UNIVERSITY OF ROCHESTER

Ergonomics Program

Prepared by:

THE OCCUPATIONAL SAFETY UNIT of ENVIRONMENTAL HEALTH & SAFETY

Revised 2/2024

TABLE OF CONTENTS

INTRODUCTION		3
SECTIO	N 1: Minimizing Ergonomic-Related Injuries	4-6
I. Minimizing ergonomic-related injuries		4
A.	Employee Participation	
В.	Training	
C.	Program Evaluation	
II. Resp	onsibilities	5-6
Α.	Managers/Supervisors	
В.	Employees	
C.	Environmental Health & Safety (EH&S)	
D.	Human Resources Department	
E.	UR Procurement Department	
SECTIO	N 2: Minimizing Ergonomic Hazards	7-8
١.	Awareness of Musculoskeletal Disorders (MSDs)	
١١.	Preventive Actions	
III.	Early Intervention	
IV.	Workplace Evaluations	
V.	Recordkeeping	
APPENDICES		9-19
I.	Computer Workstation Guidelines	
II.	Ergonomic Handouts	
III.	Sit/Stand Workstations	
IV.	Laboratory Ergonomics	
۷.	Principles for Manual Material Handling (MMH)	
VI.	Purchasing New Furniture and Accessories	

VII. External Resources

INTRODUCTION

The University of Rochester Ergonomics Program has been established to reduce the number and severity of Work-Related Musculoskeletal Disorders (WRMSDs) caused or contributed to by exposure to ergonomic stressors in the workplace.

Musculoskeletal Disorders (MSDs) are injuries caused by overexertion, overuse or excessive repetition involving muscles, nerves, tendons, ligaments, cartilage, joints and spinal disks. Other commonly used terms for these types of injuries include cumulative trauma disorders (CTDs) and repetitive strain injuries (RSIs).

The U of R Ergonomics Program is intended to provide guidance in the identification of ergonomic hazards and the implementation of controls that will reduce the potential for injury due to those hazards. It is the policy of the University of Rochester to provide an environment free from recognized hazards that could cause injury or illness.

Ergonomics is defined as the study of the interaction between the worker and his/her work environment, with the objective of fitting the workplace and tasks to the worker.

Ergonomics should not be seen as a one-time effort, but as a continuous, on-going process used to optimize the working environment.

Early identification of symptoms with prompt intervention helps prevent escalation of minor discomfort into more serious or chronic injuries. Training on the following subjects is available through MyPath, EH&S, or the Center for Nursing Professional Development:

- Office Ergonomics
- Back Safety/Safe Manual Material Handling Strategies
- Safe patient handling

The University's Ergonomics Program is divided into two sections: Section 1 outlines the manner in which the University is working to minimize ergonomic-related injuries through management leadership, employee participation, training, program evaluation, and defining responsibilities; Section 2 focuses on processes for minimizing ergonomic hazards. Lastly, there are multiple appendices designed to provide helpful information on specific subjects.

SECTION 1: MINIMIZING ERGONOMIC-RELATED INJURIES

I. Minimizing Ergonomic-Related Injuries Through Employee Participation, Training, and Program Evaluation:

The University's goal is to minimize ergonomic-related injuries through participation by employees, training provided, and by EH&S program evaluation, outlined below in detail. Communication of the Ergonomics Program is provided through training sessions, new hire training, participation in employee health and wellness fairs, articles in the University's internal news publications, and other resources such as the EH&S web page and pamphlets.

A. Employee Participation: Strive for early reporting of MSDs and active involvement by employees and their representatives in the implementation and evaluation of the Ergonomics Program.

When employees experience an MSD sign or symptom, it should be reported to their supervisor. Staff is involved with the selection and implementation of ergonomically designed equipment including furniture, carts, tools and lifting equipment.

B. Providing Training: Training resources are provided by EH&S for managers, supervisors, and employees on the ergonomics program and their role in it; the recognition of MSD signs and symptoms; the importance of early reporting; the identification of ergonomic hazards in the workplace; and the methods to control ergonomic concerns.

