified high-risk jobs or departments. EHS staff members are available to help you with evaluating and redesigning your workstation, tasks, and work practices. Call x5812 to schedule a workstation evaluation.

E. Reporting

Employees experiencing signs and symptoms of MSDs need to report to their supervisor. Supervisors may contact EHS for a workplace evaluation.

F. Training

EHS can provide both individual and group education during worksite evaluations or as requested on the following: information and education regarding sound ergonomic principles and practices.

G. Record Keeping

Records of employee reports of MSDs, MSD signs and symptoms, MSD hazards, responses to such reports, workstation/worksite assessments and hazard control

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measures are kept on file at EHS. Records of work restrictions and workers compensation are kept on file at HR. Employees their representatives and upon written permission, are provided with access to these records.

VI. REFERENCES

OSHAs Ergonomic recommendations for general industry

VII. APPENDICES/FORMS

Appendices A-F is provided to assist in developing an ergonomically sound workstation and guidelines for proper body mechanics. The appendices cover computer workstation set-up, hand tool ergonomics, laboratory ergonomics, manual materials handling guidelines and purchasing furniture and accessories.

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APPENDIX A

Computer Workstation Guidelines

Chair: Chairs should have an adjustable back to provide support for the lumbar region of the back and trunk. High-back chairs provide extra upper back support. Select a chair with easily adjustable height to permit the feet to rest flat on the ground with the upper legs parallel to the floor. A footrest may be needed by some people to achieve this position. Chairs should have a five-star base and casters compatible with the floor surface. T-armrests with adjustable height and width are recommended for intensive computer users. When seated, the seat pan should not hit the back of knee.

Work Surface: Work surfaces should be large enough to accommodate all the computer equipment, including a wrist rest in front of the keyboard and adequate viewing distance between the monitor and operator's eyes. A keyboard tray can be used to increase depth and to provide proper keying level. There should also be enough room under the work surface to allow free leg movement. The height of the work surface should allow the forearms to be parallel with the floor when working at the computer, while not forcing the shoulders to be elevated. A footrest can assist in supporting the feet as well, allowing the employee to sit back in his/her chair.

Keyboard/Input Device: The keyboard and input device (mouse or trackball) should be at the same level and in front of the operator. The height of the keyboard and input device should allow the operator to position their forearms and hands parallel to the floor. Achieve this by adjusting the height of the chair and/or table, or by using an adjustable tray. A padded wrist rest for the keyboard and input device should be used to prevent the operator's wrists from coming in contact with the work surface when the arms are at rest. Avoid overreaching by keeping the input device close to the body.

Monitor (Terminal): Position the monitor directly in front of the operator with the screen at approximately eye level. One exception is bifocal wearers who may prefer a slightly lower monitor level. Monitors should have good contrast, sharp focus, and be free from flickering and glare to minimize eyestrain.

Document Holder: Position the document holder at eye level, close to the monitor.

Phone Head Set: Headsets reduce awkward neck and shoulder postures, notably by eliminating the habit of cradling the phone between the shoulder and chin. Headsets are particularly beneficial for people who work on the phone and computer simultaneously.

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Lighting: Excessive overhead lighting can cause glare and eye discomfort. Dimming overhead lights and use of a task lamp can reduce eye fatigue. Monitor shades and glare screens also reduce glare. Adjust monitor contrast and brightness for maximum personal comfort.

A Well Designed Computer Workstation



Document holder is same height and distance from the user as the screen



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APPENDIX B

Hand Tool Ergonomics

Proper attention to selection, design, and layout of tools can help minimize the risk of developing repetitive motion injuries. Four basic principles can be applied when working with hand tools:

- Avoid high contact stress and static exertions.
- Avoid extreme or awkward joint positions (i.e., bent wrist position).
- Avoid repetitive finger action.
- Avoid tool vibration (select power or pneumatic tools with built-in vibration dampening whenever possible).

The following guidelines can help with the selection and design of tools.

