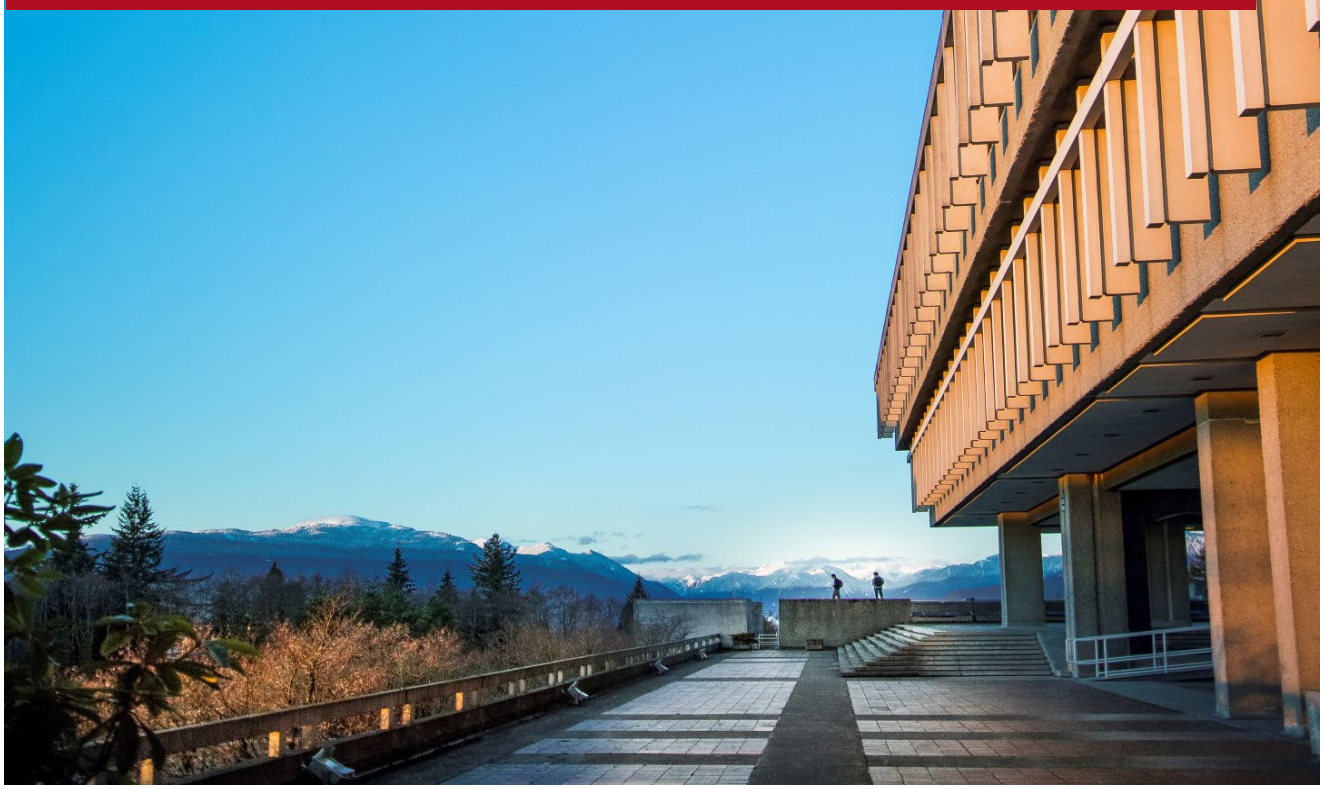
2023

Lab Ergonomics Guide

Environmental Health & Safety



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This guide is maintained by the Ergonomics Program Manager.
Contact ergosafe@sfu.ca with any questions.

Introduction

SFU is committed to providing a healthy and safe learning, teaching, research, and work environment for all members of the university community. Ergonomics-related incidents leading to musculoskeletal injury are consistently among the top three incident types each year and often result in lost time.

This guide is a component of the SFU Ergonomics Program which aims to reduce musculoskeletal injuries (MSI). This guide was developed to inform employees about signs and symptoms of prevalent MSIs among lab personnel, ergonomics risk factors typically found in laboratory settings, best practices to reduce injury risk, common risk controls, and bring awareness to SFU ergonomics resources. It is recommended that new lab employees review this guide as a part of their safety orientation. Please note that this guide does not supersede established lab procedures.

