

Reducing Ergonomic Risks in Laboratories

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

Laboratory Checklist

This document will help you identify risk factors associated with laboratory environments. Designed for use by both safety specialists and laboratory workers, the checklist also includes information to help eliminate or reduce identified risks.

How to Use the Checklist

Step One: If you work with a safety specialist or safety committee, see if the following information is available for your laboratory: (1) list of musculoskeletal injuries; and (2) worker complaints or concerns about performing specific tasks.


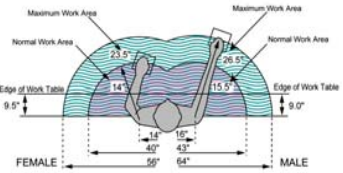

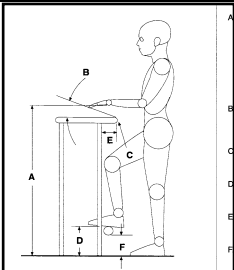

Step Two: Contact the workers and supervisor and discuss the purpose for performing the ergonomic survey. Ask the supervisors and workers if there are any issues or concerns that they have regarding laboratory work tasks.




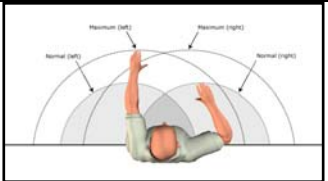

Step Three: Complete the Laboratory Checklist for the tasks being completed in the laboratory. Answer N/A if the question does not apply to the task.





Include all meaningful comments for each area.






Step Four: *Each "NO" answer indicates a risk of injury or sub-optimal condition. For each "NO" answer, concerning 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.*






Laboratory Ergonomics Checklist

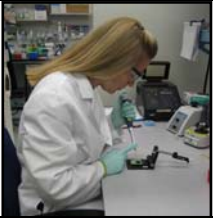





		Yes	No	Change/Modification	Comments
Standing Bench					
	<p>1. Is the height of the bench appropriate for the work performed?</p> <p>a. Work can be positioned close to elbow height (~ 36-40")</p> <p>b. Work can be performed with shoulders relaxed</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Adjustable height benches <input type="checkbox"/> Adjustable chair <input type="checkbox"/> Temporary standing platforms <input type="checkbox"/> Move the task to a seated bench with adjustable chair	
	<p>2. Are primary work tools and supplies located within arm's reach (4-18") from table edge?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Reposition tools and supplies within 18" distance <input type="checkbox"/> Provide tool organizers, turntable workstations, turntables, storage bins, pipette holders and carousels	
	<p>3. Is there knee and foot clearance when completing standing tasks in front of the bench?</p> <p>a. 4" deep knee clearance</p> <p>b. 4" high and 4" deep foot clearance</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Work at open bench cut outs <input type="checkbox"/> Remove supplies and equipment from bench cut out areas <input type="checkbox"/> Modify bench surface with clamp on cut out extensions to increase knee and foot clearance	
	<p>4. Is a foot rail or prop available (6" from floor)</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Install rails or foot props <input type="checkbox"/> Use footrest <input type="checkbox"/> If bench has undersurface cabinet, open or remove door and place foot on lower shelf	
	<p>5. Are there floor mats in areas where prolonged standing tasks are completed?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Provide floor mats <input type="checkbox"/> Use cushioned shoes and in-soles	




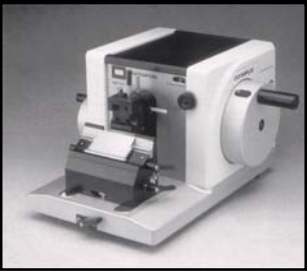
		Yes	No	Change/Modification	Comments
	6. Does the bench have rounded or padded edges to reduce contact stress?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Add edge rests and protectors to eliminate sharp edges <input type="checkbox"/> Use gel pads on surface to protect elbows <input type="checkbox"/> Wear custom padded sleeves under lab coat	
	7. Is standing bench available for tasks requiring frequent movement between workstations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Redesign work to reduce movement between stations to optimize workflow	
Seated Bench					
	8. Are bench cutouts available for seated workers? a. Minimum 15" depth b. Minimum 20" width	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Redesign benches to provide cutouts for seated work <input type="checkbox"/> Provide sit-stand chairs to improve knee clearance when working <input type="checkbox"/> Clear out cutouts if cluttered with supplies or equipment	
	9. Are work items within close reach? a. Maximum 24"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Reposition tools and supplies within 24" distance <input type="checkbox"/> Provide tool organizers, turntable workstations, turntables, storage bins, pipette holders and carousels	
	10. Is seated bench available for tasks requiring precision and close inspection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Provide arm supports for stability if not available <input type="checkbox"/> Provide sit-stand stools <input type="checkbox"/> Provide adjustable work platforms to position work at optimal height	
Laboratory Chairs					



