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| C:\Users\susanb\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Word\PRIMARY_A_Vertical_Housed_RGB.PNG | Health & Safetyguide to the manual handling hierarchy of control |

| If your work involves risks associated with *hazardous manual handling*, there are specific duties and obligations you need to comply with under the Occupational Health and Safety Act (OHS Act) 2004 and Occupational Health and Safety Regulations (OHS Regulations) 2017. This guide provides detailed assistance with selecting appropriate risk controls for manual handling tasks. Use this guide in conjunction with the [Health & Safety: Hazardous manual handling risk assessment form](https://safety.unimelb.edu.au/__data/assets/word_doc/0008/4682879/hazardous-manual-handling-risk-assessment.docx). For more information, refer to; <https://safety.unimelb.edu.au/safety-topics/management-systems/implement><https://www.worksafe.vic.gov.au/hazardous-manual-handling-safety-basics>, or contact your local [Health and Safety Business Partner](https://safety.unimelb.edu.au/health-and-safety-contacts). |
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| ***Hazardous manual handling*** means work requiring the use of force exerted by a person to lift, lower, push, pull, carry, or otherwise move, hold or restrain: • a thing if the work involves one or more of the following:  - repetitive or sustained application of force  - sustained awkward posture  - repetitive movement - application of high force involving a single or repetitive use of force that it would be reasonable to expect a person in the workforce may have difficulty undertaking - exposure to sustained vibration  • live persons or animals  • unstable or unbalanced loads or loads that are difficult to grasp or hold.  Most jobs involve some form of manual handling. Whilst not all manual handling tasks are hazardous, opportunities should always be taken to review and improve the way manual tasks are undertaken with the objective of reducing the manual effort involved. It's important to consult with users involved in the manual handling particularly when planning to implement controls that include introducing new ways of working, new plant or equipment, or, renovating, refurbishing or relocating a workplace. Consulting with users is likely to result in better risk control measures because it gives them the opportunity to contribute ideas, participate in trials and mock-ups for new risk control measures, and is likely to improve the uptake of risk control measures when they are implemented. Discussions with different people in the supply chain (e.g., suppliers, industry bodies and associations) may also assist.The following table outlines the manual handling hierarchy of control and details a range of control measures. Under this hierarchy the highest level of control (or protection) must be considered and applied, so far as is reasonably practicable, before considering the level below it. It is necessary to work down the hierarchy of control until the risk of musculoskeletal disorder (MSD) is eliminated or reduced so far as reasonably practicable. Often it will be necessary to use a combination of risk control measures to effectively control the risk of MSD. Note that good posture and lifting techniques can help reduce the risks, but research indicates that making changes to workplace design is the most effective way to prevent manual handling injury. |
| Control Type | How to Control Risk | Control Options to be Considered |
| **E: ELIMINATE**   |
| Try to remove the actionthat could cause the injury | Consider if the task needs to be carried out? Can it be done in another way?  | Examples might include ordering bulk bags or containers of stock that are handled with a mechanical aid to eliminate the requirement to carry them or automating processes e.g., book sorting machines  |
| **CW**: **CHANGE THE WORKPLACE OR WORK** |
| Reduce the risk of injury bymaking changes to the workplace, the work and the things used in the work | Alter the layout/ design of the workplace or workstation. A well-designed work area will assist in ensuring safest postures are maintained and awkward postures are minimised. | * Ensure there is enough space and clearance for the required number of people to perform the work without restriction. Consider how people move and interact in the workspace, operate equipment (including equipment such as hoists, trolleys) and handle materials and loads. Examples include sufficient knee and foot clearance to get close to the task, adequate passage width to move with loads without turning sideways or altering posture.
* Position controls, displays, materials and tools so they are in front of and directly facing the person, towards the middle of the body, within comfortable reaching distance without having to bend the trunk.
* Select electronic or foot controls rather than hand controls if considerable force is required.
* Provide well-designed, accessible storage to minimize handling and effort. Where possible avoid shelves with a steel mesh base or raised lips at the front edge. These features increase force and effort when retrieving or returning items to storage. Teflon strips or other treatments can facilitate sliding and reduce manual effort.
* 1 Aerobic StepperInstall easily adjustable work surfaces to suit a wide range of people and the work they perform. Whatever the work, the working height and objects used in the work should be *roughly level with the person’s elbows*, whether sitting or standing. This will allow the shoulders to be relaxed (not raised) and the upper arms close to the body. For example, to perform light manipulative work including typing the work surface should be just below elbow height. To perform work incorporating a range of arm movements involving the shoulder E.g., pipetting, the surface should be below elbow height. To perform heavy work requiring considerable muscular effort or use of the body for leverageE.g., cutting, hammering or where bench mounted equipment to be used is bulky e.g., cryostat or microtome the work surface should be well below elbow height. If a fixed height surface is necessary should be positioned at a height that does not physically disadvantage any user group. - Consider whether taller users can sit to work to achieve a more comfortable work height? - Can shorter users stand on a suitable raised platform to achieve a more comfortable work height? E.g., *An exercise step may offer a suitable means of raising the shorter user but will require a risk assessment before introduction.*
* Design the workplace to provide opportunities for employees performing seated or standing work to vary their postures and movement
* Supply fully adjustable task seating with swivel mechanism and castors suited to the rolling resistance of floor surface i.e., allowing the chair to roll at a safe speed. Applying castor brakes to 2 (of 5) castors can be a solution for low rolling resistant floors such as vinyl or concrete.