Musculoskeletal Injury

Injury occurs when the demands of a task exceed the capability of the person performing it. Injury can be caused or aggravated by activities both at and outside of work. By using ergonomics to fit the job to the employee, work-related injuries can be prevented and the severity reduced. Musculoskeletal injury is the most common injury arising from exposure to ergonomics risk factors.

MSI are injuries caused by overuse of structures of the musculoskeletal systems such as bones, muscles, joints of the neck, shoulders, arms, wrists, legs and back, tendons, ligaments, soft tissues, blood vessels and nerves; either through a single forceful exertion or repeated use of the same joint.

Being able to recognize signs and symptoms early and seeking help can improve MSI treatment outcomes. These signs and symptoms can appear suddenly from an acute exposure or gradually from a long term/repeated exposure. The chart below is a non-exhaustive list of MSI signs and symptoms.

Signs (can be observed)	**Symptoms** (can be felt)
Redness Swelling Reduced range of motion or moving a particular body part	Numbness/tingling/burning sensation/heat Pain and/or localized discomfort Joint/muscle stiffness Muscle weakness Tender to touch

Ergonomics Risk Factors

Ergonomics risk factors are conditions that pose stress to the human body and can contribute to the development of musculoskeletal injuries. See the chart below for descriptions of common ergonomics risk factors in SFU workplaces.

Risk Factor	**Description**
Force	Exerting muscular effort on an object as part of a task. Typically arising during manual materials handling tasks that involve lifting, lowering, carrying, pushing or

	pulling. Also includes gripping forces required to manipulate laboratory tools such as: • pinch grip (item held between the thumb and index finger) • power grip (hand wrapped around the handle) A power grip is good for tasks with high force. A pinch grip gives better precision but the forces in the muscles and bones are much higher. This can increase fatigue and the risk of developing MSI in pinch grips.
Posture	The position of the body and it's joints **Awkward posture**: An awkward posture is one where the joint outside of a comfortable range of motion and is weaker or more likely to fatigue or become injured. Some positions of a joint are stronger and healthier than others. These are sometimes called neutral postures. **Sustained posture**: Holding the body, or a body part, in the same position for an extended period of time.
Repetition	Performing a task that uses the same muscles over and over with little chance for rest or recovery. A task that is completed more than once every 30 seconds is considered a highly repetitive task.
Contact Stress	Contact stress happens when some part of the body—knees, elbows, wrists or fingers, for example—touches or rubs up against a hard, sharp or inflexible surface repetitively or for an extended period of time.
Vibration	Exposure to vibration may lead to Hand-Arm Vibration Syndrome, a set of upper extremity disorders that include vascular, sensorineural, and musculoskeletal signs and symptoms. Vibration-induced health effects could occur both with acute exposures and chronic exposures over time. Some of the signs and symptoms of vibration exposures are tingling, numbness, pain, and reduced sensory perception and dexterity in the hand. Occupational vibration exposure typically arises from power tool use.
Task Duration	The length of time work is being performed. The longer the exposure to risk factors, the higher likelihood of developing an injury.

Lab Ergonomics

The nature of lab work and the design of the workstations have many ergonomics risk factors which can contribute to MSI development. Repetitive movements (keyboard and mouse work, pipetting, opening/closing tubes), prolonged stationary postures (sitting, standing or unsupported arms), awkward postures (extended reaches), and contact stress (soft tissues coming in contact with hard surfaces) are

all common ergonomics risk factors. Risk controls aim to limit exposure to these risk factors through modifying workstation and equipment set up and implementing administrative controls.

Researchers may use computers to conduct data entry or perform analysis and research work. Where possible, write-up stations should be located adjacent to but outside the lab so people are not encumbered with PPE such as safety glasses, gloves, lab coats as they work at the computer. Potential risk factors associated with computer work are listed below but it is recommended all members review EHS office ergonomics resources and training module.

There is potential for more physically demanding manual materials handling tasks to occur in field research activities. It is recommended that those who participate in such activities review the Field Research Ergonomics resource document found on the EHS manual materials handling webpage. Some examples of manual materials handling tasks within the lab include: pouring solutions, lifting carboys, or transporting chemicals by carrying or via a cart. Potential risk factors associated with lab manual materials handling is listed below.