Training is provided to staff members through such programs as New Hire Orientation, MyPath on-line training, on-request ergonomics training provided by EH&S, workstation assessments conducted by EH&S at no cost to the employee or his/her department (however, any recommended equipment must be purchased by the employee's department), pamphlets, and the EH&S website.

C. Program Evaluation: EH&S conducts reviews of training materials, annually reviews reported ergonomic incidents, tracks the number of ergonomic assessments given, and performs other evaluation as needed. These metrics are reported annually internally through the Department Annual Report.

II. Responsibilities:

All U of R 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 cause or contribute to discomfort and/or injuries, employees are urged to apply ergonomic principles outside the workplace as well.

A. Managers/Supervisors:

Managers play a leading role in the implementation of strategies to control MSDs in the workplace.

This includes:

- Learning about MSD causes and control options;
- Providing resources to implement ergonomic solutions and remediation;
- Purchasing furniture that has maximum adjustment flexibility and complies with standards established by the American National Standards Institute (ANSI) and UR furniture guidelines;
- Restructuring job tasks to reduce risk factors which contribute to MSDs;
- Connect employees to training resources;
- Promptly <u>reporting</u> all employee injuries and/or employee complaints regarding repetitive motion or overuse injury symptoms;
- When necessary, seeking assistance from EH&S regarding ergonomic issues including ergonomic requests;
- Providing adequate recovery time by allowing employees engaged in highly repetitive tasks the opportunity for frequent, short breaks and alternative work activities where feasible.
- B. Employees:

Employees must promptly report ergonomic problems to their supervisors. Prompt implementation of workplace changes can significantly reduce the potential for severe injuries or illnesses. Employees are required to:

- Report work-related MSD signs and symptoms to their supervisor and <u>submit</u> an ergonomic request as needed for computer users;
- Follow safe work practices;
- Make effective use of recovery periods;
- Follow ergonomic recommendations;
- Adjust and use their workstation and equipment as outlined in the ergonomic guidelines or self-assessment (see appendices).

- c. Environmental Health & Safety (EH&S):
 - Coordinates the Ergonomics Program to reduce ergonomic-related injuries at UR;
 - Provides assistance in using <u>Employee Incident Reporting System</u> (Cority) and encourage its use, including the ergonomic self-assessment;
 - Provides guidance on modifying the workplace to minimize the potential for injuries and illnesses;
 - Provides ergonomics training for employees, supervisors, and managers;
 - Reviews employee incident reports on an ongoing basis to track MSDs;
 - Evaluates individual and departmental workstations and work areas as requested;
 - Provides assistance and advice on the selection of ergonomically appropriate office furniture and equipment.
- **D.** Human Resources Department:

The Human Resources Department manages the Workers' Compensation Insurance and Return to Work Programs. The Return to Work (RTW) Program is designed to help University employees reach full recovery following illness or injury by providing timely and appropriate treatment while the employee continues in worthwhile and meaningful work. Refer to <u>University Policy # 271</u>.

E. UR Procurement Department:

EH&S will normally list recommended vendors in the written ergonomic assessment for computer workstations. The UR Procurement Department can provide more specific assistance and advice on Vendor information where needed. They can be reached at 275-2002 or from their <u>website</u>.

SECTION 2: MINIMIZING ERGONOMIC HAZARDS

I. Awareness of Musculoskeletal Disorders (MSDs):

Signs and symptoms of MSDs of the upper extremities may 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.

Back pain and other ergonomically-based symptoms can result from acute injury due to a single overexertion incident, or may result from cumulative trauma due to chronic overexertion, improper work practices, or poor working postures. Cumulative trauma may be exacerbated by inadequate work-rest cycles.

II. Preventive Actions:

Reducing the risk of MSD problems can be achieved by:

- Evaluating the workplace to identify MSD risk factors;
- Encouraging employee awareness and providing education through the self-assessment;
- Using ergonomically appropriate work practices;
- Making ergonomically sound workplace adjustments;
- Properly using ergonomically designed tools and furniture (i.e., providing flexibility for adjustments and allowing for proper individual posture);
- Performing five minutes of alternative work activity for every 30 minutes of continuous, high intensity, repetitive work;
- Seeking evaluation and intervening as soon as symptoms of MSD occur;
- Using proper lifting techniques;
- Obtaining assistance or using mechanical lifting devices for tasks that exceed an individual's capabilities.

