

Compliance code

Hazardous manual handling

Edition 2

December 2019



Part 1 – Introduction

Purpose

1. The purpose of this Code is to provide practical guidance to duty holders about how to comply with their duties under the OHS Act and Part 3.1 of the OHS Regulations in relation to managing health and safety risks associated with hazardous manual handling.

Note: The word **must** indicates a legal requirement that has to be complied with. The words **need(s) to** are used to indicate a recommended course of action in accordance with duties and obligations under Victoria's health and safety legislation. The word **should** is used to indicate a recommended optional course of action.

Scope

2. This Code provides information for duty holders about meeting their obligations under Part 3.1 of the OHS Regulations as well as providing information about how to identify hazards and control risks associated with hazardous manual handling. This Code also provides information for duty holders about compliance with the OHS Act, where relevant (for example, an employer's duty to consult with employees).
3. It is not possible for this Code to deal with every risk associated with hazardous manual handling a duty holder may encounter at their workplace. The guidance in the Code needs to be considered with regard to the particular characteristics and circumstances of the workplace.

Application

4. This Code applies to employers, employees, designers, manufacturers and suppliers. Additionally, it may be useful for HSRs.

What is hazardous manual handling?

5. 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 that 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.
- OHS Regulations r5

Part 1 – Introduction

What is a musculoskeletal disorder (MSD)?

6. An MSD is an 'injury, illness or disease that arises in whole or in part from hazardous manual handling, whether occurring suddenly or over a prolonged period'. Injuries can also occur due to a combination of both these mechanisms, for example body tissue that has been weakened by cumulative wear and tear may be vulnerable to sudden damage from a strenuous task. Musculoskeletal disorders (MSDs) do not include an injury caused by crushing, entrapment or any cut resulting primarily from the mechanical operation of plant. OHS Regulations r5

MSDs include:

- sprains and strains of muscles, ligaments and tendons
- back injuries, including damage to the muscles, tendons, ligaments, spinal discs, nerves, joints and bones
- joint and bone injuries, including injuries to the shoulder, elbow, wrist, hip, knee, ankle, hands and feet
- nerve injuries or compression (for example carpal tunnel syndrome)
- muscular and vascular disorders
- chronic musculoskeletal pain
- soft tissue hernias.

Who has duties?

7. **Employers** must provide and maintain, so far as is reasonably practicable, a working environment for their employees that is safe and without risks to health. OHS Act s21 To ensure that employers provide a working environment that is safe and without risks to health, they must eliminate risks to health and safety so far as is reasonably practicable, and if it is not reasonably practicable to eliminate the risks to health and safety, reduce those risks so far as is reasonably practicable. OHS Act s20

For information about what reasonably practicable means when complying with Part 3 of the OHS Act or the OHS Regulations, see the WorkSafe Position *How WorkSafe applies the law in relation to reasonably practicable* at worksafe.vic.gov.au.

8. Employers must, so far as is reasonably practicable, monitor conditions at any workplace under the employer's management and control. OHS Act s22(1)(b)
9. Employers must also, so far as is reasonably practicable, ensure that persons other than employees are not exposed to risks to their health or safety arising from the business activities undertaken by the employer. OHS Act s23
10. An employer's duties under section 21 and section 35 of the OHS Act extend to independent contractors engaged by the employer and any employees of the independent contractor working at the workplace. However, these extended duties are limited to matters over which the employer has control or would have control if there was not an agreement in place purporting to limit or remove that control. OHS Act s21(3) and s35(2)

Part 2 – Hazard identification

Table 1 – Examples of hazardous manual handling

Work involving	Examples	
Repetitive or sustained application of force	<u>Repetitive force:</u> ▪ lifting and stacking goods onto a pallet ▪ gripping and handling bricks and a trowel when bricklaying (see Figure 1) ▪ using a nail gun to fix palings to a fence ▪ pressing a pedal or button to operate a power press. <u>Sustained force:</u> ▪ pushing or pulling a trolley around hospital wards (see Figure 2) ▪ holding down a trigger to operate a power tool ▪ supporting a plaster sheet while fixing it to a ceiling ▪ continuing to hold a tool when not using it.	 Figure 1 – Bricklaying  Figure 2 – Pushing a trolley
Sustained awkward posture	▪ reaching sideways to place goods into a stillage ▪ crouching to service plant or a vehicle ▪ lying underneath a vehicle and reaching upwards to service it ▪ kneeling while trowelling concrete or laying carpet ▪ bending to prune pot plants (see Figure 3) ▪ standing and holding a stop/slow bat during traffic control ▪ bending over to bathe a patient.	 Figure 3 – Pruning

Part 2 – Hazard identification

Work involving Examples

Repetitive movement

- painting
- lifting goods from a conveyor belt and packing them into a carton
- typing and other keyboard tasks (see Figure 4)
- picking orders in warehousing
- assembly work in manufacturing
- boning meat or processing fish
- using a socket and ratchet or spanner to unscrew long bolts.



Figure 4 – Typing

Application of high force

- lifting or carrying a heavy object
- pushing or pulling an object that is hard to move
- operating tools (for example tin snips) with squeeze grips that are too far apart
- throwing or catching objects
- lifting a heavy item from a high shelf
- steadying a patient who has become unsteady walking
- continually picking up heavy boxes (see Figure 5).



Figure 5 – Lifting heavy boxes

Exposure to sustained vibration

Whole-body vibration:

- operating earth moving plant
- driving a tractor, crane or forklift (see Figure 6)
- using ride-on mowers and skid-steer loaders.