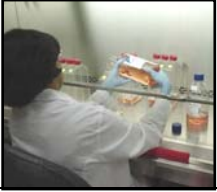

		Yes	No	Change/Modification	Comments
	11. Can the laboratory chairs be adjusted to accommodate all workers? a. Seat height appropriate for work at height of benches? b. Feet supported on floor, ring or footrest?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Provide chairs with adjustable height and angle seats and backrests <input type="checkbox"/> Provide chairs with foot rings <input type="checkbox"/> Provide footrests	
	12. Are armrests adjustable or removable if they interfere with work?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Adjust armrests to provide support with shoulders in neutral postures <input type="checkbox"/> Remove armrests	
	13. Are appropriate footrests or footrings provided?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Provide industrial footrest <input type="checkbox"/> Install foot ring on chair <input type="checkbox"/> Install rail or platform	
	14. Do employees know how to adjust chairs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Train employees to adjust chair	
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?)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Reposition microscope <ul style="list-style-type: none"> <input type="checkbox"/> Adjust height <input type="checkbox"/> Adjust angle <input type="checkbox"/> Reposition worker <ul style="list-style-type: none"> <input type="checkbox"/> Adjust posture <input type="checkbox"/> Adjust seat height <input type="checkbox"/> Adjust seat angle <input type="checkbox"/> use arm support/pad	


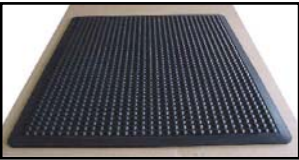


		Yes	No	Change/Modification	Comments
	16. Is the microscope positioned within easy reach of the worker? (Generally close to the edge of the workbench)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Reposition microscope <input type="checkbox"/> Move closer to front of counter <input type="checkbox"/> Reposition worker <input type="checkbox"/> Adjust posture <input type="checkbox"/> Sit closer to bench	
	17. Can the microscope be positioned to promote neutral head, neck, shoulders and arm postures when used?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Reposition microscope <input type="checkbox"/> Use microscope adapters <input type="checkbox"/> Positioning plate <input type="checkbox"/> Ergo adapter <input type="checkbox"/> Scopease <input type="checkbox"/> Optical wedge <input type="checkbox"/> Extended eyetube <input type="checkbox"/> Eyepiece adapter <input type="checkbox"/> Use video system	
	18. Are arms supported by worksurface, chair armrests, or pads for prolonged work?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Use arm supports <input type="checkbox"/> Use pads <input type="checkbox"/> Adjust armrests <input type="checkbox"/> Adjust worker position	
	19. Can the worker use the microscope controls with arms supported and relaxed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Reposition microscope <input type="checkbox"/> Use microscope adapters <input type="checkbox"/> Use arm supports/pads <input type="checkbox"/> Adjust armrests <input type="checkbox"/> Adjust worker position	
	20. Is there sufficient legroom and foot support when using the microscope?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Work at bench cut-out <input type="checkbox"/> Clear cut-out of clutter <input type="checkbox"/> Provide footrest <input type="checkbox"/> Provide foot ring	
	21. Are microscope work breaks provided?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Institute work rotation <input type="checkbox"/> Institute work breaks	





		Yes	No	Change/Modification	Comments
	Pipettes				
	22. Is manual pipette use limited to less than 4 hours per day?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Institute work rotation <input type="checkbox"/> Institute work breaks <input type="checkbox"/> Consider use of alternative pipettes	
	23. If pipette use is more than 4 hours per day, are multi-channel, electronic or latch mode pipettes available?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Evaluate use of alternative pipettes <input type="checkbox"/> Electronic <input type="checkbox"/> Latch-mode <input type="checkbox"/> Multi-channel	
	24. Have employees been trained to select appropriate pipettes for pipetting task?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Employee training	
	25. Are racks, trays, beakers and supplies available and placed within easy reach?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Provide racks and trays <input type="checkbox"/> Position supplies within close reach <input type="checkbox"/> Use pipette racks and organizers	
	26. Are vials, tubes and receptacles as low profile as possible?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Provide short beakers and vials <input type="checkbox"/> Provide short tips and tubes <input type="checkbox"/> provide short/angled waste receptacles	

