


The three main risk factors (Static/Awkward Postures, Force, and Repetition) apply to every job in some capacity, including work performed in labs. Laboratory work and the design of typical workstations may pose various risks that can contribute to injury (MSD) development. This page examines some risks of common tasks and potential mitigations. Tips for certain tasks will apply to other work as well – be sure to review the page in its entirety.


It is recommended to explore the Ergonomics webpage for more general information on MSDs and risk factors. Review the Office Ergonomics resource page for information and tips on computer workstations.


Lab Bench Workstations

Risk Factor	Tips
Static Postures <ul style="list-style-type: none"> Working and remaining in one position/posture for a long time. 	<ul style="list-style-type: none"> Alternate between sitting and standing every ~30 minutes. When standing, wear comfortable footwear, use an anti-fatigue mat, or alternate propping up a foot on a small stool or box.
Awkward Postures <ul style="list-style-type: none"> Postures requiring the body or limbs to deviate from neutral positions, such as hunching, leaning, bending, reaching, or twisting. 	<ul style="list-style-type: none"> Ensure workbench has a cut out underneath so the user can sit or stand comfortably, with space for the legs or for a chair to slide under the counter. For example: 

	<ul style="list-style-type: none"> Adjust and arrange equipment in such a way that upright posture and minimal bending/leaning in the back or neck is required.
Awkward Postures, Force, Repetition <ul style="list-style-type: none"> Frequently reaching, twisting, or moving objects. 	<ul style="list-style-type: none"> Organize the workstation such that frequently used materials and equipment are positioned closer to the body, and less frequently used objects further away. Keep work in front of the body to minimize twisting and awkward reaching. Minimize obstructions to access equipment. Keep arms relaxed and elbows close to the body.
Lighting <ul style="list-style-type: none"> Poor lighting may cause eye strain or require the worker to lean in to view their work, or lift tasks closer to the eyes to see better. 	<ul style="list-style-type: none"> If ceiling lights are obstructed by shelving or otherwise inadequate, use task lights such as lamps or install under-counter lighting.

Fume Hoods and Biosafety Cabinets

Risk Factor	Tips
Postures  <p>The diagram shows a person in a white lab coat working at a biosafety cabinet. Ergonomic callouts include: '18-24" Viewing Distance' for the work area, 'Viewing Angle' indicated by a yellow cone, '90°' for the neck angle, 'Wrists Straight' for the forearm position, '90° Seat Back Angle' for the chair, 'Adjustable Seat Height 23" - 28" (584 - 711 mm)' for the chair, and 'Footrest for Proper Posture' for the footrest.</p>	<p><i>Ensure safe work practices are maintained while implementing ergonomic controls.</i></p> <ul style="list-style-type: none"> Where possible, keep materials closer to the body while still adequately ventilated by the hood/cabinet. Avoid resting the soft tissue of the forearm and wrists on the edge of the hood or cabinet to reduce compressive forces on vasculature and tendons. Where possible, rest the elbows, carpal bones, or lateral sides of the wrists (ulnar bones) on the surfaces instead. Attempt to keep arms relaxed and close to the body. Strive to reduce extension or flexion in the wrists. Take short breaks and stretches to relieve muscles.

	<ul style="list-style-type: none"> Utilize a cleaning device with a handle to clean when needed, rather than performing extending reaches:  <p style="text-align: center;">↓</p> 
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Pipetting, Fine Motor Skills / Micro-Manipulation

Risk Factor	Tips
Repetitive tasks, high forces in upper limb muscles.	<ul style="list-style-type: none"> Adjust the height of tasks or chair height to avoid working with elevated arms (aim to reduce tension in the shoulders and lifting the arms). Keep work in front of the body, elbows close to the sides, and neutral positions in the forearms and wrists with elbows at $\sim 90^\circ$. Maintain neutral, upright postures in the back and neck. Explore purchasing and using an electronic or latch-mode pipette instead of manual plunger-operated pipettes to reduce the need for excessive thumb force and repetition. Select tools with multi-finger controls when possible, thereby distributing loads among multiple digits. Rotate tasks if possible, to reduce length of time performing repetitive tasks. Take regular breaks and perform stretches.

	<ul style="list-style-type: none"> Practice using forceps between the 1st and 2nd digits instead of the 1st digit and thumb, or alternate these two methods. This assist in reducing repetitive tasks and forces on the thumb. Using pads (similar to grips on pencils/pens) on tools like forceps increases the equipment's surface area, therefore distributing forces more evenly and reducing forces acting on the digits.
Eye strain – focusing on task for long periods of time	<ul style="list-style-type: none"> Practice the 20-20-20 rule: Every 20 minutes, focus on an object 20 feet away for 20 seconds.

Bad posture**Seated posture:**

- Shoulders elevated
- Upper arm elevated
- Elbow extended

**Standing posture:**

- Upper back and neck stooped
- Lower back and trunk stooped
- Elbow flexed

**Wrist posture:**

- Wrist deviated

Good posture**Seated posture:**

- Lower back supported by chair
- Upper back and neck upright
- Elbow bent at 90°
- Wrist in the same plane as the forearm

**Standing posture:**

- Lower back and trunk upright
- Upper back and neck upright
- Upper arm vertical
- Elbow bent at 90°

**Wrist posture:**

- Forearm parallel to the floor
- Wrist and forearm in the same plane

Microscopes

Risk Factors	Tips
Postures – Static or Awkward	<ul style="list-style-type: none"> Move the microscope closer to the edge of the workstation when in use and strive to reduce leaning or bending in the neck and back. Adjust the height of the microscope to help maintain an upright posture. Set equipment on a box or stand to raise it higher.

	<ul style="list-style-type: none">• Utilize video display/television systems to eliminate the use of binocular eyepieces.
Eye strain – focusing on task for long periods of time	<ul style="list-style-type: none">• Practice the 20-20-20 rule: Every 20 minutes, focus on an object 20 feet away for 20 seconds.

Laboratory Chair Recommendations

When looking at chair options, look for chairs with the following components:

- Stool seat that swivels easily
- 5-leg base with casters
- Seat height, depth, and pan angle adjustments
- Backrest and adequate lumbar support
- Armrests (preferably height-adjustable)
- Foot rest/ring
- Appropriate fabric for the lab (non-porous, anti-microbial, easy to clean)