Hand-arm vibration:

- using chainsaws and other mechanised saws
- using impact tools, including jackhammers, vibrating plates, chippers and pavement breakers
- using mechanical digging tools, including spade and ditch diggers and small augers
- using powered hand tools, including drills (see Figure 7), pneumatic nut runners, impact wrenches and grinders, lawnmowers and brush cutters.



Figure 6 – Driving a forklift



Figure 7 – Using a powered hand tool

Part 2 – Hazard identification

Work involving	Examples	
Live persons or animals	▪ assisting a mobility-impaired patient ▪ treating a panic-stricken animal in a veterinary clinic ▪ handling a horse ▪ lifting children in and out of cots (see Figure 8) ▪ transferring a hospital patient from a bed to a chair.	 Figure 8 – Lifting a child out of a cot
Unstable or unbalanced loads or loads that are difficult to grasp or hold	▪ lifting a sack of flour ▪ carrying an open cooking pot full of soup ▪ carrying a large sheet of plasterboard ▪ carrying a ladder (see Figure 9), especially if it tilts ▪ carrying a laundry bag full of linen ▪ carrying products in containers with no handles.	 Figure 9 – Carrying a ladder

Part 3 – Assessing the risks

46. A risk assessment involves examining work that has been identified as involving hazardous manual handling in more detail to assess whether it is arranged in a way that gives rise to a risk of MSD.
47. An employer must, so far as is reasonably practicable, control risks of MSD associated with hazardous manual handling. **OHS Regulations r27** In order to do this an employer needs to first determine whether particular hazardous manual handling work creates a risk of MSD. This can be done by carrying out an assessment of the work.
48. A formal risk assessment is unnecessary if knowledge and understanding about the risk, and how to control it already exist. For example, an employer who knows there is a risk of MSD associated with carrying an item over a long distance and knows that the risk can be eliminated through use of a height-adjustable four-wheeled trolley, can put the control in place immediately. However, if employers are unsure how to control risk of MSD, a risk assessment can help.

How to determine a risk of MSD

49. Employers must, so far as is reasonably practicable, consult with employees (including any HSRs and independent contractors) when conducting a risk assessment. **OHS Act s35**
50. When examining work, employers should consider:
 - postures, movements and forces
 - duration and frequency
 - environmental conditions (including heat, cold and vibration).
51. Working through the following questions may help employers assess if there is a risk of MSD (the risk assessment and control worksheet at **Appendix D** may be used to record the findings).

Questions to help assess MSD risk

Question one – Does the work involve any repetitive or sustained forces, sustained awkward postures or repetitive movements?

As a general guide, **repetitive** means performed more than twice a minute, and **sustained** means held for more than 30 seconds at a time.

Part 3 – Assessing the risks

Table 2 – Examples of postures, movements and forces that pose a risk if they are repetitive or sustained

Bending or twisting the back forwards or sideways (more than 20°).

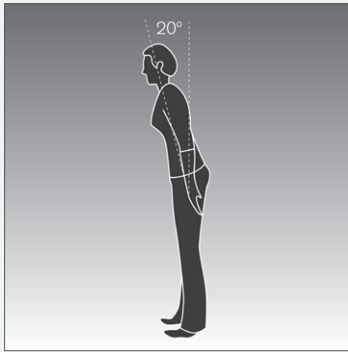


Figure 10

Visibly bending the back backwards (more than 5°).

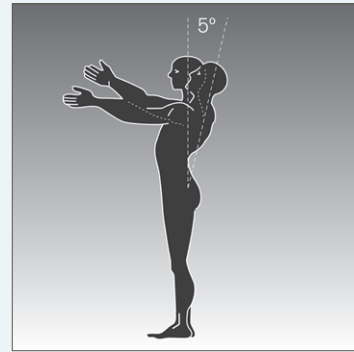


Figure 11

Bending the head forwards or sideways (more than 20°) or twisting the neck (more than 20°).

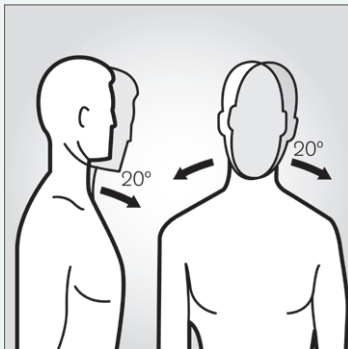


Figure 12

Visibly bending the head backwards (more than 5°).

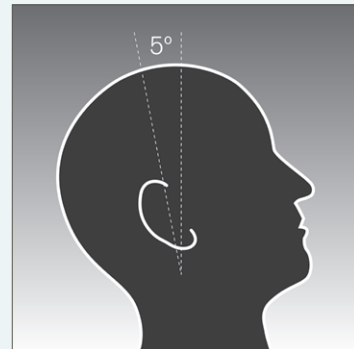


Figure 14

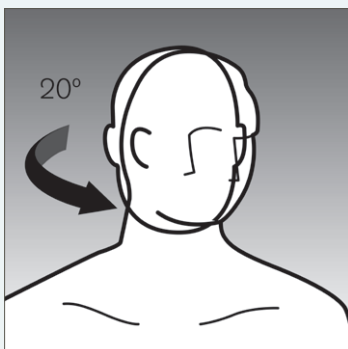


Figure 13

Part 3 – Assessing the risks

Working with one or both hands above shoulder height.



Figure 15

Reaching forward or sideways more than 30cm from the body.



Figure 16

Reaching behind the body.



Figure 17

Excessive bending of the wrist.



Figure 18

Twisting, turning, grabbing, picking or wringing actions of the fingers, hands or arms.



Figure 19

Squatting, kneeling, crawling, lying, semi-lying or jumping.



Figure 20

Part 3 – Assessing the risks

Standing with most of the body's weight on one leg.