		Yes	No	Change/Modification	Comments
	27. Do workers pipette with shoulders relaxed, and arms and wrists in neutral postures?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Employee posture training <input type="checkbox"/> Adjust work position <input type="checkbox"/> Adjust workstation set-up	
	28. Are rest breaks provided?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> provide work breaks or work rotation	
Micromanipulation					
	29. If forceps are used for prolonged periods, are locking mechanisms, o-rings or other adapted aides used to reduce prolonged or static pinch forces?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Provide adapted tweezers/forceps <ul style="list-style-type: none"> <input type="checkbox"/> O-rings <input type="checkbox"/> Pads/foam grips <input type="checkbox"/> Self-closing <input type="checkbox"/> Low force tools <input type="checkbox"/> Alternate fingers/hands	
	30. Are vials easy to cap and thread?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Provide easy opening caps <input type="checkbox"/> Provide vials with minimal number of threads	
 	31. Are cap openers available?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Provide decapping tools	
	32. Are clamps and holders available to support test tubes and other materials that must be help for prolonged periods?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Provide vial clamps <input type="checkbox"/> Provide racks, holders, shelves, or organizers	

		Yes	No	Change/Modification	Comments
	Microtome/Cryostat				
	33. Can workers operate the microtome with hands in a pistol grip position? (Wrist aligned with forearm and in handshake position)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Re-position worker <input type="checkbox"/> Re-position height, angle or position of microtome <input type="checkbox"/> Employee training in work postures <input type="checkbox"/> Use foot operated controls <input type="checkbox"/> Modify handle position	
	34. Is equipment placed in a bench cut out allowing for adequate leg and knee clearance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Work at bench cut-out <input type="checkbox"/> Clear area around microtome/cryostat of obstacles	
	35. Is an adjustable chair available at the microtome or cryostat that provides back and foot support?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Provide adjustable chair <input type="checkbox"/> Provide chair with head support if working in reclined position <input type="checkbox"/> Consider mirror system to improve view of samples	
	36. Do employees have access to a motorized microtome/cryostat for high intensity/volume work?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Consider electronic cryostat for high volume workloads	
Laboratory Hoods and Biosafety					

		Yes	No	Change/Modification	Comments
	Cabinets				
	37. Is leg, knee clearance available to promote neutral sitting postures when using the hood or cabinet?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Clear knee area under cabinet or hood <input type="checkbox"/> Use sit/stand stool	
	38. Can workers work with shoulders relaxed when sitting or standing?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Consider height adjustable hood or cabinet <input type="checkbox"/> Use height adjustable stool/chair	
	39. Is padding available to reduce soft tissue compression (edge padding or arm pads)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Use elbow pads <input type="checkbox"/> Use edge padding <input type="checkbox"/> Use arm supports	
	40. Are materials inside the hoods and cabinets as close as possible to the worker to avoid over-reaching?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Position receptacles within close reach <input type="checkbox"/> Use turntables, rotating organizers, angled platforms	

		Yes	No	Change/Modification	Comments
	<p>41. Are vials, tubes and receptacles as low profile as possible?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Provide low profile vials, tubes and receptacles <input type="checkbox"/> Angle receptacles to position within closer reach	
	<p>42. Are anti-fatigue mats used if employees stand for more than 4 hours per day?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Provide anti-fatigue mats <input type="checkbox"/> Provide foam insoles for shoes <input type="checkbox"/> Provide supportive shoes	
Miscellaneous					
	<p>43. Are bottle dispensers and bottom dispensing carboys available to dispense liquids?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Provide bottle dispensers <input type="checkbox"/> Provide bottom dispensing carboys <input type="checkbox"/> Provide bottles with handles	
	<p>44. 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?</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Provide storage for supplies <input type="checkbox"/> Place heavy items on shelves between knees and chest level	

		Yes	No	Change/Modification	Comments
	45. Are cut-outs clear of storage and available for use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Clear cut-outs of clutter <input type="checkbox"/> Provide cut-out areas for working at bench using work surface cut-outs or platforms	
	46. Are jars easy to open or are jar openers available?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Provide jar openers	
	47. Are temporary platforms available for tasks that require elevating arms above chest level for prolonged periods?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Consider standing platforms or elevated work areas (Consider safety issues and reduce fall risks before using)	
	48. Are there adequate bins and racks for frequently used items?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Provide bins, racks and shelves for frequently used items	