



DRAFT

Code of Practice

HAZARDOUS MANUAL TASKS



safe work australia

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FOREWORD

This Code of Practice on how to identify hazardous manual tasks and control the risks of workers being affected by musculoskeletal disorders is an approved code of practice under section 274 of the *Work Health and Safety Act*.

An approved code of practice is a practical guide to achieving the standards of health, safety and welfare required under the *Work Health and Safety Act* (the WHS Act) and the Work Health and Safety Regulations (the Regulations).

A code of practice applies to anyone who has a duty of care in the circumstances described in the code. In most cases, following an approved code of practice would achieve compliance with the health and safety duties in the WHS Act, in relation to the subject matter of the code. Like regulations, codes of practice deal with particular issues and do not cover all hazards or risks which may arise. The health and safety duties require duty holders to consider all risks associated with work, not only those for which regulations and codes of practice exist.

Codes of practice are admissible in court proceedings under the WHS Act and Regulations. Courts may regard a code of practice as evidence of what is known about a hazard, risk or control and may rely on the code in determining what is reasonably practicable in the circumstances to which the code relates.

The WHS Act and Regulations may be complied with by following another method, such as a technical or an industry standard, if it provides an equivalent or higher standard of work health and safety than the code.

An inspector may refer to an approved code of practice when issuing an improvement or prohibition notice.

This Code of Practice has been developed by Safe Work Australia as a model code of practice under the Council of Australian Governments' *Inter-Governmental Agreement for Regulatory and Operational Reform in Occupational Health and Safety* for adoption by the Commonwealth, state and territory governments.

A draft of this Code of Practice was released for public consultation on 7 December 2010 and was endorsed by the Workplace Relations Ministers Council on [to be completed].

How to use this code of practice

This Code includes references to both mandatory and non-mandatory actions. The references to legal requirements contained in the WHS Act and regulations (highlighted in text boxes in this Code) are not exhaustive and are included for context only.

The words 'must', 'requires' or 'mandatory' indicate that legal requirements exist, which must be complied with.

The word 'should' indicates a recommended course of action, while 'may' indicates an optional course of action.

PURPOSE

This Code provides practical guidance for persons who have work health and safety duties under the WHS Act and Regulations on the how to eliminate or minimise the risk of musculoskeletal disorders arising from performing hazardous manual tasks in the workplace.

SCOPE

This Code applies to all types of work and all workplaces covered by the WHS Act and Regulations where manual tasks are carried out and is focussed on eliminating or minimising the risk of musculoskeletal disorders caused by hazardous manual tasks.

1. INTRODUCTION

1.1 Who should use this Code?

You should use this Code if you have duties to ensure health and safety under the WHS Act and its regulations as a person conducting a business or undertaking, whether you are an employer, self-employed, a principal contractor, a person with management or control of a workplace, a designer, manufacturer, importer or supplier.

This Code will help you work out the manual tasks in your workplace that could result in musculoskeletal disorders (MSDs) and show you how to eliminate or minimise these risks.

If you design, manufacture, import or supply plant or structures used for work, the guidance set out in this Code will help you ensure that users of your products are not exposed to the risk of MSDs.

This Code can also be used by other persons interested in reducing the risk of MSDs associated with hazardous manual tasks, such as workers and their health and safety representatives.

1.2 The meaning of key terms

Hazard means a situation or thing that has the potential to harm a person.

Manual task means a task requiring the person to use force to lift, lower, push, pull, carry or otherwise move, hold or restrain any person, animal or thing.

Manual tasks therefore cover a wide range of activities including stacking shelves, working on a conveyor line and entering data into a computer.

Hazardous manual tasks are tasks involving any of the following:

- repetitive or sustained force
- high or sudden force
- repetitive movement
- sustained and/or awkward posture
- exposure to vibration.

Musculoskeletal disorder (MSD) means an injury to, or a disease of, the musculoskeletal system, whether occurring suddenly or over a prolonged period of time. It does not include an injury (such as fractures and dislocations) caused by crushing, entrapment or cutting resulting from the mechanical operation of plant. MSD may include conditions such as:

- 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 or degeneration, including injuries to the shoulder, elbow, wrist, hip, knee, ankle, hands and feet
- nerve injuries or compression (e.g. carpal tunnel syndrome)
- muscular and vascular disorders as a result of hand-arm vibration
- soft tissue hernias, and
- chronic pain.