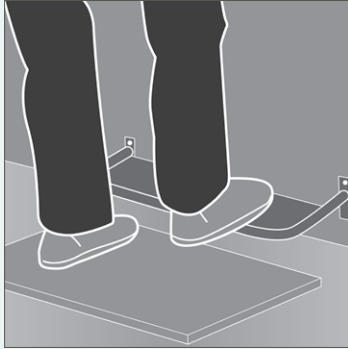


Figure 21

Lifting or lowering.



Figure 22

Carrying with one hand or one side of the body or exerting force with one hand or side of the body.



Figure 23

Pushing, pulling or dragging.



Figure 24

Very fast movement.



Figure 25

Exerting force while in an awkward posture.



Figure 26

Part 3 – Assessing the risks

Gripping with the fingers pinched together or held wide apart.

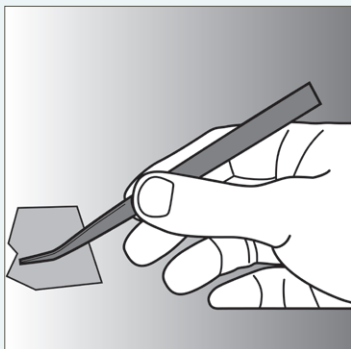


Figure 27

Applying uneven, fast or jerky forces.



Figure 28

Holding, supporting, or restraining a live animal or person.

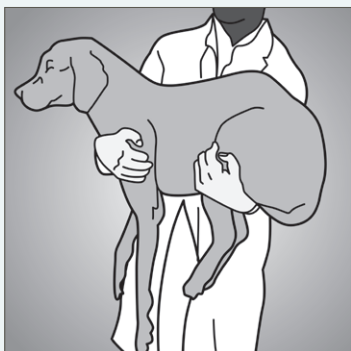


Figure 29



Figure 30

The risk is greatest when the postures and movements are towards the end of the movement range, particularly when they feel uncomfortable for the employee.

Part 3 – Assessing the risks

Question two – Is the work undertaken for a long duration?

If you have assessed the work as involving postures, movement or forces that are repetitive or sustained, you should also look at the duration of the work.

Consider how long the work is performed over the course of a whole shift or continually at any time during a shift. Work that continues over a long period or is repeated during the work day increases the risk of MSD.

As a general guide, work is undertaken for a **long duration** if it is performed for more than two hours over a whole shift or continually for more than 30 minutes at a time.

If you answered yes to questions one and two, the work involves a risk of MSD and must be controlled.

Question three – Does the work involve high force?

High force means an activity involving a single or repetitive use of force that it would be reasonable to expect that a person in the workforce may have difficulty undertaking. Work involving high force can cause MSD even if it is not repetitive or sustained. This means that any work involving high force may pose a risk, even if only done occasionally or for short periods. The longer and more often force is applied and the higher the force, the greater the risk of MSD.

Some work that requires force involves the whole body (eg lifting, lowering and carrying heavy weights, or pushing a heavy load), while other work involves some parts of the body only, such as the hands and arms (for example operating hand tools with tight squeeze grips). During the application of high force, the body is often in a bent, twisted or otherwise awkward posture.

A small amount of force could be considered high force if the small muscles of the hands are used to perform the work.

The risk in work involving high force is affected by:

- the intensity of the force needed – forceful muscular exertions place high stress on the muscles, tendons, joints, ligaments and vertebral discs
- the speed involved – fast movements (particularly if repeated) can injure muscles, tendons and ligaments
- whether the force is jerky or sudden – forces suddenly applied or stopped can overload the muscles, tendons, joints, ligaments and vertebral discs. This can occur when throwing or catching things, when something moves unexpectedly (for example when pulling up a fence post that suddenly comes free) or when assisting people (for example when assisting and catching a patient who suddenly falls).

High forces are commonly associated with the handling of live persons or animals and loads that are unstable, unbalanced or difficult to hold.

Note: For some complex situations, expert or specialist advice may be useful when determining the risk of MSD.

Part 3 – Assessing the risks

Table 3 – Examples of high force

- lifting, lowering or carrying heavy loads (see Figure 31)
- applying uneven, fast or jerky force
- applying a sudden or unexpected force
- pushing or pulling objects that are hard to move or stop
- using a finger-grip, a pinch-grip or an open-handed grip to handle a heavy or large load
- exerting force at the limit of the grip span (see Figure 32)
- needing to use two hands to operate a tool designed for one hand
- high impact throwing, catching, hitting or kicking (see Figure 33)
- exerting force with the non-preferred hand
- exerting a high force while in a bent, twisted or otherwise awkward posture
- a heavy or bulky load that needs two or more people to lift.



Figure 31 – Lifting a heavy bag of wheat

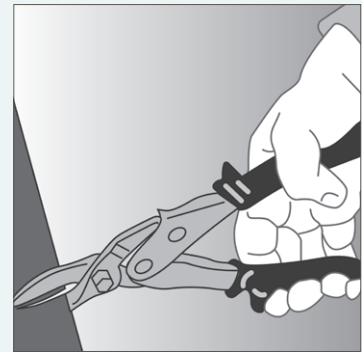


Figure 32 – Using tin snips on sheet metal



Figure 33 – Hitting a hub cap

If you answered yes to question three, the work involves a risk of MSD and must be controlled.

