Welcome to Preventing Strain Injuries in Labs Training.
This recommended training course is designed for lab personnel.
Topics to be covered include:

- What is Ergonomics?
- Proper Lifting
- General Workstation Setup
- Task Specific Guidance
- Reporting Injuries
WHAT IS ERGONOMICS?
A literature search would return a definition focusing on designing equipment and tasks that allow the worker/employee to perform their work in a neutral or natural position. The thought is that this position will result in a smaller risk for injury.
Simply, ergonomics is how we do something and how it affects our bodies.

While much attention has been given to the computer workstation, ergonomic concepts can be applied to many occupations and tasks.

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<th>What is Ergonomics?</th>
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<td>• Simply is how we do something and how it affects our bodies.</td>
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<td>• Workplace and non-workplace examples.</td>
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<td>• Parents lifting small children.</td>
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<td>• Butchers cutting meat.</td>
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<td>• Nurses lifting a patient.</td>
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<td>• Secretary typing on a computer.</td>
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<td>• Scientist pipetting.</td>
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Poor ergonomics can lead to injuries classified as musculoskeletal disorder, cumulative trauma injuries or repetitive trauma injuries.

There are various reasons why ergonomics has become commonly discussed in the workplace today. These include the promulgation/failed promulgation of regulatory standards, type of work (especially computers), and the availability of information on the subject. However, one reason that cannot be overlooked in the percentage of musculoskeletal injuries relative to all workplace injuries.
When reviewing your workstation and tasks, consider the common causes of injuries. In many cases, multiple causes may apply.
After considering the causes of injuries, consider the controls. The first is engineering controls, which focusses on having the correct equipment and assuring it is maintained and adjusted appropriately.

Engineering Controls

- Rearranging workstation/materials
- Modifying workstation/materials
- Redesign workstation/materials
- Utilizing tools or equipment
The second is administrative controls which focuses on the way we perform our work in order to reduce the stress placed on the body.

- Alternate heavy tasks with light tasks.
- Adjust work schedules, work pace, or work practices.
- Provide recovery time (e.g., short rest breaks).
- Modify work practices so that workers perform work within their power zone (i.e., above the knees, below the shoulders, and close to the body).
- Rotate workers through jobs that use different muscles, body parts, or postures.

* NIOSH Publication No. 2007-131
The third is work practice controls, specifically posture. While it may be easy to implement engineering and administrative controls, personal discipline is needed to implement and maintain proper posture. This is especially true for tasks performed over extended periods.
PROPER LIFTING
Correct Lifting

- Avoid lifting heavy or awkward objects.
- Face the object you are lifting.
- Keep your back straight and bend at your knees.
- Lift with your legs, not your back.
- Lift slow, especially if the task requires multiple lifts. (Avoid sudden jerks).
- Avoid twisting the body.
- Keep the object close to body.

While ideally one would want to limit the frequency, size, shape and distance (i.e. from the floor or overhead) of lifts, when there is a need, it is critical to follow the following steps:

- Avoid lifting heavy or awkward objects. Items without handles may result in one overcompensating, while large items may need to be broken down and or need equipment or additional staff to lift.
- Face the object you are lifting.
- Keep your back straight and bend at your knees.
- Lift with your legs, not your back. The back should remain straight.
- Lift slow, especially if the task requires multiple lifts. (Avoid sudden jerks).
- Avoid twisting the body.
- Keep the object close to body. This will provide the most control and place the least amount of stress on the body. In addition, it may reduce the risk of falls from improper balance.
Correct and incorrect lifting techniques. Note the position of the back.
WORKSTATION SETUP
There are a number of lab stools available. It is important that you review the manufacturers instructions for the proper positioning based on the type of work you are performing. In general, you want to minimize the bend in the back, neck and shoulders, minimize the direct contact between the lab bench and wrists and arms, and maintain the hands wrist and arms in a straight position parallel with the ground.
To avoid reaching, design your workstation so that items that are used frequently are close to you.
TASK SPECIFIC GUIDANCE
For computer workstations, assure

- That feet are flat on the floor.
- The chair height allows for roughly a 90-100 degree bend in the knees.
- The back is straight allowing a 90-120 degree bend at the hips.
  - Adjust lumbar support for comfort.
- Keyboard and mouse are close to the abdomen allowing a 90-100 degree bend in the elbows and arms close to the body.
- Hands, wrists and forearms are straight and parallel with the ground.
- Keyboard and monitor are directly in front of you.
- Monitor height is relatively even with your eyes.
For pipetting work, be sure to

- Select the right equipment. Consider the size, weight, type (i.e., electronic, light touch, etc.).
- Elevate chair or stand to assure the forearms, wrists, and hands are straight.
- Maintain the shoulders close to the body.
- Avoid twisting or rotating the wrists.
- Alternate hands.
- Use a relaxed grip.
- Apply little pressure/force.
For work involving tweezers and forceps, be sure to

• Find the tool that fits the size of your hand. In addition, look for the correct tool for the work you are performing.

• Properly grasp the tool. Be sure the tool is dry and that you have a controlled grip.

• Apply pressure at the wide section of the tool in order to assure the least amount of stress is placed on the fingers.

• Use the finger(s) instead of the finger tips.

• Avoid twisting or rotating the wrists.

• Alternate hands.
For work involving microscopes, be sure to

• Sit close to the work. This is very similar to the position of a computer workstation.

• Avoid sharp edges. Specifically be sure the edge of the counter is not creating contact stress with the forearms.

• Maintain the shoulders close to the body. Shoulders should be relaxed and not hunched.

• Adjust the chair to maintain an upright position. If possible, tilt chair or use a wedge.

• Adjust the eyepiece or mount the microscope to minimize the forward bend in the neck.
For work involving biosafety cabinets, be sure to

- Remove unnecessary materials while keeping materials in use fairly close.
  Reference back to the slide titled “lab bench”.

- Perform work roughly six inches inside biosafety cabinet.
  While items should be fairly close to the user, be sure the work is still well positioned in the cabinet to minimize the risk of exposure.

- Position supplies in order of use.

- Elevate chair or stand to assure forearms, wrists and hands are straight.
  Again, this position is similar to working with a computer or microscope.

- Maintain the shoulders close to the body.
REPORTING INJURIES
Many injuries are the result of cumulative or repetitive trauma. Working through pain or discomfort is not the answer. At the onset of symptoms, take action. Change or cease work, notify your supervisor, complete appropriate paperwork and if needed, work with your health care professional.
In the event there is an injury, be sure to complete the Accident/Incident Report Form. The forms should be completed as soon as possible with your Supervisor and sent to Risk Management Office.
As ergonomics has become a term that is more and more discussed in the workplace, available information has become more accessible.
We thank you for your time.
For additional questions or to request an ergonomic workstation evaluation, please contact Tufts Environmental Health and Safety.