Risk control means taking action to first eliminate health and safety risks so far as is reasonably practicable, and if that is not possible, minimising the risks so far as is reasonably practicable. Eliminating a hazard will also eliminate any risks associated with that hazard.

1.3 What are the health and safety duties in relation to hazardous manual tasks?

Most jobs involve carrying out some type of manual task. Although not all manual tasks are hazardous, the most common workplace injuries across Australia are MSDs arising from manual tasks.

The WHS Regulations include specific obligations in relation to controlling the risks of MSDs, summarised below:

Duty holder	Responsibilities
A person conducting a business or undertaking	<ul style="list-style-type: none">• Must, so far as is reasonably practicable, identify all hazardous manual tasks performed at the workplace.• If it is not reasonably practicable to eliminate the risk of a worker being affected by a musculoskeletal disorder then the risk must be minimised as far as is reasonably practicable by:<ul style="list-style-type: none">○ changing the design of the work area and the layout of the workplace○ changing the systems of work○ changing the nature, size, weight of number of things used in performing the manual task○ providing mechanical aids○ changing the environment, or○ using a combination of these measures.• Provide information, instruction and training to minimise any remaining risk.• Review and revise risk control measures.

Deciding what is 'reasonably practicable' to protect people from harm requires weighing up certain matters, including the likelihood of a hazard or risk occurring and the degree of harm that would result, and then making a judgement about what is reasonable in the circumstances.

MSDs are often associated with the poor design and layout of the work area as well as the design of equipment, tools and processes used in manual tasks.

Designers, manufacturers, suppliers, importers and installers of plant, substances or structures that could be used for work must ensure, so far as is reasonably practicable, that the plant, substance or structure is without risks to health and safety. This duty includes eliminating or minimising the risk of MSDs associated with the product as far as is reasonably practicable and providing specific information to potential users about conditions required for safe handling.

If you are a designer, manufacturer, importer or supplier, you have an important role in ensuring the health and safety of workers because at some stage your products are likely to be handled or used during or as part of a manual task (see chapter 7 of this Code for further guidance).

1.4 What is involved in managing the risks associated with MSDs?

A step-by-step process

Identifying all hazards that can cause MSD and understanding the level of risk associated with those hazards will help you make the right decisions about what to do to eliminate or minimise the risks.

This process is known as *risk management* and involves the four steps set out in this Code:

- **identify** manual tasks that are hazardous

- **assess the risks** of MSDs associated with the hazardous manual task
- **control the risks** by implementing suitable control measures, and
- **review** the effectiveness of control measures.

Further guidance on the risk management process generally is available in the *Code of Practice: How to Manage Work Health and Safety Risks*.

Consulting your workers

The WHS Act requires that you consult, so far as is reasonably practicable, with workers who carry out work for you who are (or are likely to be) directly affected by a work health and safety matter.

If the workers are represented by a health and safety representative, the consultation must involve that representative.

Consultation involves sharing of information, giving workers a reasonable opportunity to express views and taking those views into account before making decisions on health and safety matters.

Consultation with your workers and their health and safety representatives is necessary at each step of the risk management process. Your workers know which tools and activities contribute to their discomfort and may have practical suggestions or potential solutions.

It is important to consult your workers as early as possible when planning to introduce new tasks, change existing tasks, select new equipment or carry out work in new environments. You should also encourage your workers to report problems with manual tasks and signs of discomfort immediately so that risks can be managed before an injury occurs.

Consulting, co-operating and co-ordinating activities with other duty holders

The WHS Act requires that you consult, co-operate and co-ordinate activities with all other persons who have a work health or safety duty in relation to the same matter, so far as is reasonably practicable.

Sometimes you may share responsibility for a health and safety matter with other business operators who are involved in the same activities or who share the same workplace.