III. Early Intervention:

Early intervention is essential to the long-term prevention of and quick recovery from MSDs. It is extremely important for employees to report any MSD symptoms as soon as possible. MSDs 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 and/or complete the <u>ergonomic self-assessment</u> for office-related concerns on the EH&S website.

IV. Workplace Evaluations:

The ergonomics program and services described in these guidelines are applicable to most persons working at UR except those who work at home (except via video call) or outside Monroe County. For those employees outside of Monroe County, please contact <u>Finger Lakes Occupational Health Services</u> or call 244-4771.

Priority will be given to employees with reported MSD symptoms, employees with diagnosed MSDs, and employees who work in identified high-risk jobs or departments. EH&S staff members are available to help with evaluating and redesigning workstations, tasks, and work practices.

For computer workstations, the following process has been laid out:

- An <u>ergonomic self-assessment</u> should first be completed by staff with ergonomic concerns.
- After employees take the self-assessment, they are encouraged to make recommended adjustments for approximately two weeks to see if their concerns are resolved.
- For those still needing assistance after the self-assessment, it's recommended to contact EH&S directly at questions@safety.rochester.edu or call (585) 275-3241 and request an in-person assessment.
- After an in-person assessment, EH&S will send out a report evaluation outlining recommended equipment and other solutions to address the ergonomic concern(s).

For other ergonomic concerns <u>not</u> related to computer workstations, it's recommended to contact EH&S directly at 275-3241.

V. Recordkeeping:

Records of employee reports of MSDs, self-assessments, ergonomic reports, and workstation assessments are kept by EH&S. Records of work restrictions and the HCP's (Health Care Professional) written opinion are kept on file by Leave Administration according to their internal policies and are not kept on file by EH&S.

APPENDIX I Computer Workstation Guidelines and Ideal Workstation Layout

Chair: Chairs should have an adjustable back (height and angle) to provide support for the user's back, especially in the lumbar region. Chairs should have easily adjustable seat height, which should be adjusted to permit the feet to rest flat on the floor with the upper legs parallel to the floor. A footrest may be needed by some people if the work surface is too high. Chairs should have a five-star base for stability and casters compatible with the floor surface: hard casters for carpeted surfaces and rubberized (soft) casters for use on hard floor surfaces. Well-padded armrests with adjustable height and width are recommended for intensive computer users.

Work Surface: Work surfaces should be large enough to accommodate all necessary equipment and provide proper viewing distance. An adjustable keyboard platform may be used to increase depth and to provide proper keyboard angle and height. The edges of work surfaces should be rounded or padded to minimize contact stress on the hands, wrists, forearms, and elbows. There should 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. If the work surface is too high and the chair seat must be raised to match, 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 pointing device (mouse or trackball) should be at the same level and directly in front of the operator. The height of the keyboard and input device should allow the operator to position the forearms and hands parallel to the floor with the fingertips resting on the home row keys. This can be achieved by using an adjustable keyboard platform or by adjusting the height of the chair and/or table. A padded wrist rest for the keyboard and input device should be used to prevent the operator's wrists from coming in contact with a hard work surface.