Prevalent MSIs

The following MSIs are common among lab workers:

- Carpal tunnel syndrome
    - A condition where the median nerve is squeezed or compressed as it travels through the wrist
- Tendonitis in upper limb
    - Inflammation of the tendon
        - E.g. Rotator Cuff Tendonitis, Lateral Epicondylitis (tennis elbow), Medial Epicondylitis (golfer's elbow)
- Tenosynovitis in upper limb
    - Inflammation of the sheath that encloses tendons
        - E.g. De Quervain's Tenosynovitis is tendon sheath swelling in muscles that move the thumb
- Back strain
- Neck strain

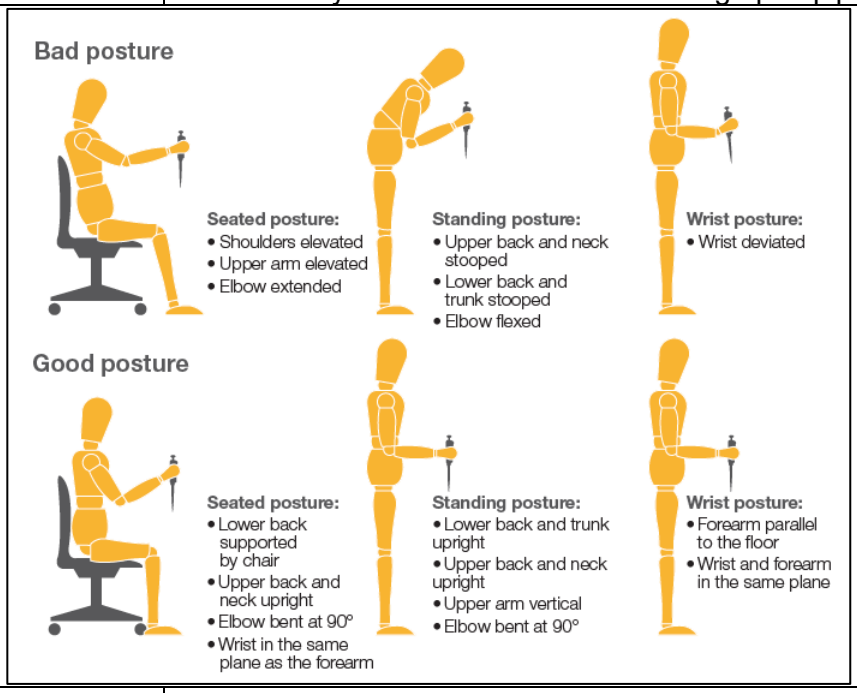
Employees who are experiencing MSI symptoms at work or believe they have developed an MSI should advise their supervisor, seek medical treatment, and submit an incident report.

Ergonomics Risk Factors in Common Lab Tasks

The following sections outline ergonomics risk factors associated with common lab tasks such as: pipetting, microscopy, use of biosafety cabinets and fumehoods, computer work, and manual materials handling (lifting/lowering/carrying). Tips to reduce exposure to the risk factor are also provided.

Pipetting

Ergonomics Risk Factor	Tips
Repetition	• Use latch-mode or electronic pipettes for repetitive pipetting • Take a 1 to 2-minute break after every 20 minutes of pipetting • Alternate or use both hands to pipette

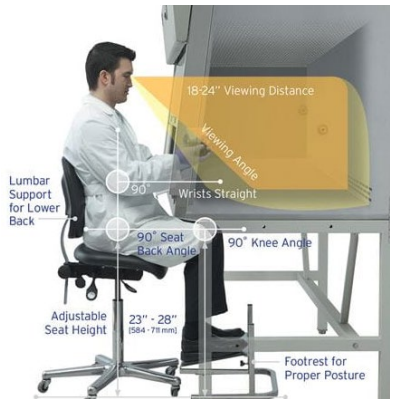
Posture (awkward) – upper limb and body	**Extended reaches caused by workstation set up**: • Work supplies such as trays and beakers should be placed within easy reach and with no obstructions to their access. Keep work in front of the body to minimize twisting and awkward reaching. • Use low profile tubes, containers, and receptacles to avoid bending and twisting of the wrists, neck, and rolled shoulders **Wrist posture** • Strive for straight and neutral wrist position while working. • Do not twist or rotate your wrist while pipetting. **Upper limb/body posture** • Avoid working with winged elbows/arms. • Keep arms relaxed and elbows close to the body. • Keep head and shoulders in an upright, neutral position
Posture (sustained) – sitting or standing	• Sit supported against the backrest of your chair. • Sit or stand close to your work at bench cut outs. • Adjust your chair to work height rather than bending your neck down when working. • Elevate your chair rather than reaching up to pipette.
	