Part 4 – Risk control measures

Table 4 – The hierarchy of control for controlling the risk of MSD associated with hazardous manual handling

Level	Action
1. Eliminate the risk of MSD	Remove the action that gives rise to the risk of MSD. For example, use bulk bags or containers of stock that are handled with a mechanical aid to eliminate the requirement to carry them (see Figure 34).
2. Reduce the risk of MSD by making changes to the workplace or work	- Alter the workplace layout (eg change the height and placement of machinery, equipment and furniture used in the work); position frequently used controls in front of employees to reduce twisting movements and awkward postures. - Alter the workplace environment where the work involving hazardous manual handling is undertaken (eg limit exposure to environmental factors such as heat, cold and vibration); provide additional lighting for the work; widen doorways; fix floor surfaces. - Alter the systems of work used that involves hazardous manual handling (for example provide buffers to allow materials to be taken off-line); allow employees to control the pace for critical or physically demanding tasks; reorganise pace and flow of work, change shift length. - Change the things used in the hazardous manual handling (eg modify the shape or weight of the load being handled, or the tools and equipment used); provide handles or holding points on an object to make it easier to grip. - Use mechanical aids (eg use an order picking forklift with a furniture cage when moving furniture to racking); use a vacuum operated lifting device to load products onto pallets; use overhead hoists to transfer patients.
3. Reduce the risk of MSD by providing information, instruction or training	Provide employees with information, instruction or training on how to reduce the risk of MSD (eg provide training on effective job rotation or more effective team handling).



Figure 34 – Forklift moving one tonne bulk bag

Part 4 – Risk control measures

Altering the workplace layout

64. The physical features of the workplace can affect the way employees work and can increase the risk of MSD. A well-designed work area will assist an employer to eliminate or reduce the degree of reaching, twisting or bending.

Workstation or work area design

65. Workstations and work areas should be designed to allow employees to work in an upright position with their shoulders in a natural position (not raised). Their upper arms should be close to the body most of the time and large reaches should not be required to perform the work. Work surfaces should be easily adjustable to suit a range of employees and the work they perform. The working height and objects used in the work should be roughly level with the employee's elbows, whether the work is done sitting or standing.

See **worksafe.vic.gov.au** for more information on health and safety in the office.

66. Where it is not possible to provide adjustable workstations or work areas, consider altering the design so that:
- the workstation or work area height suits the widest range of physical characteristics of employees
 - reaching distances suit different employees
 - knee and leg clearances suit employees of different sizes.

Note: In some workplaces a 'workstation' or 'work area' may not be a standard office or production line set-up, for example it could be a bed or car.

Working heights

67. Work with high visual demands should be performed above elbow height and work surfaces may need to be tilted. For example work involving delicate or precise manipulation.
68. Work involving a narrow range of hand movements where hands can rest on the work surface should be performed at, or just above, elbow height. A sloping surface may reduce requirement to bend the neck forward to perform desk-based work, such as drafting (see Figure 36).



Figure 36 – Sloping drafting desk

69. Light manipulative work or work involving the use of a keyboard should be performed at just below elbow height.
70. Work incorporating a range of arm movements using the shoulder should be performed between hip and shoulder height. For example, taking items from a stack and placing them on a conveyor.
71. Work requiring considerable muscular effort or use of the body for leverage should be performed at hip height. For example, drilling at a workbench.

Part 4 – Risk control measures

72. Where possible, place work items so they are:
- in front of the employee
 - between waist and shoulder height
 - towards the middle of the body and facing the employee
 - on the employee's preferred side
 - positioned within comfortable reaching distance
 - positioned to avoid double handling and to avoid moving loads over long distances.
73. Displays and operator controls should be positioned to encourage comfortable head and neck postures, comfortable hand and arm reach and efficient use. Employers should:
- place frequently used displays and operator controls, including keyboards and other input devices, directly in front of the employee
 - position operator controls at comfortable elbow height
 - select electronic or foot controls rather than hand controls if high force is required
 - place pedals so that employees can operate them from a comfortable seated position.

Working position

74. Employees should not remain in a seated, standing or otherwise static posture for prolonged periods. Design the workplace to provide opportunities for employees performing seated or standing work to vary their postures and movements (see Figure 37).



Figure 37 – Sit to stand desks

75. For seated tasks, seating should have the following features:
- adjustable seat height and angle (see Figure 38)
 - a contoured backrest with a lumbar curve, except where the backrest would interfere with the actions to be performed
 - a swivel action to prevent the employee from twisting to reach workstation components
 - rounded seat edges
 - a five-point base with castors to allow movement on carpet and gliders fitted to the base for low-resistance flooring (where access to work items located beyond the normal reach is required)
 - a footrest or foot ring fitted on drafting or higher chairs to support the feet.

Part 4 – Risk control measures



Figure 38 – Fully adjustable office chair

76. A seated work position is best for:
- work that requires fine manipulation, accurate control or placement of small objects
 - close visual work that requires prolonged attention
 - work that involves operating a foot pedal.
77. Employees carrying out work that requires standing should be provided with:
- a chair, stool or support so that the employee can alternate between sitting and standing
 - a footrest (large enough for the whole foot) to allow the employee to stand with either foot raised
 - suitable floor covering to cushion concrete and other hard floors
 - suitable footwear with appropriate cushioning.

78. A standing work position is best when:
- large, heavy or bulky loads are handled
 - forceful movements are required
 - reaching is required
 - movements away from the working position are frequent
 - there is no knee room
 - there is limited space.

Work space

79. Work areas need to have enough space to accommodate the number of employees and other people involved in the work, any equipment that might be required and space to operate the equipment safely.
80. There should be enough space or clearance to:
- walk around loads, items stored in the workplace, or other employees
 - access or store equipment or materials
 - use equipment or materials needed to do the work
 - move and turn, particularly when handling loads
 - sit or stand close to the work surface with clear space under the work surface for the feet or legs.

For example, when employees of an aged care facility are required to assist an infirm person to bathe, the bathroom may need to accommodate two employees, the client and a mobile hoist with space to manoeuvre a person in the hoist over the toilet and bath or into a shower area.