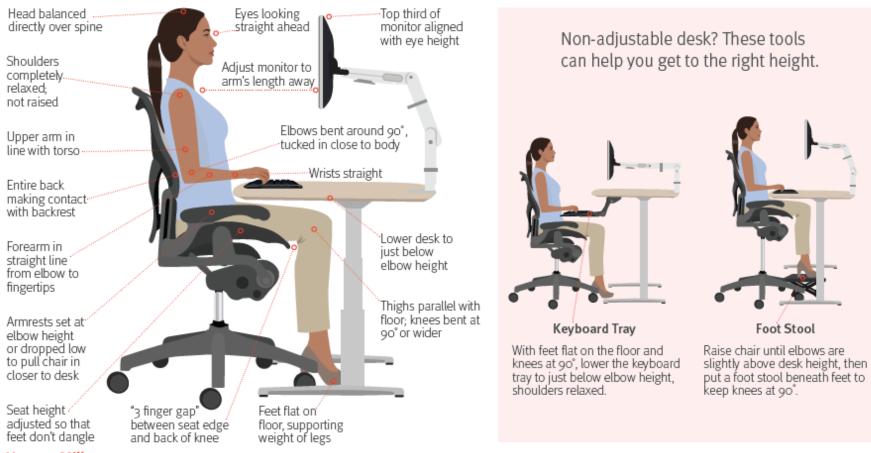
Monitors: Computer monitors should be positioned directly in front of the operator, at a comfortable viewing distance, with the top of the screen approximately at eye level or just below. Those wearing bifocals or trifocals may prefer a slightly lower monitor height. When two monitors are used, they should be placed close together and their combined screen area should be centered in front of the seated work position if they are used equally; if one monitor is used more than the other, it should be moved closer to center. Monitors should have good contrast, sharp focus, and be free from flicker and glare/reflections to minimize eyestrain. Direct glare—bright light from outside windows behind the monitor(s)—may also create eye strain.

Phone Head Set: Headsets reduce awkward neck and shoulder postures, notably by eliminating the need to cradle the phone between the shoulder and chin. Headsets may also assist in workers using voice commands (diction) instead of typing to reduce repetitive wrist motion.

Appendix II Ergonomic Handouts

Ideal Computer Workstation Layouts

Sitting



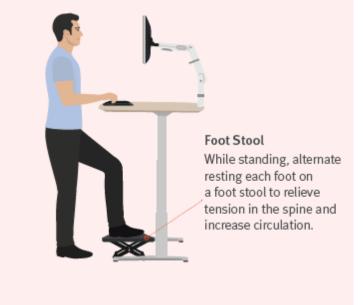
HermanMiller

Standing



HermanMiller

The more movement and change in postures you do, the better you will feel.



© 2017 Herman Miller, Inc.

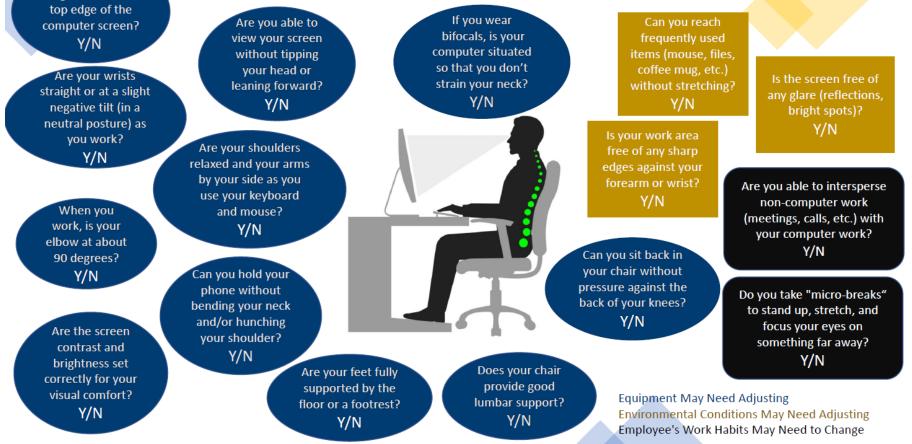
Office Ergonomics Checklist

Is your eye level

aligned with the

Office Ergonomics Checklist

While seated at your computer workstation, use this checklist to analyze your layout and posture.



APPENDIX III

Sit/Stand Workstations

The optimal work surface height for a sit/stand workplace varies depending on the nature of the primary job tasks and the height of the worker. As a result, the ideal work station is adjustable in height. When adjustability is not possible, the recommended height for an average person performing 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 for an average person is 40 inches above the floor; a lower surface may cause stooping and static loading on the back, neck, and shoulder muscles, especially for taller workers. Seated work at a standing-height workstation requires properly designed seating with adequate foot support provided by a sturdy foot rest of proper height and sufficient size to permit periodic postural shifts of the legs while working.