Force – gripping	**Applying force** • Use minimal pressure while pipetting. • Use light force or two hands to change tips. **Equipment selection** • Use low profile tubes, solution containers and waste receptacles. • Select a light-weight pipetter sized for your hand. • Use pipetters with finger aspirators and thumb dispensers to reduce thumb strain. • Where possible, use electronic, light-touch, or latch mode pipettes for intensive pipetting. Multiple finger (as opposed to thumb-only)

	pipette designs are preferred. Use the lightest touch possible while pipetting and changing tips.

Microscopy

Ergonomics Risk Factor	Tips
Posture – upper body	• Raise, incline or reposition microscopes as close to the head as possible to allow the head to be held in an upright position. Avoid bending at the neck. • Use longer ocular tubes (eye pieces) to avoid neck strain. • Where appropriate, use video display screens to eliminate the use of a binocular system • If standing, raise microscope so that the eye piece is at eye level and use an anti-fatigue mat.
Posture – upper limb	• Arms should be supported and relaxed while using the microscope with the elbows close to the sides. • Wrists should be in a neutral position while making adjustments.
Eye Strain	• Keep all optical components scratch-free and clean. • Align the illumination correctly and use the correct light density. • Exercise the eyes – change focus by momentarily looking at something farther away and periodically shut and open eyes.
Contact Stress	• Avoid leaning on hard edges. • Pad forearms and edges.
Task Duration	• Spread microscope work throughout the day and share it with several people, if possible. • Take short breaks. Every 15 minutes, close the eyes or focus on something in the distance. Every 30-60 minutes, get up to stretch and move.

Fume Hoods & Biosafety Cabinets

Ergonomics Risk Factor	Tips
Posture 	*Always follow the safe work guideline for work in BSC and Fume Hood* • Keep arms relaxed and by the sides. Back, shoulders and neck should be upright and neutral in position. • Adjust chair/stool to a height that allows the shoulders to relax. Sit with armpits level with the bottom of the sash. • Keep the sash clean and free of glare so that you can see without tilting your neck or assuming an awkward position. Use diffused lighting to limit glare. • Use low profile tubes, containers, and receptacles to avoid bending and twisting of the wrists, neck, and rolled shoulders • Strive to keep wrists straight and neutral while working. • Keep the work area clean and free of clutter. Remove unnecessary supplies. • Set up the work station in the hood to avoid extended reaches. • Place equipment on approved elevated turntables for easy retrieval. • Take short breaks to stretch muscles and relieve forearm and wrist pressure.

	• When cleaning the biosafety cabinet, eliminate extended reaches by using a Swiffer or other long handled-cleaning device dedicated for this purpose.  → 

Computer/Laptop Work in Labs

Ergonomics Risk Factor	Tips
Posture & contact stress – set up of computer workstation Improper workstation set up has potential to cause awkward postures of the neck, upper limb, and trunk and contact stress to the legs and wrists.	• Adjust (raise) chair/stool to ensure neutral upper limb postures while typing. • Use footrest to ensure foot support. • Ensure three fingers of space between edge of chair and back of leg to avoid contact stress. • Place keyboard and mouse directly in front of the body. • Avoid positive tilt of the keyboard (flip feet down). • Do not rest wrists on edge of desk while typing. • Adjust monitor to ensure eye-level is in top third of screen.
Repetition – typing and mousing	• Take frequent microbreaks (30 seconds to 2 minutes).
Posture – working from a laptop The built-in keyboard and trackpad mouse create awkward postures of the upper back, wrists, and neck.	• Use an external keyboard and mouse. • When using an external keyboard and mouse, the laptop can be raised to the appropriate height (using a riser or stack of books) and used only as a screen. This set up puts the body in a neutral and more comfortable working posture. • Use a docking station for laptop.
Duration	• Avoid sustained postures by rotating between sitting and standing computer work.

Manual Materials Handling in Labs

Ergonomics Risk Factor	Tips
Force – lifting, handling, carrying objects (e.g. chemical bottles, tools, equipment)	• Use mechanical lifting devices and carts for heavier lifting and transporting. • Use siphon systems and automatic tipping mechanisms instead of moving containers of liquid. • Store frequently used products in smaller containers of manageable weight and size. • Use bottle dispensers and bottom dispensing carboys for dispensing liquids.