81. See **worksafe.vic.gov.au** for more information on designing workplaces for the safer handling of people.

Part 4 – Risk control measures

Altering the workplace environment

82. Environmental conditions include vibration, heat or cold, humidity, wind, flooring, surfaces and lighting. Altering these conditions can help control MSD risks.

Vibration

83. *Whole-body vibration* – the design of vibration damped equipment and engine mountings are the most effective methods of controlling vibration exposure. Other strategies to reduce exposure include:
- improving vehicle suspension and installation of operator seats mounted on suspension systems which incorporate spring and damper elements
 - ensuring that equipment implemented to reduce vibration is well maintained
 - ensuring employees adjust their seats appropriately and equipment is operated within the speed suggested by the manufacturer or to a speed that reduces vibration levels
 - training employees about the risk control measures that have been implemented and how they should be used.
84. *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.

Cold conditions

85. To control exposure to cold conditions (eg cool rooms, freezers, working outside in cold or wet weather):
- consider whether work can be done in an alternative environment
 - ensure employees take regular rest breaks in a warm place

- ensure employees wear non-slip footwear and clothing that is fitted and not too bulky or restrictive
- provide personal protective equipment suitable for the work (for example gloves to provide protection from the cold and also allow a good grip of the objects being handled).

Heat and humidity

86. For employees working in hot and humid conditions (eg laundries, foundries, kitchens), or working outside in hot weather consider:
- whether work can be relocated away from sources of heat
 - providing fans or air conditioning
 - using screens, awnings and clothing to shield employees from radiant heat sources such as ovens, furnaces and the sun
 - enclosing hot processes and increasing ventilation
 - altering work schedules so that work is done at cooler times or when the product is cooled
 - providing a cool, well ventilated area where employees can take regular rest breaks
 - ensuring employees work at a sensible pace
 - providing a supply of cool drinking water.

Windy conditions

87. Consider reducing the risk of exposure to windy conditions by:
- planning the route of work through protected pathways
 - using vehicles to transport items
 - co-ordinating work during low wind conditions.

Part 4 – Risk control measures

Floors and surfaces

88. Keeping work areas and sites clean, tidy and free of clutter, rubble or obstacles prevents employees from adopting awkward postures and reduces the level of exertion that may be required to reach over or around obstacles. Clean, smooth and flat surfaces can also reduce forces required to push and pull objects and prevent slips, trips and falls.

Lighting

89. 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 movable arm, where required
 - improve the layout of existing lights by lowering or raising them or changing their position in the work area
 - increase or decrease the number of lights
 - change the diffusers or reflectors on existing lights
 - change the lights to improve light levels or improve colour perception
 - 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
 - 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.

Altering the systems of work

Workload and pace of work

90. The workload and pace should accommodate the demands of the work. Where reasonably practicable, work should be organised to improve the flow of work by:
- having raw materials delivered, located or transferred mechanically to the location or work area where they will be used (for example building supplies can be delivered by truck or crane to the on-site location where they will be used or to the external lift, rather than being delivered to the front gate)
 - delivering materials, tools and items on mobile systems (for example, on wheeled cages)
 - processing and packaging items in the same location or on the same workbench
 - locating storage areas close to distribution areas
 - changing the distribution of work across the work day or week to avoid high peak workloads
 - where the distribution of work is unable to be changed, ensuring that there are adequate staff to accommodate the peak workloads
 - using systems that minimise the need for storage and multiple handling
 - asking suppliers to deliver products, items or tools in a way that allows them to be used without the need for additional handling (for example flat packs delivered on a vertical frame or table tops facing the right way up for use).

Part 4 – Risk control measures

91. Employees should not have to work at a rate that is at the limit of their ability. Before establishing a work rate, consult with the employees affected and their HSRs. Set realistic work rates by:
- allowing employees to control the pace for critical or physically demanding work
 - providing adjustability in the line speed (for example reduce the speed when conditions are altered, such as when new products are introduced or poor quality materials are used)
 - providing buffers to allow material to be taken off-line, for example, 'holding' bins or benches off the main processing conveyor (see Figure 39).



Figure 39 – Turntable for buffering products

92. Provide transition arrangements for employees undertaking unaccustomed work by:
- reducing the pace of work or workloads
 - providing more frequent breaks
 - job rotation.

Resources and support

93. When introducing risk control measures that involve plant, tools or equipment, consider whether:
- it is the right equipment for the work
 - there is sufficient equipment available
 - plant, tools and equipment are checked and maintained on a regular basis
 - time is allowed for operation and use
 - they do not introduce other hazards.
94. To allow for adequate recovery time and to reduce exposure to risks of MSD, arrange to have the right staffing levels, skill mix and shift arrangements. Consider:
- shift lengths
 - the levels of overtime
 - placement of rostered days off
 - the numbers of employees during peak periods.
95. Communicate and consult with employees about the way work is organised and allow employees to seek assistance from another person when necessary.

Altering the things used in the hazardous manual handling

96. When controlling MSD risk, employers need to think about the nature, shape, size, weight and number of the things used in the work. This may include the characteristics of the loads handled, tools and equipment used and the condition of the tools and equipment.

Part 4 – Risk control measures

Tools and equipment

97. Hand tools should be designed and selected to:
- be held in a neutral wrist or handshake position (see Figure 40)
 - 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 by either hand
 - provide a good grip surface
 - prevent an employee from adopting a pinch grip with high force or for prolonged periods.