For those interested in exploring a sit/stand workstation, information is available from EH&S on request. An ergonomic assessment is strongly recommended (but not required) prior to purchasing a sit/stand.

Prior to recommending a sit-stand workstation, EH&S typically recommends assessment from a qualified medical professional such as a physician, chiropractor, nurse practitioner, physician assistant, or physical therapist. A copy of the medical professional's determination may be shown to the EH&S staff performing your assessment. In cases where a sit/stand workstation has not been medically indicated, the workstation may be provided to the employee at the discretion of the employee's supervisor/department.

The sit/stand workstation must be obtained through the employee's department's normal purchasing process. Contact the Procurement Department at 275-2002 (website) or EH&S with any questions.

Anti-Fatigue Mats

Anti-fatigue mats provide relief from contact stress to the feet of the worker at standing and sit/stand workstations. Mats should be large enough for workers to stand entirely on the mat when at the workstation. Select a mat free of raised or irregular surfaces that might cause concentrate forces on the feet of the worker. Mats should be designed so they do not create tripping hazards (i.e. beveled edge), and for convertible sit/stand workstations, having an easy-to-stow mat is ideal.

APPENDIX IV

Laboratory Ergonomics

The Pressure of Pipetting

Pipetting involves several ergonomic stressors - force exerted by the thumb, repetitive motions and awkward postures, especially of the wrists, arms, and shoulders. And these can be exacerbated by mental pressure resulting from the need for accuracy, precision, and timing demanded by many pipetting procedures.

Recommended Protective Measures for Pipetting

- Rotate pipetting tasks among several people.
- Take short micro-pauses 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).
- Avoid elevating your arm without support for prolonged 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.

Microscope Use

Using a microscope involves several ergonomic stressors: sitting for long periods of time; awkward postures of the neck, shoulders, upper extremities and back; and stresses on wrists, arms, elbows, and shoulders. Visual muscles may also be subject to static loading due to maintaining convergence and accommodation for a relatively fixed focal distance for prolonged periods.

Recommended Measures for Using a Microscope

- Spread out microscope use out over the entire workday so you don't spend long uninterrupted periods at the task.
- Keep scopes clean and use illuminators and shadow boxes properly to avoid visual and musculoskeletal strain.
- Adjust chair height so thighs are horizontal and feet are flat on the floor. Chair height should be adjustable from 15-21 inches. If necessary, use a foot rest to support the feet and prevent contact stress on the back of the legs.
- Make sure the backrest provides proper lumbar support and adjust the lumbar support so it fits the inward curvature of your lower back. Be sure to readjust when you change positions.
- Select chairs with well-padded armrests to 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 to place you close to the scope while providing support for your forearms.
- Periodically close your eyes or look at an object in the distance to relieve the static loading on your visual muscles.
- Remember the 20-20-20 rule: every 20 minutes or so, look at something 20-feet away for 20-seconds to reduce eye strain.
- Avoid leaning on hard edges—use pads or supports
- Spread microscope work throughout the day and between several people, if possible. Don't use a microscope for more than 5 hours per day.

APPENDIX V

Principles for Manual Material Handling (MMH)

OSHA, the Occupational Safety and Health Administration, does not presently have a standard that specifies quantitative force limits for manual material handling operations, however, the Agency references the <u>Revised NIOSH Lifting Equation</u>, which provides a mathematical means of evaluating MMH tasks for risk of injury. In accordance with NIOSH research, EH&S recommends that lifting tasks have a Lifting Index lower than 1.0, as calculated using the Lifting Equation. For assistance with the NIOSH Lifting Equation, it's recommended to contact EH&S, or take the EHS Ergonomics and Back Safety Training on MyPath.

Eliminate the Need for Heavy MMH

The optimal solution to MMH-related problems is to eliminate the need for heavy 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, carts, and chutes, which can eliminate (or at least significantly decrease) physical stresses due to MMH.
- To eliminate heavy MMH, change the work area layout to make all materials available at work level and as close as possible to the work point.