	• Use the WorkSafeBC Lift/Lower Calculator to determine if the lift requires additional controls to reduce risk of injury: http://worksafebcmedia.com/misc/calculator/llc/
Posture – back and limbs Lifting objects from the floor or overhead create awkward postures of the back and shoulders, respectively. Large and bulky objects can require awkward upper limb postures to maintain a good grip.	• Store heavy and/or frequently used items on shelves at waist height. • Seek assistance for large/bulky objects and perform team lifts.
Duration	• Consider submitting a Facilities Services Move Request when a large amount of manual materials handling is required.

General Tips for Reducing Risk

Equipment Selection and Use

- ✓ Provide ergonomic microscopes and pipettes.
- ✓ Make sure all equipment is clean and in good working order to help minimize repetitive or forceful twisting, turning, and pinching. Equipment should be the right size for your hand.
- ✓ Use the lightest pressure possible to use your equipment (e.g. pipettes).
- ✓ Use electronic, automated, or light touch model equipment when possible.
- ✓ Provide handling devices to move and lift full carboys (containers).

Taking Breaks to Reduce Exposure

- ✓ Rotating personnel among different tasks to rest the various muscle groups of the body and reduce repetition or minimize the amount of time spent performing certain tasks.
- ✓ Intensive tasks should be spread through the day or shared between lab members when possible.
- ✓ Take frequent rest breaks and microbreaks (30 seconds to 2 minutes every 30 minutes).

Workstation Design and Set-up

- ✓ Use padding and/or tubing on equipment and work area edges to reduce pressure and force while working.
- ✓ Separate supports may be needed for the arms when working with microscopes.
- ✓ Provide adjustable work stations that have sufficient room for the legs. Ensure that the knees do not hit the laboratory bench.
- ✓ If possible, adjust the position of your work, your work surface, or your chair or stool so that you can work effectively while maintaining an upright, supported position. Avoid hunching over your work.
    - For precision work, the work surface can be adjusted higher to provide support and reduce bending and hunching.
    - Regular light work generally places the work surface around elbow height or just below.
    - Heavy work places the work surface approximately six inches below elbow height.
- ✓ Try to work at a bench cut out or a fume hood/biosafety cabinet with adequate knee clearance. If you are seated, you need room for your legs. If you are standing, a foot rail or foot prop is

recommended to encourage and aid shifting positions throughout the work day. Propping a foot up relieves pressure on the back.
- ✓ Provide supportive comfortable chairs that include foot rests, and ensure that there is knee clearance under the lab table.
- ✓ Provide anti-fatigue mats for standing workstations.

Work Practices

- ✓ If you stand at your workstation, wear comfortable shoes. If you are seated, an adjustable chair or stool is recommended. Sit against the back of your chair. If your feet come off the ground, lower the chair, adjust the foot ring, or get a footrest.
- ✓ Keep frequently used items within close reach. Most frequently used items should be at approximately a forearm's reach away, with lesser-used items up to arm's reach away. Items you are currently working with should be directly in front of the body.
- ✓ Keep shoulders, arms and hands relaxed and elbows close to the sides while working.
- ✓ Try to keep the wrists neutral and aligned while working. Sitting close to your work will help with this.
- ✓ Alternate your grip on items like forceps.

Resources

Lab Ergonomics Checklist

It is recommended that supervisors and/or safety committee members use the Lab Ergonomics Checklist to identify and control ergonomics risk factors present in a lab. See Appendix A for the checklist.

Incident/Hazard Reporting

Immediately report a work-related musculoskeletal injury to your supervisor. Within 24 hours, submit an incident report to notify the EHS department, who will investigate. The online incident reporting system is available at: http://www.sfu.ca/srs/report.

Campus Public Safety provides first aid treatment for minor injuries. Call CPS at 778.782.4500 or visit the first aid room in the Safety & Risk Services office in Discovery 1.

Report all ergonomics-related hazards and/or risk factors to your supervisor who is responsible for investigating and initiating appropriate action. If your supervisor fails to address your perceived hazard, contact your local joint safety committee or the Ergonomics Program Manager at ergosafe@sfu.ca.

Ergonomics Assessments

EHS offers individual ergonomics assessments to all SFU employees in all SFU work environments. Most assessments are in-person. Virtual assessments of secondary work locations can be conducted via MS Teams or Zoom. The steps below outline the process for requesting an ergonomics assessment from EHS. Take these steps before you make changes to your workstation or purchase any equipment or products.