Avoid applying castor brakes that fully lock movement when chair is either occupied or unoccupied as these scenarios involve exerting effort to move the chair. If the floor has too much resistance to chair rolling (requiring undue physical human effort to overcome) a low pile non-slip carpet square at least 1m2 with tapered edges may be useful.* Supply fit for purpose step stools or ladders or other safe means of elevation to reduce reach where required.
* Supply low stools to sit astride where work at low heights for extended periods is required e.g., shelving books at low levels, working with young children.
* Use an intermediary step/surface if there is a need to move bulky or fragile items either up from a low point e.g., glassware stored on a low shelf under a chemistry bench lab, or items down from a high shelf using a stepstool e.g., archive boxes. This prevents handling a load in an awkward unstable posture.
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|   | **Adjust the environmental conditions e.g:** Environmental conditions include vibration, heat or cold, humidity, wind, flooring, surfaces, and lighting. Altering these conditions can help control MSD risks. | **Vibration**: Isolating vibration is the goal however may not always be possible due to multiple natural frequencies and dynamic loads* Whole body vibration - dampen vibration to dissipate energy using rubber or pneumatic mounts or pads or engine mountings e.g., ensure operator seats on tractors are mounted on suspension systems incorporating spring and damper elements.
* Ensure equipment is operated in compliance with the manufacturer’s instructions -particularly speed which directly influences vibration rate
* Hand-arm vibration – change manufacturing and construction methods or processes to eliminate the need for vibrating equipment. Where this is not reasonably practicable, the best strategy is to purchase tools and equipment that produce less vibration.
* Ensure regular maintenance of equipment/machinery.

**Hot and cold, humidity and wind:** * Relocate work if possible.
* Alter work schedules so that work is done at less extreme times.
* Regulate temperature and airflow with heaters, fans, ventilation.
* Ensure work is conducted at an appropriate pace with opportunity for regular breaks (a cool place if working in heat or warm place if working in cold)
* Provide Personal Protective Equipment (PPE) and clothing which is comfortable and not restrictive including gloves with adequate grip.
* Control individual thermal comfort requirements with suitable clothing.

**Flooring surfaces:** * Ensure the flooring surface is level, clean and non-slip. Choice of flooring should consider comfort for standing and minimization of forces if movement of trolleys across the floor is required.
* Where anti-fatigue mats are required ensure, they do not pose a trip hazard and do not have to be moved in order to position a chair at the work point

**Lighting:** Select lighting to suit the work performed to prevent awkward or sustained postures that may arise from low or excessive levels of lighting, glare, or reflection: * + provide additional lighting, such as a lamp on a flexible arm with dimming capability if required
	+ improve the layout of existing light fittings by lowering or raising them or changing their position in the work area
	+ increase or decrease the number of lights or change globes to improve light levels, quality or improve colour perception
	+ change the diffusers or reflectors on existing lights
	+ change the orientation or position of the item to avoid shadows, glare, or reflections
	+ clean lights and light fittings regularly
	+ use screens, visors, shields, hoods, curtains, blinds, or external louvres to reduce reflections, shadows, and glare
	+ ensure working surfaces are matte finish and non-reflective
	+ control natural light sources (particularly bright sunlight) on work pieces, screens and work surfaces by orientation and placement at 90 degrees to the source or by providing screening and louvres
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|  | **Alter the Systems of Work e.g., Job design, pace, and flow, Resources and personnel** | **Work design and flow:** * + design and implement systems of work that minimise the need for unnecessary steps, undue effort, and multiple points of handling
	+ have materials delivered, located, or transferred mechanically to the location or work area where they will be used or on mobile systems (e.g., *on wheeled trolleys*)
	+ request suppliers deliver products, items or tools in a way that allows them to be used without the need for additional handling e.g., *flat packs delivered on a vertical frame.*
	+ locate storage areas close to distribution areas.
* ensure storage is organized so larger items are stored at floor level and can be moved using mechanical equipment or a hand trolley, frequently used lighter items are located between chest and mid-thigh and infrequent items above
	+ allow employees to control the pace of work, speed of machines, rotation of tasks and when they take brief rest breaks
	+ ensure the right equipment is available to do the work and it is well- maintained
* set realistic work deadlines.

**Working position:** * determine whether activities performed at a workstation are best suited to sitting or standing. consider: does work involve small forces, light work, or static controlled movements close to the body? for example, pipetting is better suited to sitting; or
* does it involve long reaching movements, handling large or bulky objects or loads, and dynamic postures? for example, library service loans desk work is better suited to standing.