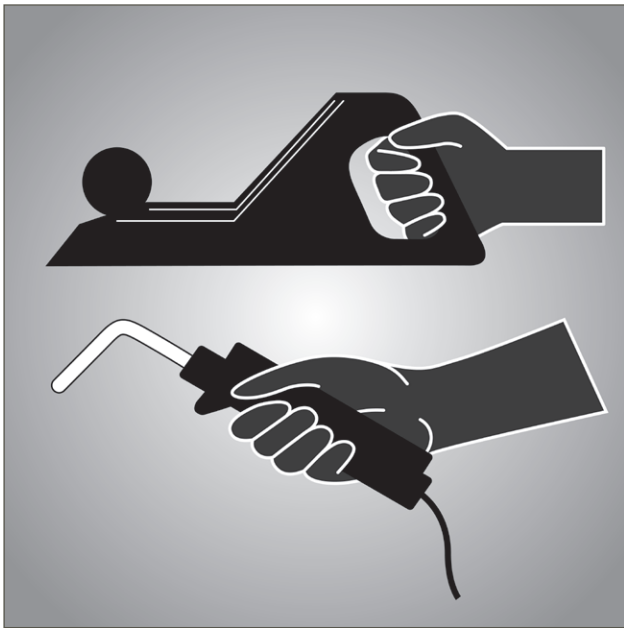


Figure 40 – Using tools with neutral wrist postures

98. Employers should minimise the level of muscular effort, particularly of the shoulder and wrist, needed to use hand tools by:
- using power tools where possible
 - suspending or supporting heavy tools where they are used repetitively and in the same place (see Figure 41)
 - counterbalancing heavy tools that are used repetitively and need to be kept away from the body
 - using trigger locks where the grip has to be sustained for more than 30 seconds
 - holding the work piece in place with either jigs or fixtures
 - selecting tools that produce the least amount of vibration
 - reducing impact shocks
 - limiting torque or 'kick back' reactions
 - providing adequate recovery times following prolonged use.

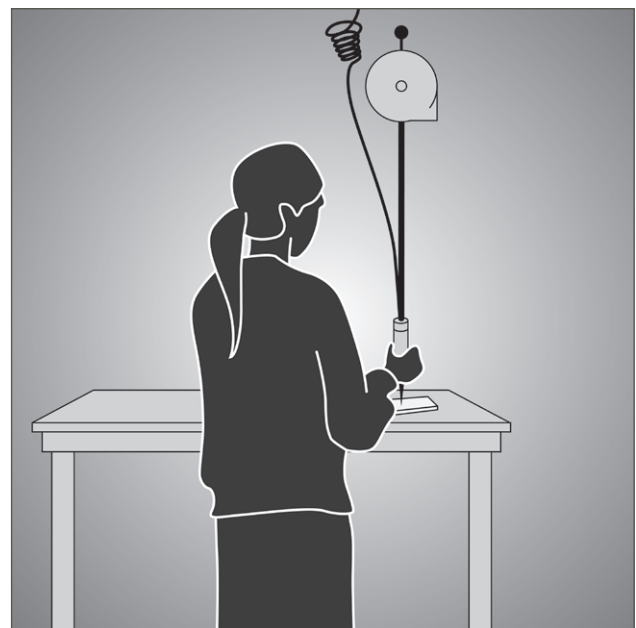


Figure 41 – Tool balancer supporting hand tool

Part 4 – Risk control measures

Maintenance

99. Tools and equipment need to be well maintained by carrying out regular inspections and servicing in accordance with the manufacturer's specifications. Poorly maintained or irregularly serviced tools and equipment may increase the effort needed to use them. For example, an unsharpened knife will increase the force required to bone and slice meat.

Handling loads

100. Examples of risk control measures that should be considered when handling loads include:
- purchasing products in smaller loads for manual handling or shifting larger loads mechanically
 - reducing the size or capacity of containers
 - using handles or suction pads to move loads such as sheet materials
 - using grip devices adapted to the particular object to be carried.

Pushing and pulling loads

101. Pushing loads is preferable to pulling because it involves less work by the muscles of the lower back and allows maximum use of body weight. It also requires a less awkward posture and allows employees to adopt a forward-facing posture, which provides better vision in the direction of travel.
102. Employers should reduce the effort required to start the load in motion by:
- using motorised push/pull equipment such as tugs, bed movers or electric pallet jacks
 - using a hovermatt or slide sheets to reduce friction when moving patients
 - positioning trolleys with wheels in the direction of travel

- encouraging employees to use leg muscles and whole body momentum to initiate the push or pull of a load.

103. Employers should reduce the effort to keep the load moving by:

- using motorised hand trucks and trolleys that are as lightly constructed as possible and have large wheels or castors that are sized correctly and roll freely
- using hand trucks or trolleys that have vertical handles, or handles at a height of approximately one metre
- ensuring that hand trucks and trolleys are well maintained
- treating surfaces to reduce resistance when sliding loads
- for pushing, ensuring handles allow the hands to be positioned just above waist height and with elbows bent close to the body
- for pulling, ensuring handles allow the hands to be positioned just below waist height allowing employees to adopt a standing position rather than being seated so the whole body can be used.

104. Employers should reduce the effort needed to stop a load by:

- indicating the place where loads are delivered
- planning the flow of work
- encouraging employees to slow the load down gradually
- fitting brakes and speed limiters so speed can be controlled, particularly if it is necessary to stop quickly to avoid other traffic.

Part 4 – Risk control measures

Weight Limits

This Code does not prescribe weight limits because whether work involves hazardous manual handling does not depend solely on the weight of the load. It also depends on the postures, movements and forces involved in the work (which may be affected by the weight of the load) and the frequency and duration of the work. For more information to assist in assessing posture, movements and forces associated with manual handling work, see **Appendix F**.

While lifting a heavy object is generally more likely to require high force, even a relatively small weight may be difficult to lift and require the application of high force depending on the circumstance. This is illustrated by the examples below.