- Handles should be provided whenever possible. A properly designed handle isolates the hand from contact with the tool surface, enhances tool control, and increases mechanical advantage while reducing the amount of required exertion. Tool handles should be non-porous, non-slip, and non-conductive.
- Soft coverings on a tool handle protect the hands from heat and cold and help reduce pressure points and slipperiness of the grip.
- Select hand tools that fit the hands of the worker. A tool that is too large or too small will produce stress in the hand and wrist. As a general rule, the ideal handle diameter for a man is 1.5 inches, and 1.3 inches for a woman.
- Tools with a pistol grip should be used where the tool axis must be horizontal. A straight grip should be used where the tool axis is vertical, or where the direction of force is perpendicular to the work plane. Bent tool grips allow the wrist to maintain neutral postures.
- For trigger-activated tools, choose a grip size that allows activation with the middle part of the fingers. Activation with the fingertips can create nodules on nerve sheaths and cause *trigger finger*.
- The majority of commercially available tools are designed for the right hand. Ideally, tools should be symmetrical or easily altered to be used by either the right or left hand.
- The provision of automatic spring opening on tools such as scissors and pliers will enable the worker to use the strong hand-closing muscles rather than the weak hand-opening muscles.

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Correct positions for holding hand tools are illustrated below:

Correct Positions for Holding Hand Tools



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APPENDIX C

Laboratory Ergonomics

Reprinted from Fisher Scientific

The Pressure of Pipetting

Pipetting involves several ergonomic stressors - thumb force, repetitive motions and awkward postures, especially of the wrists, arms, and shoulders. And these can be exacerbated by the mental pressure resulting from the accuracy, precision, and timing demanded in many pipetting procedures. When pipetting is done for more than 300 hours in a year, the prevalence of hand and shoulder pain increases.

Recommended Protective Measures for Pipetting

- Rotate pipetting tasks among several people.
- Take short micropauses of a few seconds, when you can't take a longer break.
- Use only the force necessary to operate the pipetter.
- Choose pipetters requiring the least pressure.
- Work with arms close to the body to reduce strain on shoulders.
- Keep head and shoulders in a neutral position (bent forward no more than 30 degrees).
- Use adjustable chairs or stools with built-in solid footstools. Don't use a foot ring, which could compress blood vessels in feet, and don't use high stool which can force you to work with a bent neck.
- Don't elevate your arm without support for lenthy periods.
- Use shorter pipettes. This decreases hand elevation and consequent awkward postures.
- Use low profile waste receptacles for used tips. They should be no higher than the top of the tubes being filled.

Posturing at Microscopes

Using a microscope involves several ergonomic stressors – sitting for long periods of time, awkward postures, and stresses on wrists, arms, elbows, and shoulders.

Recommended Measures for Using a Microscope

• Don't use a microscope for more than five hours per day. Spread use out over the entire workday so you don't spend long uninterrupted periods at it.

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- Keep scopes cleaned and use illuminators and shadow boxes properly to avoid visual and musculoskeletal strain.
- Adjust chair height so thighs are horizontal and feet flat on the floor. Chairs should be adjustable from 15-21 inches.
- Make sure the backrest provides proper lumbar support and be sure to readjust when you change positions.
- Select chairs with padded armrests to rest your arms on and increase stability without compressing the ulnar nerve in your arm.
- Position work surfaces high enough to allow close inspection without inclining your head beyond 17-29 degrees.
- Use a cutout worktable. This puts you close to the scope yet gives an area for supporting forearms.

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APPENDIX D

Other Workplace Ergonomics

There are a variety of other work settings where ergonomic practices are important (i.e., manual material handling, custodial work, maintenance, gardening, etc.).

Principles for Manual Material Handling (MMH) Work Design

Eliminate the Need for Heavy MMH

The optimal solution to MMH-related problems is to eliminate the need for heavy work MMH. In general, two means exist to accomplish this:

- The use of mechanical aids such as hoists, lift trucks, lift tables, cranes, elevating conveyors, gravity dumps, and chutes can eliminate (or at least significantly decrease) stresses due to MMH.
- To eliminate heavy MMH, change the work area layout to make all materials available at work level. Accomplishing this objective can involve either a change in work level height or the level of the worker.

Decrease MMH Demands

If MMH cannot realistically be eliminated, then attempts should be made to decrease the MMH demands of the job. There are several means by which this second principle of work design can be accomplished:

- Decrease the weight of the object being handled. Assigning the handling to two or more people, by distributing the load into two or more containers, or reduce the weight of the object by reducing the capacity of the container or the container weight (i.e., using plastic drums rather than metal drums).
- Change the type of MMH activity so the demands of the job can be decreased. Lifting, lowering, pushing, pulling, carrying, and holding are all types of MMH activity. It is preferable for a job to require mechanical lifts rather than lifting, to require using a cart or dolly rather than carrying, and to require pushing rather than pulling. (For instance, make several trips with lighter loads.
- Changes in the work area layout can decrease MMH-related demands. Some ways in which this can be accomplished include: minimizing the horizontal distance between the starting and ending points of a lift, limiting stacking heights to the shoulder height of the worker, and keeping heavy objects at the knuckle height of workers.