If you share responsibility for health and safety with another duty holder, you must exchange information to find out who is doing what and work together in a co-operative and co-ordinated way so that all risks are eliminated or minimised as far as reasonably practicable.

For example, if you engage a contractor to perform work in your business and the work includes a hazardous manual task, you must discuss the risks associated with the work and what precautions will be taken with the contractor.

Further guidance on consultation is available in the *Code of Practice: How to consult on work health and safety matters*.

2. HOW MUSCULOSKELETAL DISORDERS OCCUR

Hazards that arise from manual tasks generally involve a complex interaction between a worker and:

- the work tasks and how they are performed
- the tools, equipment and objects handled, and
- the physical work environment.

A manual task becomes hazardous when it involves particular types of force, postures and movements. These factors (known as characteristics of a hazardous manual task) directly stress the body and can lead to injury.

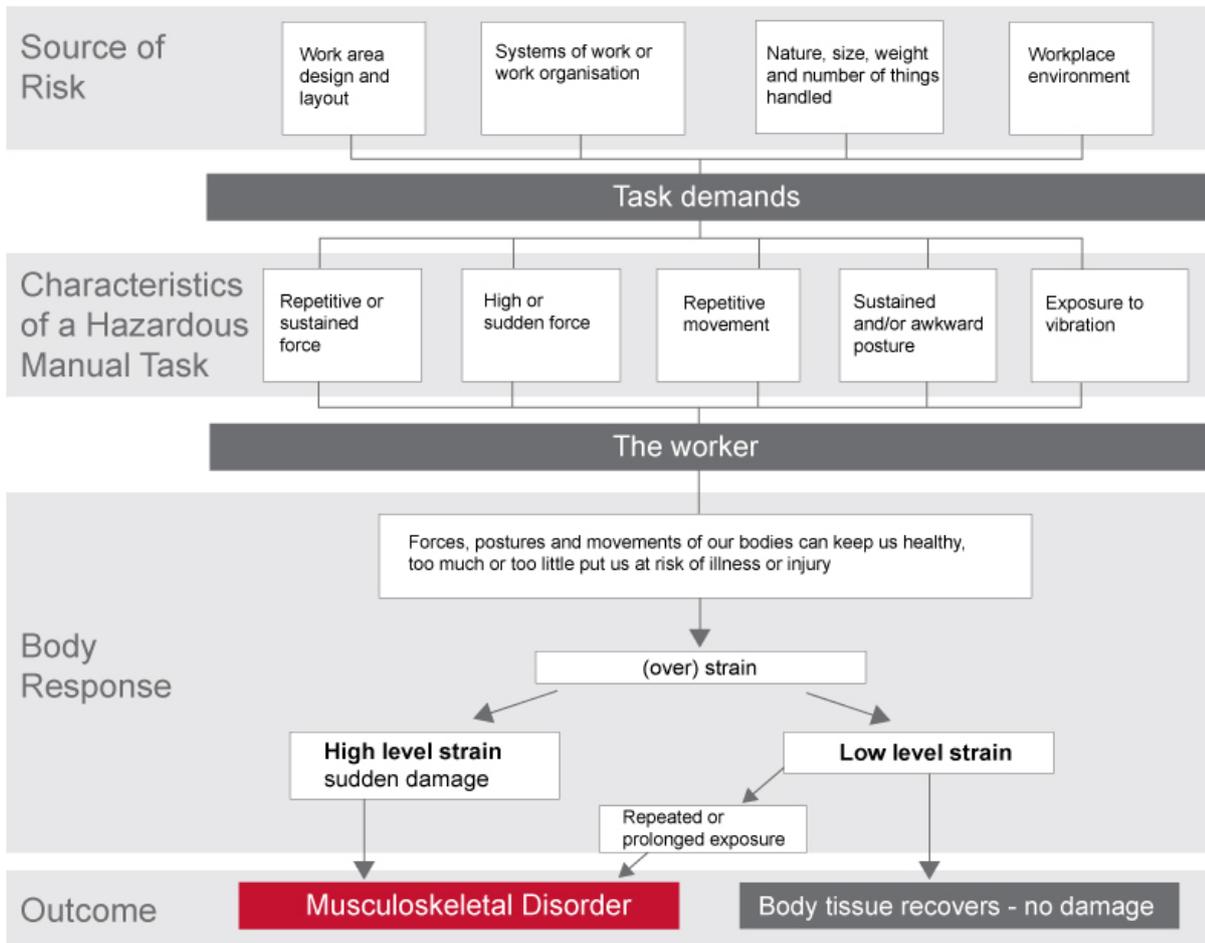
Injuries most commonly linked with hazardous manual tasks are MSDs, which occur in two ways:

- gradual wear and tear to joints, ligaments, muscles and inter-vertebral discs caused by frequent or prolonged periods of muscular effort associated with repeated or continuous use of the same body parts, including static body positions
- sudden damage caused by strenuous activity, or unexpected movements such as when loads being handled move or change position suddenly.

In order to control the risk of MSDs occurring, you need to understand the characteristics of a hazardous manual task, assess which specific forces, postures, movements, durations and frequencies are causing the risk of MSDs (the risk factors) and what in your workplace is causing them (the source of risk).

Figure 1 below illustrates the relationship between the sources of risk, the characteristics of a hazardous manual task and their effect on the body.

Figure 1: How musculoskeletal disorders occur



The following chapters explain how to identify hazardous manual tasks, how to assess whether they are likely to cause a MSD, and how to find the sources of those risks so that you can control them.

An overview of the risk management process for manual tasks is at *Appendix A*.

3. HOW TO IDENTIFY HAZARDOUS MANUAL TASKS

You must identify, so far as is reasonably practicable, which manual tasks are hazardous. The potential for a manual task to cause MSDs is not always obvious. Most MSDs are due to wear and tear in daily tasks. Although an injury could appear to be the result of an overload situation, the event that triggered the injury may have been the 'last straw' on already damaged tissues. This means that, in preventing MSDs, you need to look at all the relevant tasks your workers perform.

3.1 How to find hazardous manual tasks

Observe manual tasks

Looking at how people actually work and focussing on their postures and movements can help you identify any hazardous manual tasks. A manual task is hazardous if it involves any of the following characteristics (described in section 3.2):

- repetitive or sustained force
- high or sudden force
- repetitive movement
- sustained and/or awkward posture
- exposure to vibration.

Things to look out for include:

- any changes that have resulted in new manual tasks or a changed environment, and
- if workers have made improvisations to tasks to avoid discomfort (such as stacking mats or flattened cartons to stand on).

You can use the hazard identification worksheet in *Appendix B* to record your findings.

Consult your workers

Workers who perform manual tasks can provide valuable information about discomfort, muscular aches and pains that can signal potential hazards. For example, you could ask workers to identify tasks that:

- are difficult to do (or appear harder than they should be)
- are very tiring (muscle fatigue reduces work capacity)
- are awkward or dangerous (for example, difficulty controlling loads), and
- cause discomfort.

A discomfort survey that may be used is at *Appendix C*.

Review available information, including incident records

Information and advice about hazardous manual tasks and risks relevant to particular industries and work activities is available from regulators, industry associations, unions, technical specialists and safety consultants.

You should also check your records of workplace injuries and incidents, inspection reports and whether any workers compensation claims have been made for MSDs.

You may be able to identify trends or common problems from the information you collect. Trends may show that certain tasks have more characteristics that make them hazardous or that some characteristics are more common in certain jobs. Trends may also show that workers in a particular location are exposed to more hazardous manual tasks than in other areas and this could indicate a problem with the design and layout of that work area or the way work is carried out there.

These trends will help in deciding which manual tasks you should address as a priority.

3.2 Characteristics of Hazardous Manual Tasks

Force

Force is the amount of muscular effort required to perform a movement or task. Forceful muscular exertions place high loads on the muscles, tendons, joints and discs and are associated with most MSDs.

Repetitive force

Repetitive application of force means using force repeatedly over a period of time to move or support a thing. For example:

- lifting and stacking goods onto a pallet
- gripping and handling bricks when bricklaying
- using a nail gun to fix palings to a fence
- pressing a pedal or button to operate a power press
- typing and other keyboard tasks
- repetitively pressing components with the thumbs or other part of the hand to assemble an item
- prolonged application of therapeutic massage treatments, and
- removing splinting material from patients using shears.