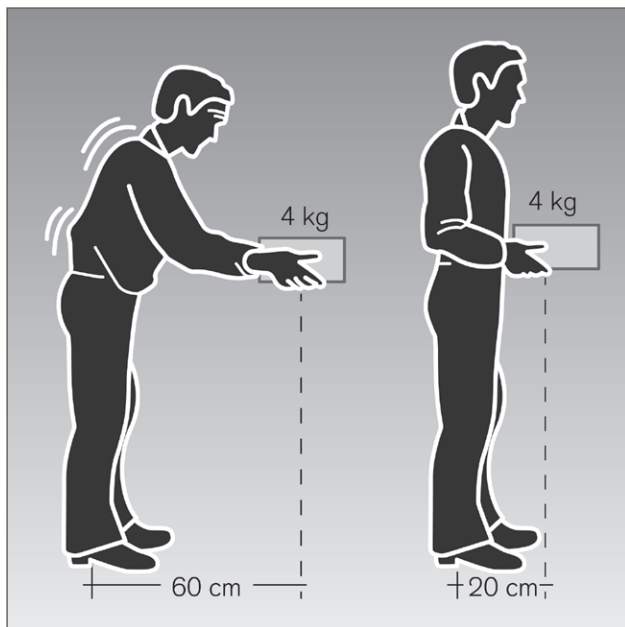


Figure 42 – Handling a load away from the body requires more effort

It takes about three times the effort to lift a 4kg load held 60cm in front of the body than it does to lift the same load 20cm in front of the body.

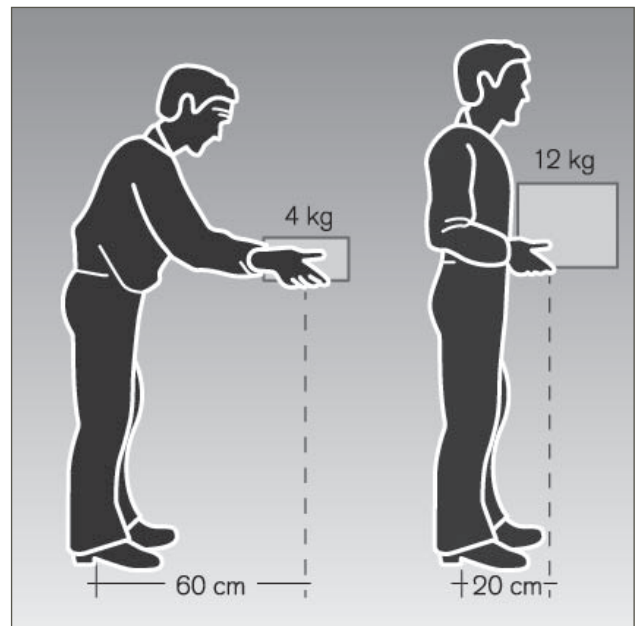


Figure 43 – Handling these loads of different weights requires similar effort

Lifting a 4kg load held 60cm in front of the body requires about the same effort as lifting a 12kg load held 20cm in front of the body.

Note: When identifying work that involves lifting, lowering or carrying heavy loads, as a general rule the bigger, heavier and bulkier the load, the greater the effort required to handle it and the greater the risk. In addition, risk is increased by the distance the load is held away from the body, the distance the load is lifted or lowered and the frequency and duration of these activities. Lifting or carrying a load with one hand or to one side also puts more stress on the body than handling the load with both hands.

Part 4 – Risk control measures

Using mechanical aids

105. Mechanical equipment can help control the risk of MSDs in relation to, for example, lifting carrying or supporting items, animals or people. A wide range of mechanical aids are available for various industries, including:

- conveyors such as roller conveyors, elevating conveyors, belt conveyors, screw conveyors, chutes, monorails or trolley conveyors
- cranes such as overhead travelling cranes, gantry cranes or jib cranes, stacker cranes, industrial manipulators and articulating arms
- overhead tracking/ceiling hoists
- lifting hoists (see Figure 44)
- loading dock levellers
- turntables
- springs or gas struts, mechanical devices such as hand winches, hydraulic pumps, and battery powered motors
- forklifts, platform trucks, tractor-trailer trains, tugs and pallet trucks
- lift tables, mechanical and hand stackers, lift trolleys, two-wheel elevating hand trucks, and vacuum or magnet assisted lifters (see Figure 45)
- glass panel, duct and plaster lifters.



Figure 44 – A mobile hoist reduces the forces required to transfer a patient



Figure 45 – A vacuum lifter reduces the need to bend and lift when palletising

Part 4 – Risk control measures



Figure 46 – A self-adjusting base in the laundry tub reduces the need for bending and twisting during unloading

106. Mechanical aids should be:

- designed to suit the load and the work being done
- as light as their function will allow
- adjustable to accommodate the work being done (see Figure 46)
- easy to use
- suited to the environment in which the work is performed
- located close to the work area so they are readily available but do not cause an obstruction
- supported by a maintenance program to ensure they are safe and that the required effort to use them is kept at the lowest possible level
- introduced with suitable instruction and training in their use.

107. When a mechanical aid is introduced into the workplace, employers must provide employees with any necessary information, instruction, training and supervision to enable them to perform their work in a way that is safe and without risks to health. For example, employers must control any risks to health and safety introduced by a mechanical aid, such as a forklift operated in the same workspace used by other employees. [OHS Act s21](#)

Using information, instruction or training

108. If it is not reasonably practicable to eliminate or reduce the risk of MSD by making changes to the workplace or work, or a risk still remains after implementing control measures so far as is reasonably practicable, employers must reduce the risk by providing employees with information, instruction or training. [OHS Regulations r27\(3\)](#) For example, an employer may reduce the risk by training employees on how to carry out team handling safely or by providing employees with information on job rotation.