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• Maximizing the time available to perform the job can decrease job demands. Accomplish this by reducing the frequency of the lift, and by incorporating work/rest schedules or job rotation programs into the work design.

Minimize Stressful Body Movements

The third principle of work design is to minimize stressful body movements required by the job. Specifically, bending and twisting motions imposed on the worker should be reduced.

- Reduce bending by locating objects to be handled within the arm-reach envelope of the worker. Provide all material at the work level of the worker. Avoid using deep shelves where the worker must bend and reach to obtain objects toward the rear of the shelves.
- Locating objects within the worker's arm-reach envelope can also reduce twisting motions. Arrange the work area to allow sufficient space for the entire body to turn and pivot with the feet. If the worker is seated, an adjustable swivel chair should be used.
- Design considerations should allow the worker to lift objects in a safe manner. Practice and encourage the safe lifting techniques described below.

Safe Lifting and Good Body Mechanics

- Allow the object to be handled close to the body.
- Use devices such as handles, grips, etc., to provide better control of the object being lifted or moved.
- Balance the contents of the containers.
- Provide rigid containers for increased worker control of the object.
- Avoid lifting excessively wide objects from floor level.
- Use good body mechanics; bend your legs, not your back, when lifting.
- Pivot with your feet instead of twisting your back when lifting.

Recognize the Risk for Repetitive Motion Injury (RMI)

OSHA has identified five specific situations, which it says creates significant risks for RMI, if incurred over a period of more than two, three, or four hours:

• Performing the same motion or motion pattern for more than two hours continuously or four hours daily.

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- Maintaining an unsupported fixed or awkward posture for more than one hour continuously or four hours daily.
- Using vibrating or impact tools or equipment for more than one hour continuously or two hours daily.
- Using forceful hand exertions for more than two hours daily.
- Unassisted frequent or heavy lifting

Recovery Cycles

Ergonomists agree that the most important measures to prevent stress injuries are pretty straightforward. They are:

- Take frequent breaks
- Move around
- Do not repeat the same motions and postures
- Avoid awkward motions and postures
- Perform stretching exercises to keep body fit and strong
- Practice good nutritional habits
- Expand the tasks each person performs to minimize the constant repetition of any one particular task

The theory behind this advises: providing recovery time - time for your body to recover from exertions. Awkward postures, repetitions, use of force are not bad in themselves. However, when sustained over time so that your body does not have time to recover, the result can be overexertion, injury, and perhaps permanent damage.

It is also critical to recognize cumulative stress and the need to balance tasks and activities. Without recovery periods, ergonomic stresses incurred during one activity become cumulative with those from another, but similar activity. For instance, hand movement stresses you incur in the lab can be cumulative with those you incur playing at the piano. Balance these activities and allow adequate recovery periods.

Sit/Stand Workstation

Work surface height for a sit/stand workplace varies depending on the primary job tasks. The recommended height for tasks involving large-size products or drawings is 44 inches above the floor. Adequate leg clearance also reduces static loading on the legs and back of the worker. For tasks that can be done while sitting or standing, the recommended work surface height is 40 inches above the floor. Items placed lower than 40 inches will cause stooping and excessive static exertions on the back and shoulder muscles, especially for taller workers.

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Anti-Fatigue Mats

Anti-fatigue mat provide additional support for the worker at standing and sit/stand workstations. Mat size should be large enough for the worker to stand entirely on the mat when at the workstation. Select a mat free of raised or irregular surfaces that will cause concentrated forces on the feet of the worker.

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APPENDIX F

Purchasing New Furniture and Accessories

- Choose adjustable furniture and chairs. Plan ahead by anticipating future changes in tasks and employee needs.
- Involve all potential users in the selection process by having people try out products before purchasing.
- Have a product representative provide training on the features and proper use of the product.

Look for these preferred features when shopping for chairs and furniture:

Chairs

- Pneumatic seat pan height
- Backrest height
- Backrest angle and lock
- Forward tilt
- Swivel with five star base
- Adjustable armrest height and width

Table and Desk

Adjustable work surface

- Adequate dimension
- Work surface edges and corners are smooth, without sharp edges
- Adequate leg clearance and space
- Non-glare finish

Keyboard Drawer/Articulating Arm with Tray

- Height adjustment
- Extended to accommodate the mouse
- Built-in soft wrist rest (not the metal lip); or enough room for an add-on wrist rest
- Make sure there will be adequate legroom once the keyboard drawer is installed

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VIII. REVISION HISTORY

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