Handling bricks and a trowel while bricklaying requires the repetitive application of force.

Sustained force

Sustained application of force occurs when force is applied continually over a period of time. For example:

- pushing or pulling a trolley around hospital wards
- holding down a trigger to operate a power tool
- supporting a plaster sheet while fixing it to a ceiling
- supporting, positioning or stabilising a patient's limb during surgery or when applying splinting or casting material, and
- continuing to hold a tool when not using it.



Pushing the wheelbarrow across the plank requires the sustained application of force.



Shearing requires sustained application of high force to restrain the sheep.

High force

High force may be exerted by the back, arm or leg muscles or by the hands and fingers. High force occurs in any tasks that:

- workers describe as very demanding physically
- workers need help to do because of the effort it requires, or
- require a stronger person or two persons to do the task.

Examples of the application of high force include:

- lifting or carrying a heavy object
- lifting an object which cannot be positioned close to the body
- pushing or pulling an object that is hard to move or stop
- restraining a person or animal, and
- lifting a heavy item from or onto a high shelf.



Using a concrete saw requires application of high force on the back and neck.



A heavily loaded trolley demands high force to move and steer it.



Using tin snips can require the application of high force.

Examples of high force using the hands and fingers include:

- using a finger-grip, a pinch-grip or an open-handed grip to handle a heavy or large load
- operating hand tools with tight squeeze grips, and
- gripping small instruments with high force, for example, a dental hygienist cleaning teeth.

Sudden force

Tasks where force is applied suddenly and with speed also generates high force. Rapid or sudden speed changes caused by jerky or unexpected movements while handling an item or load are particularly hazardous because the body must suddenly adapt to the changing force.

Examples of a sudden force include:

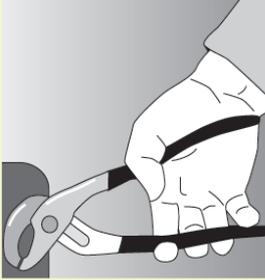
- impact recoil of a large nail gun
- pulling tangled laundry from an industrial washing machine or dryer
- removing tamper proof lids from bottles during medication rounds
- picking fruit, where a sudden twist and flick movement of the wrist is required to detach it from the branch
- throwing objects such as fleeces for wool classing, or sheets during bed making
- catching objects, such as when bricks are thrown from lower levels to the working position, or catching items retrieved from high shelves
- cutting reinforcement steel to size on a construction site with large bolt cutters
- attempting to catch an elderly patient who suddenly falls to the floor during assisted walking
- carrying an unstable load such as bagged stock feed pellets which suddenly moves to one side
- pulling large animals which are frightened or resistant out of a stock carrier
- handling patients who suddenly resist or no longer assist during the handling procedure, for example, repositioning a dementia patient, and
- team handling a large cement mixer onto the back of a truck or utility when one handler is suddenly unable to maintain the load during the lift.

Movement

Repetitive movement

Repetitive movement means using the same parts of the body to repeat similar movements over a period of time. Examples of tasks involving repetitive movement include:

- painting
- lifting goods from a conveyor belt and packing them in a carton
- typing and other keyboard tasks
- repeatedly reaching for and assembling components in electronics manufacturing, and
- using a socket and ratchet or spanner to unscrew long bolts.



Repetitive movements of the fingers are required to open pliers because the tool has no return spring.



Packing bottles from a fast moving process line.

Posture

Sustained posture

A sustained posture is one where part of or the whole body is kept in the same position for a prolonged period. Examples of sustained postures include:

- supporting plasterboard sheeting while it is nailed into place, and
- continually standing with weight mainly on one leg while operating a power press with foot pedal controls.

Awkward posture

An awkward posture is one in which any part of the body is in an uncomfortable or unnatural position, such as:

- postures that are unbalanced or asymmetrical, or
- postures that require extreme joint angles or bending and twisting.