**Resources and personnel**: * schedule and review appropriate personnel levels, skill mix and shift arrangements to reduce exposure to risks of MSD allowing for peak times. This should ensure a person under time pressure does not try to complete the work on their own.

• collaborate and consult with people about the way work is organized and carried out* encourage people to adhere to scheduled breaks to enable sufficient rest and recoveryAllow adequate opportunity for brief rest breaks (micro pauses) to restore circulation, rest working muscles and help manage physical and mental fatigue.
* ensure help from team members is available when necessary. Where team handling is required, employees should be similar in size and physical capacity and be trained in the same approach to performing the task.

**Housekeeping:*** Ensure regular housekeeping is undertaken to remove obstructions which may represent trip or strike hazards and reduce clutter which may cause people to adopt awkward postures such as reaching, stretching, and bending.
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|  | Change the things used in the task**Use mechanical aids** Modify the load being handled Modify tools & equipment Provide mechanical aids | When controlling MSD risk, the nature, shape, size, weight, and number of the things used in the work should be considered. This may include the characteristics of the loads handled, tools and equipment used and the condition of the tools and equipment. **Loads:** * Minimise weight of object by reducing packing size.
* Maximise ease of grip and ability to handle the object close to the body.
* Ensure provision for appropriate handles and hand -holds to facilitate control.

**Tools:** Use power tools in preference to hand tools where possible • suspend or support heavy tools where they are used repetitively and in the same place• counterbalance heavy tools that are used repetitively and need to be used away from the body • use trigger locks where a hand grip has to be sustained for more than 30 seconds • hold the work piece in place with either jigs or fixtures • select tools that produce the least amount of vibration • reducing impact shocks • limiting torque or ‘kick back’ reactions Figure 2 - Tools with bent or angled handlesIf hand tools are used, they should be designed and selected to: • be held in a neutral wrist or handshake position • allow the hand to retain a comfortable grip span • be light and well-balanced (the heaviest part of the tool needs to be behind the wrist) • be suitable for use in either hand • provide a contact surface that facilitates a good grip with no pinch points or inbuilt mouldings • prevent an employee from adopting a pinch grip with high force or sustained for prolonged periods• require minimal force exertion Mechanical aids or materials handling devices often take all or part of the weight of the object and reduce the force required to move the object. Examples include:* hoists • wheelbarrows
* trolleys (electric or manual), dollies • long handled reaching equipment

**Lifters:** • slings and straps* conveyors, turn tables • slide sheets
* wheel or castors • harnesses
* Before selecting mechanical aids:
* consult with the people performing the work to identify the best solution

 undertake a pre-purchase risk assessment * seek the manufacturer or supplier’s risk assessment
* trial equipment where possible to ensure that it is effective and does not introduce new risks.
* Sometimes equipment may need to be customized for a specific task
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| **A:** **ADMINISTRATIVE CONTROLS:**   |
| Provide information, instruction, or training on how to reduce the risk of injuries. This may be used as a risk control measure to support higher order risk control measures or as an interim risk control. It should not be used as the sole or primary means to control the risk of MSD where higher level controls are reasonably practicable | Training in team handling and job rotation. Providing Signage and Standard Operating Procedures (SOPs) | **Training** that covers:* instruction in effective job rotation
* effective team handling
* task specific methods- hands on training tailored to the work undertaken
* Safe Operating Procedures

**Team handling:** Team handling is manual handling of a load by two or more employees. To be effective it is important to ensure: • the number of employees in the team is in proportion to the weight of the load and the difficulty of the lift • enough space is available for the handlers to manoeuvre as a group • the team are of similar height and capability, are trained in the method and a leader is appointed• appropriate aids are available and used to assist with handling (e.g., stretcher, slings, straps, lifting bars, lifting tongs, trolleys, hoists) **Job rotation:** Job rotation involves alternating employees for defined time periods through a series of work tasks that require different postures, movements, and forces. The work tasks must be sufficiently different to ensure different muscles are being used in different ways allowing for rest and recovery. **Task specific training:**The focus of task specific training is to assist people to:* Recognise the risks and the sources of risks associated with the manual tasks, and in consultation decide the best way to minimise them.
* Prepare the workplace layout and environment to perform manual tasks safely.
* Prepare the load, where applicable.
* Organise the task and workflow to minimise the risk of injury.
* Select, adjust, and use relevant mechanical aids and handling devices.
* Select, adjust, and use relevant tools and equipment; and
* Perform and maintain safe work practices.

*It is important to note training in specific physical techniques in a classroom does not address the source of the manual handling risk, is not easily transferred to real-life situations, and doesn’t prevent cumulative loading on the body.***Standard Operating Procedures:** * Standard Operating Procedures (SOPs) are designed to define steps and processes to help employees carry out the operations correctly and consistently in the same manner. Employees should be familiar with all relevant SOPs, and they should be readily accessible and prominently displayed in the workplace
* Other safety signage and information may be used to inform about weights of loads and method of handling, loading tolerances of trolleys, shelving, ladders, and shelving.
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