Note: This section relates to information, instruction and training required by the OHS Regulations. It is provided in addition to the information in Part 1 (see page 7) on information, instruction, training and supervision required by the OHS Act.

109. Often information, instruction and training is used by employers to supplement higher level risk control measures. However, an employer can only rely solely on providing information, instruction or training to control a risk of MSD associated with hazardous manual handling if higher level risk control measures are not reasonably practicable (see Table 4 on page 24). [OHS Regulations r27\(4\)](#)

Part 4 – Risk control measures

Team handling

110. Team handling is manual handling of a load by two or more employees. Team handling brings its own risks and requires coordination. It 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.
111. Whenever team handling is used, it is essential to match employees, taking into consideration height and physical strength, and coordinate and carefully plan the lift. Employers need to ensure that:
- the number of employees in the team is in proportion to the weight of the load and the difficulty of the lift
 - one person is appointed to plan and take charge of the operation
 - enough space is available for the handlers to manoeuvre as a group
 - team members are of similar height and capability, where possible
 - team members know their responsibilities during the lift
 - training in team lifting has been provided and the lift rehearsed
 - aids to assist with handling (eg stretcher, slings, straps, lifting bars, lifting tongs, trolleys, hoists) are used where possible and training is provided in their use.

Job rotation

112. Job rotation involves moving employees for set periods of time through a variety of work that requires different postures, movements and forces. Job rotation requires the work to be sufficiently different to ensure that different muscle groups are used in different ways so that they have a chance to recover.

While it can reduce exposure time, it does not address the source of the risk.

113. Job rotation should only be used as an interim measure while implementing other risk control measures, or when trialling other control measures. See [worksafe.vic.gov.au](https://www.worksafe.vic.gov.au) for more information about job rotation and its limitations.

Applying the hierarchy of control

114. As outlined in paragraph 58, employers must work their way down the hierarchy of control until the risk of MSD is eliminated or reduced, so far as is reasonably practicable. The examples provided in paragraphs 118 and 119 list risk control measures, from the highest to lowest level of controls, that employers may use to control the risk of MSD associated with handling people or live animals.

Handling people

115. Employers need to ensure employees do not fully lift a person (other than a small infant) unaided (eg without assistance from mechanical aids, assistive devices or another employee). All people handling activities are a potential source of injury and the risks associated with this hazardous manual handling must be eliminated or reduced so far as is reasonably practicable. [OHS Regulations r27](#)
116. With people handling, the person being handled also needs to be considered. Employers must ensure the person is not exposed to any risk to their health and safety because of the way the lifting activity is undertaken. [OHS Act s23](#) The physical condition of the person being handled as well as their non-physical characteristics (eg their ability to understand and communicate, and their behaviour) may affect how the people handling activity is undertaken and the risks involved.

Appendix C – Discomfort survey

A discomfort survey can help identify work involving hazardous manual handling and work that may require risk control measures, or a review of existing control measures.

This survey sheet may help employers identify and record instances where employees experience discomfort that persists, re-occurs the next day, or persists after rostered days off.

Name (optional): _____

Date: _____

Job work location: _____

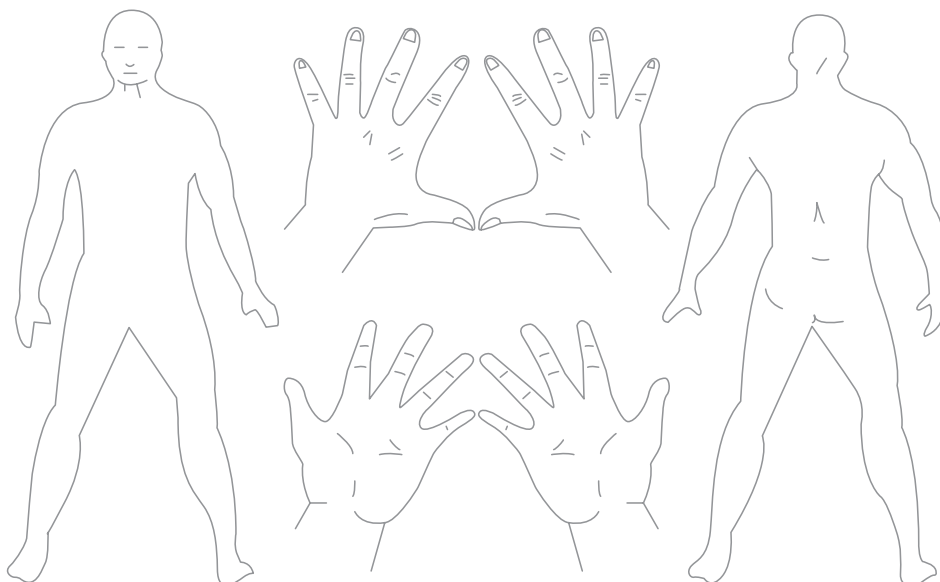
Manual work involved: _____

Time on this job: ☐ Less than 3 months ☐ 3 months to 1 year ☐ 1 to 5 years

Supervisor: _____

1. Do you suffer from swelling, numbness, tingling, 'pins and needles', stiffness or aches or pains in any part of the body?

Indicate on the diagrams where the problem occurs.



Appendix C – Discomfort survey

2. Rate the level of discomfort/pain on a scale of 1 to 5

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
Just noticeable / Moderate / Unbearable

3. During the last week, how often did you experience discomfort or pain?

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
Never 1–2 times 3–4 times 4–5 times Several times per day

4. What do you think caused the problem?

5. Proposed control/idea? *(optional)*