Decrease MMH Demands

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

- Decrease the weight of the object being handled, including assigning the handling to two or more people.
- 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 lowering rather than lifting, to require pulling rather than carrying, and to require pushing rather than pulling.
- 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

Another principle of work design is to minimize stressful body movements required by the job. Specifically, bending and twisting motions 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.

- Locate objects within the worker's arm-reach envelope to reduce twisting motions of the back. 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

- If an object is too heavy for you to lift safely by yourself, get help.
- Try to handle the object close to the body.
- Use devices such as handles, grips, etc., to provide better control of the object
- Balance the contents of containers.
- Provide rigid containers for increased worker control of the object.
- Avoid lifting objects from floor level, especially those that are excessively wide.
- Use good body mechanics: **bend your legs, not your back, when lifting**.
- Never twist your back when lifting; instead, turn with your feet.

Recognize the Risk for Repetitive Motion Injury (RMI)

OSHA has identified five specific situations, which create significant risks for RMI, if incurred over a period of more than two to four hours:

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

Recovery Cycles

Other important measures to prevent repetitive motion injuries include:

- Taking frequent breaks
- Moving around and changing postures frequently
- Do not repeat the same motions and postures
- Avoiding awkward motions and postures
- Performing relief exercises
- Minimizing the constant repetition of any one particular task as able

Without recovery periods, ergonomic stresses incurred during one activity become cumulative with stresses from another similar activity. For instance, hand movement stresses you incur in the lab can be cumulative with those you incur performing other activities such as using a computer keyboard or playing the piano. It is crucial to balance these activities and allow adequate recovery periods.

Appendix VI

Purchasing New Furniture and Accessories

Purchasing of new furniture and accessories for ergonomic needs should be done by the Department Administrator or equivalent. EH&S does not procure ergonomic equipment under normal circumstances. Follow these recommendations in procuring new furniture:

- Choose furniture and chairs that will adjust sufficiently to fit all of the employees who will be using them. Plan ahead to anticipate changes in tasks and employee needs.
- An ergonomic assessment with EH&S and/or completion of the selfassessment is encouraged to ensure that appropriate equipment is selected, though Departments are responsible for procurement with or without.
- Work directly with vendors in finding demo products where available. EH&S has demo ergonomic mice available.

Preferred Features of Furniture

Chairs

- Pneumatic seat pan height adjustability
- Proper seat depth (front edge to backrest)
- Backrest and neck support height adjustable
- Backrest angle and lock
- Adequate lumbar support
- Forward tilt/seat angle adjust
- Swivel with five-star base
- Padded armrests with adjustable height and width
- Waterfall front edge on seat pan
- Casters that are appropriate for the floor on which they will be used

Table and Desk

- Adequate dimension for monitor(s) and accessories
- Work surface edges and corners are smooth, rounded, without sharp edges
- Adequate leg clearance and space under work surface
- Non-glare finish

Keyboard Drawer/Articulating Arm with Tray

- Built-in soft wrist rest (no metal lip)
- Height and angle easily adjustable
- Adequate legroom under the keyboard drawer/platform once installed
- Designed to accommodate the mouse next to keyboard and on same level

If there are specific questions about Vendors or payment, contact the Procurement Department at 275-2002 (website), or reach out to EH&S at 275-3241 or e-mail questions@safety.rochester.edu.

APPENDIX VII External Resources

Patient Care Lifting Guidelines

URMC Patient handling, including lifting, transferring, and repositioning, is covered by SMH Policy 10.22 Minimal Lift for Patient Handling. This policy is available under URMC policies for URMC staff only and not maintained by EH&S.

Hand Tool Ergonomics

NIOSH has provided a <u>guide</u> to selecting non-powered hand tools for best ergonomics. It's a recommended resource for employees in the Trades and other positions that use hand tools regularly.

Ergonomic Self-Assessment Instructions

For computer users, this self-assessment tool is recommended as a first step. Instructions can be found on our <u>website</u>.