Step 1 – Speak to your supervisor. Let your supervisor know as soon as possible if you are experiencing discomfort or have concerns. They will conduct an assessment and may be able to

discuss options (i.e. alternative chairs or equipment, task design) that are available within the department.

Step 2 – Complete the appropriate checklist.

- For assessment of a shared computer workstations: **Office Ergonomics Self-Assessment Checklist**.
- For assessment of a manual materials handling task: **WorkSafeBC MSI Risk Assessment Worksheet**.
- For assessment of a laboratory tasks: **Lab Ergonomics Checklist** (adapted from UC Davis) (see Appendix A).
    - If the task is not covered in the checklist, please email a detailed description of the task to ergosafe@sfu.ca.

Step 3 – Submit the Ergonomics Assessment Request Form on the SFU Ergonomics Webpage.

- Attach the completed checklist and pictures (for virtual assessments). Your request will be responded to in 3 business days.

Furniture Consultation

PIs or Lab Managers seeking guidance on ergonomic lab seating may send their selections to ergosafe@sfu.ca for feedback. Lab stools, at a minimum, should have the following specifications:

- A stool seat that swivels easily
- A five-leg base with casters
- Adjustment controls for the following:
    - Seat height
    - Seat depth
    - Seat pan angle
- A backrest that provides adequate lumbar support
- Armrests that are easily attachable/removable and height adjustable
- No sharp or rough edges on the stool, armrests, or controls
- A weight capacity of at least 250 lbs
- The appropriate fabric for the lab (e.g. non-porous, anti-microbial, anti-bacterial, easy to clean etc.)
- Usage instructions are readily available and provided to end user
- Label on chair with manufacturer name, product name, model number, manufacturer/vendor contact information and other information necessary to allow for service and warranty

Office chairs can be tested out in the EHS department by appointment. Click here for more information about office chair adjustability guidelines and demos: https://www.sfu.ca/srs/work-research-safety/general-safety/ergonomics/purchasing-furniture.html

Webpage

The Ergonomics webpage on the Safety and Risk Services website is where the most up to date information can be found: https://www.sfu.ca/srs/work-research-safety/general-safety/ergonomics/

Check out the website to:

- View the SFU Ergonomics Program Manual and resource documents
- Request an ergonomics assessment
- Enroll in ergonomics training
- Contact ergosafe@sfu.ca with any questions

SFU SAFETY & RISK SERVICES
ENVIRONMENTAL HEALTH & SAFETY

Lab Ergonomics Checklist

Lab:	Location:	Date of completion:
Checklist completed by:		
Relevant Findings/Comments:		

Employee education is essential for prevention of injuries in the lab. From the Lab Ergonomics Guide, employees should have a basic understanding of ergonomic principles and be able to recognize ergonomics risk factors and musculoskeletal injury (MSI) symptoms. The design of the job itself (work/rest schedules, job rotation), work tools and the workstation dimension/layout also have a direct impact on the risk of injury. Incorporating ergonomic principles into the design of lab tools and workstations and reviewing work processes to maximize efficiencies can help prevent MSI. Periodic review of the work environment, tools and procedures helps to assure that necessary modifications are made as processes change.

This checklist will help identify ergonomics risk factors associated with lab environments and tasks. Designed for use by lab supervisors and employees, safety committee members, and EHS, the checklist also includes information to help eliminate or reduce identified risks.

How to Use the Checklist

1. See if the following information if available for the lab:
    a. A list of musculoskeletal injuries; and
    b. Employee complaints or concerns about performing specific tasks.
2. Contact the lab employees and their supervisor and discuss the purpose for performing the ergonomic survey. Ask the supervisors and workers if there are any issues or concerns that they have regarding lab work tasks.
3. Complete the Lab Ergonomics Checklist for the tasks being completed in the lab. Answer N/A if the question does not apply to the task. Include all meaningful comments for each area.
4. Each “NO” answer indicates a risk of injury or sub-optimal condition. For each “NO” answer, consider changes or modifications to the workstation or task to result in a yes response. When considering changes, obtain input from the workers, supervisors, and other safety specialists if available. Whenever possible, evaluate equipment before making purchases and before modifying the work areas or tasks. This process will help increase product acceptance, test product usability, and durability, and take advantage of worker experience.

Please send the completed checklist and any questions about ergonomics to ergosafe@sfu.ca.

This checklist was developed by UC Davis and adapted for use at SFU.