Examples of awkward postures include:

- squatting while servicing plant or a vehicle
- working with arms overhead
- bending over a desk or table
- using a hand tool which causes the wrist to be bent to the side

- kneeling while trowelling concrete or laying carpet, and
- bending the neck or back to the side to see around bulky items pushed on a trolley.



Pruning pot plants can involve sustained awkward posture (bending the back) and the repetitive application of force (using shears)

An ideal posture is one where the trunk and head are upright and forward facing, the arms are by the side of the body, the forearms are either hanging straight or at right angles to the upper arm, and the hand is in the handshake position.

Postures that are both awkward and sustained are particularly hazardous.

Vibration

A worker may be exposed to vibration in the workplace through contact with various types of objects such as powered tools, vibrating machines and operating mobile plant. There are two common forms of vibration according to contact points between the body and the source:

Whole body vibration occurs when vibration is transmitted through the whole body, usually via a supporting surface, such as a seat or the floor in heavy vehicles or machinery. This may result in lower back pain, degeneration of the lumbar vertebrae and disc herniation. It can also cause other health effects, such as digestive system problems, increased heart rate, interference with hearing and motion sickness.

Hand-arm vibration usually occurs when vibration is transferred through a vibrating tool, steering wheel or controls in heavy machinery to the hand and arm. This can disrupt blood circulation in the hand and forearm and damage nerves and tendons. Localised vibration contributes to 'vibration-induced white finger' and 'carpal tunnel syndrome' through the gripping force needed to hold the vibrating tools (the tighter the grip, the more vibration is absorbed) and the repetitive shock loads of some tools.

Examples of hand-arm vibration include:

- using impact wrenches, chainsaws, jackhammers, grinders, drills or vibrating compacting plates
- controlling a steering wheel of a heavy earth moving machinery, and
- using needle guns in de-rusting metal.



The use of impact wrenches involves exposure to sustained hand-arm vibration.



The use of chainsaws involves exposure to sustained hand-arm vibration.



Operating equipment such as ride-on mowers may expose the worker to whole body and sustained hand-arm vibration. This may occur as vibration can be transmitted through the controls of the equipment.

4. HOW TO ASSESS RISKS

A risk assessment involves examining the characteristics of the hazardous manual task in more detail to assess whether the forces, movements and postures are undertaken in such a way that they give rise to the risk of MSDs.

4.1 When should a risk assessment be conducted?

You should carry out a risk assessment for any manual tasks that you have identified as being hazardous, unless you already know what the level of risk is, what is causing the risk and how to control it. A risk assessment can help you determine:

- which postures, movements and forces of the task pose a risk
- where during the task they pose a risk
- why they are occurring, and
- what needs to be fixed.

Assessing similar tasks

If a number of your workers carry out very similar hazardous manual tasks, you may assess these tasks together as a group, instead of assessing each task individually. However, you should only do a group risk assessment if all the tasks are sufficiently similar and do not expose a worker to a different risk than if individual assessments were carried out.

4.2 How to do a risk assessment for hazardous manual tasks

Breaking the task down into separate steps allows you to identify the risk factors for each step. For example, the task of putting stationery items away in a storage cabinet might involve the following steps:

- Collecting boxes of stationery supplies from the delivery dock
- Transporting stationery supplies to the storage area
- Unpacking boxes of stationery supplies
- Placing supplies on storage shelves

It may only be one part of the task that is a problem. When assessing each risk factor ensure that you have covered each step in the task. This will make it easier to identify what the exact problem is and then work out the best way to control it. Also, a complex task will be easier to assess if you cover each of the separate steps.

4.3 What are the risk factors?

The specific postures, movements and forces that you should look for are listed below and are known as risk factors, or the factors which give rise to the risk of MSD if they are performed repetitively, held or sustained for periods of time, combined with the duration of the task, or if the task involves high force.

Environmental factors such as heat and cold, and systems of work (or the way work is organised) such as a fast pace can also increase the risk.

To help you determine which postures, movements and forces of the task pose a risk, you should work through the following questions and record the information in the Risk Assessment and Control Worksheet at *Appendix D*.