		Yes	No	Change/Modification	Comments
Lab Workstation Design					
	Standing & Seated Bench				
1	Is the height of the bench appropriate for the work performed? a. Work can be positioned close to elbow height (~ 36-40") b. Work can be performed with shoulders relaxed	☐	☐	☐Adjustable height benches ☐Adjustable lab stool/chair ☐Temporary standing platforms ☐Move the task to a seated bench with adjustable chair	
2	Are primary work tools and supplies located within arm's reach (4-18") from bench edge?	☐	☐	☐Reposition tools and supplies within 18" distance ☐Provide tool organizers, turntable workstations, turntables, storage bins, pipette holders and carousels	
3	Is there knee and foot clearance when completing standing tasks in front of the bench? a. 4" deep knee clearance b. 4" high and 4" deep foot clearance	☐	☐	☐Work at open bench cut outs ☐Remove supplies and equipment from bench cut out areas ☐Modify bench surface with clamp on cut out extensions to increase knee and foot clearance	
4	Is a foot rail or prop available (6" from floor)	☐	☐	☐Install rails or foot props ☐Use footrest ☐If bench has undersurface cabinet, open or remove door and place foot on lower shelf	
5	Are there anti-fatigue mats in areas where prolonged standing tasks are completed?	☐	☐	☐Provide anti-fatigue mats ☐Use cushioned shoes and in-soles	
6	Does the bench have rounded or padded edges to reduce contact stress?	☐	☐	☐Add edge rests and protectors to eliminate sharp edges ☐Use gel pads on surface to protect elbows ☐Wear custom padded sleeves under lab coat	
7	Is standing bench available for tasks requiring frequent movement between workstations?	☐	☐	☐Redesign work to reduce movement between stations to optimize workflow	
8	Is seated bench available for tasks requiring precision and close inspection?	☐	☐	☐Provide arm supports for stability if not available	

Checklist developed by UC Davis and adapted for use at SFU.

		Yes	No	Change/Modification	Comments
				☐Provide sit-stand stools ☐Provide adjustable work platforms to position work at optimal height	
9	Are bench cut-outs available for seated workers to ensure adequate knee/foot clearance?	☐	☐	☐Redesign benches to provide cut-outs for seated work ☐Provide sit-stand chairs to improve knee clearance when working ☐Clear out cut-outs if cluttered with supplies or equipment	
	Lab Stools/Chairs				
11	Can the lab chairs be adjusted to accommodate all workers? a. Seat height appropriate for work at height of benches? b. Feet supported on floor, ring or footrest?	☐	☐	☐Provide chairs with adjustable height and depth seats and backrests ☐Provide chairs with foot rings or provide footrests	
12	Are armrests adjustable or removable if they interfere with work?	☐	☐	☐Adjust armrests to provide support with shoulders in neutral postures ☐Remove armrests	
13	Are appropriate footrests or foot rings provided?	☐	☐	☐Provide industrial footrest ☐Install foot ring on chair ☐Install rail or platform	
14	Do employees know how to adjust chairs to suit their stature?	☐	☐	☐Train employees on how to adjust chair	

		Yes	No	Change/Modification	Comments
Lab Tasks					
	Microscopes				
15	Can employees view the eyepiece with neutral neck, shoulder and back postures? (Neck flexion < 25°, shoulders relaxed, back upright and supported by chair)	☐	☐	☐Reposition microscope ☐Adjust height ☐Adjust angle ☐Reposition worker ☐Adjust posture ☐Adjust seat height ☐Adjust seat angle	
16	Is the microscope positioned within easy reach of the worker? (Generally close to the edge of the workbench)	☐	☐	☐Reposition microscope ☐Move closer to front of counter	

		Yes	No	Change/Modification	Comments
				☐Reposition worker ☐Adjust posture ☐Sit closer to bench	
17	Can the microscope be positioned to promote neutral head, neck, shoulders and arm postures when used?	☐	☐	☐Reposition microscope ☐Use microscope adapters ☐Positioning plate ☐Ergo adapter ☐Scopease ☐Optical wedge ☐Extended eye tube ☐Eyepiece adapter ☐Use video system	
18	Are arms supported by worksurface, chair armrests, or pads for prolonged work?	☐	☐	☐Use arm supports ☐Use pads ☐Adjust armrests ☐Adjust worker position	
19	Can the worker use the microscope controls with arms supported and relaxed?	☐	☐	☐Reposition microscope ☐Use microscope adapters ☐Use arm supports/pads ☐Adjust armrests ☐Adjust worker position	
20	Are microscope work breaks provided?	☐	☐	☐Institute work rotation ☐Institute work breaks ☐Reduce eye strain using 20/20/20 rule (every 20 min. look 20 feet away for 20 sec.)	
	Pipettes				
21	Is manual pipette use limited to less than 4 hours per day?	☐	☐	☐Institute work rotation ☐Institute work breaks ☐Consider use of alternative pipettes	
22	If pipette use is more than 4 hours per day, are multi-channel, electronic or latch mode pipettes available?	☐	☐	☐Evaluate use of alternative pipettes ☐Electronic ☐Latch-mode ☐Multi-channel	