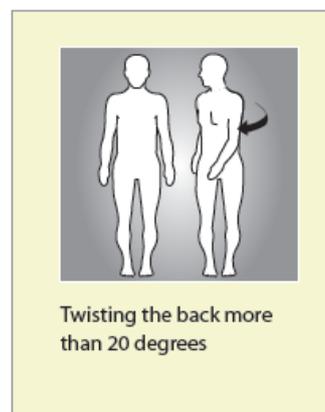
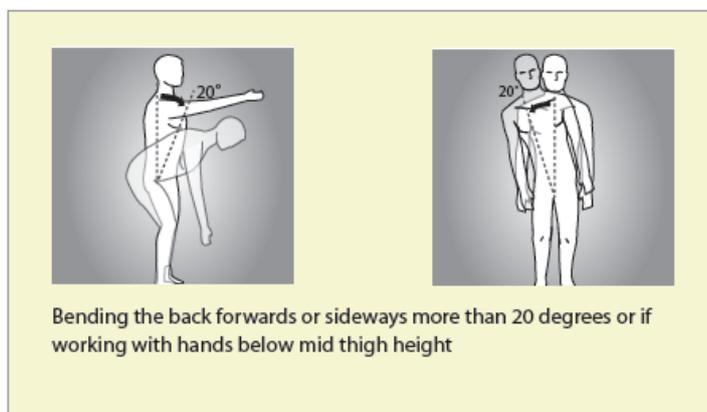
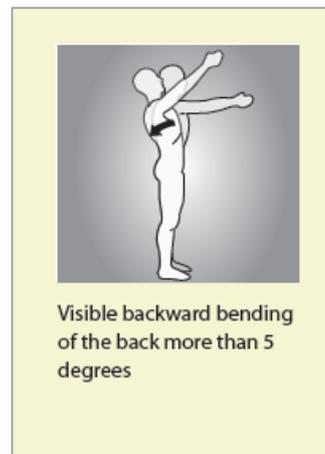
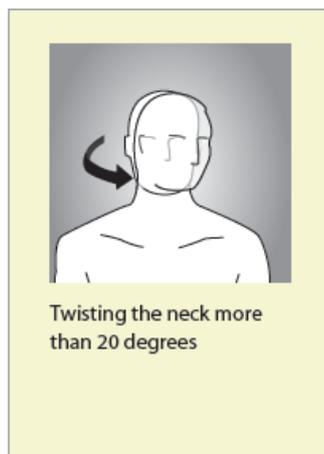
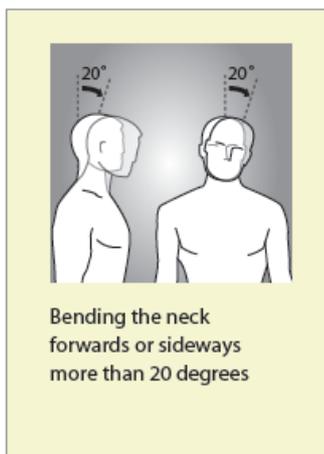
Question 1A: Does the task involve repetitive movement or sustained or awkward postures?

Different types of postures and movements can contribute to the risk of MSD if they are repetitive or sustained.

As a general guideline, 'repetitive' means that a movement or force is performed more than twice a minute and 'sustained' means a posture or force is held for more than 30 seconds at a time.

Postures and movements that pose a risk if they are repetitive or sustained:

- bending the back or head forwards or sideways more than 20 degrees
- bending the back or head backwards for more than 5 degrees or looking up
- twisting the back or neck more than 20 degrees
- working with one or both hands above shoulder height
- reaching forward or sideways more than 30cm from the body
- reaching behind the body
- standing with most of the body's weight on one leg
- twisting, turning, grabbing, picking or wringing actions with the fingers, hands or arms that includes excessive bending of the wrist
- working with the fingers close together or wide apart
- very fast movements
- squatting, kneeling, crawling, lying, semi-lying or jumping.