		Yes	No	Change/Modification	Comments
23	Have employees been trained to select appropriate pipettes for pipetting task?	☐	☐	☐Employee training	
24	Are racks, trays, beakers and supplies available and placed within easy reach?	☐	☐	☐Provide racks and trays ☐Position supplies within close reach ☐Use pipette racks and organizers	
25	Are vials, tubes and receptacles as low profile as possible?	☐	☐	☐Provide short beakers and vials ☐Provide short tips and tubes ☐Provide short/angled waste receptacles	
26	Do workers pipette with shoulders relaxed, and arms and wrists in neutral postures?	☐	☐	☐Employee posture training ☐Adjust work position ☐Adjust workstation set-up	
	Micromanipulation				
27	If forceps are used for prolonged periods, are locking mechanisms, O-rings or other adapted aides used to reduce prolonged or static pinch forces?	☐	☐	☐Provide adapted tweezers/forceps ☐O-rings ☐Pads/foam grips ☐Self-closing ☐Low force tools ☐Alternate fingers/hands	
28	Are vials easy to cap and thread?	☐	☐	☐Provide easy opening caps ☐Provide vials with minimal number of threads	
29	Are cap openers available?	☐	☐	☐Provide decapping tools	
30	Are clamps and holders available to support test tubes and other materials that must be help for prolonged periods?	☐	☐	☐Provide vial clamps ☐Provide racks, holders, shelves, or organizers	
	Microtome/Cryostat				
31	Can workers operate the microtome with hands in a pistol grip position? (Wrist aligned with forearm and in handshake position)	☐	☐	☐Re-position worker ☐Re-position height, angle or position of microtome ☐Employee training in work postures ☐Use foot operated controls ☐Modify handle position	
32	Do employees have access to a motorized microtome/cryostat for high intensity/ volume work?	☐	☐	☐Consider electronic cryostat for high volume workloads	

		Yes	No	Change/Modification	Comments
	Laboratory Hoods and Biosafety Cabinets				
33	Is leg, knee clearance available to promote neutral sitting postures when using the hood or cabinet?	☐	☐	☐Clear knee area under cabinet or hood ☐Use sit/stand stool	
34	Can workers work with shoulders relaxed when sitting or standing?	☐	☐	☐Consider height adjustable hood or cabinet ☐Use height adjustable stool/chair	
35	Are materials inside the hoods and cabinets as close as possible to the worker to avoid over-reaching?	☐	☐	☐Position receptacles within close reach ☐Use turntables, rotating organizers, angled platforms	
36	Are vials, tubes and receptacles as low profile as possible?	☐	☐	☐Provide low profile vials, tubes and receptacles ☐Angle receptacles to position within closer reach	

		Yes	No	Change/Modification	Comments
Miscellaneous					
37	Are bottle dispensers and bottom dispensing carboys available to dispense liquids?	☐	☐	☐Provide bottle dispensers ☐Provide bottom dispensing carboys ☐Provide bottles with handles	
38	Is there adequate and appropriate storage for supplies? a. Is sufficient space available for supplies? b. Are heavy bottles and boxes stored on low shelves?	☐	☐	☐Provide storage for supplies ☐Place heavy items on shelves between knees and chest level	
39	Are jars easy to open or are jar openers available?	☐	☐	☐Provide jar openers	
40	Are temporary platforms available for tasks that require elevating arms above chest level for prolonged periods?	☐	☐	☐Consider standing platforms or elevated work areas (Consider safety issues and reduce fall risks before using)	
41	Are there adequate bins and racks for frequently used items?	☐	☐	☐Provide bins, racks and shelves for frequently used items	
42	Have all lab members reviewed the SFU Lab Ergo Guide?	☐	☐	☐Provide link to guide: https://www.sfu.ca/srs/work-research-safety/general-safety/ergonomics/Lab-Ergonomics.html	