Working with one or both hands above shoulder height



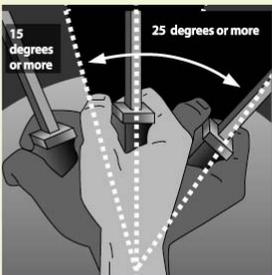
Reaching forwards or sideways more than 30 cm from the body



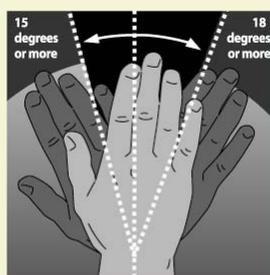
Reaching behind the body



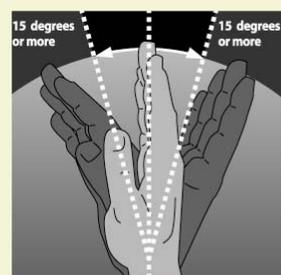
Squatting, kneeling, crawling, lying, semi-lying or jumping



Where the fingers are bent or applying higher forces (eg. gripping)



Bent wrists in actions where the fingers and hands are applying forces and fingers are fairly straight (eg. typing)



Where the wrist is bent to the side

Remember that as the degree of bending and twisting increases, the risk increases. The risk is greatest when the postures and movements are extreme, that is, toward the end of the movement range, and when they feel uncomfortable for the worker.

Question 1B: Does the task involve any repetitive or sustained forces?

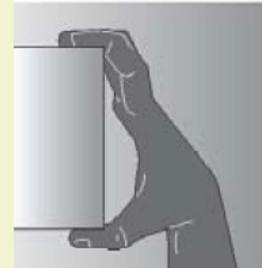
Tasks involving repetitive or sustained forces can contribute to MSDs. Generally, as the pace of work increases, movements become more repetitive and may be more forceful.

Tasks that pose a risk if they involve repetitive or sustained forces:

- lifting, lowering or carrying
- carrying with one hand or on one side of the body
- exerting force with one hand or one side of the body
- pushing, pulling or dragging
- gripping with the fingers pinched together or held wide apart
- holding supporting or restraining any thing, person or animal
- exerting force while in an awkward posture, for example:
 - supporting items while arms or shoulders are in an awkward posture
 - moving items while legs are in an awkward postures



Carrying with one hand or one side of the body



Gripping with the fingers pinched together or held wide apart



Pushing, pulling or dragging



Exerting force while in an awkward position. Holding, supporting or restraining any object, person, animal or tool.

Question 2: Does the task involve long duration?

The duration of the task is how long the task is carried out over a whole shift or continually at any time during a shift. Tasks which continue over a long period or are repeated over the work day increase the risk of injury, particularly if the tasks involve forceful exertions, repetitive movement, awkward or sustained postures and/or vibration. The duration of tasks can have a substantial effect on the likelihood of muscle fatigue.

If you have assessed a task as involving postures, movements or forces which are also repetitive (more than 2 per minute) and/or sustained (held for more than >30 seconds), you need to determine the duration of the task.

As a general guideline, long duration means the task is done for more than a total of 2 hours over a whole shift or continuously for more than 30 minutes at a time.

Question 3: Does the task involve high or sudden force?

High forces can cause MSDs even if they are not repetitive or sustained. This means that any task involving high force may be assessed as a risk, even if it is only done occasionally or for short periods. The longer and more often force is applied and the higher the force, the greater the risk.

The risk in tasks involving high force is related to:

- 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. The rapid or sudden speed changes caused by sudden or unexpected movements are high risk.
- Whether the force is jerky or sudden - forces abruptly applied or stopped can overload the muscles, tendons, joints, ligaments and vertebral discs. This can occur when throwing or catching loads, or when the load or item worked on moves unexpectedly (for example, when pulling up a fence post that suddenly comes free, or assisting and holding a walking patient who suddenly falls).

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



This sack of stock feed is heavy and floppy, making it difficult to handle. High force is needed to grip and move it.



The hitting action used to fit the hubcap involves high force. The risk is increased because the task is done while in an awkward posture.



Handling live animals may involve **sustained application of force, unexpected movements, the application of high force**, and the adoption of **sustained repetitive awkward postures** (reaching stooping and twisting of the back).

Question 4: Is there a risk?

After answering questions 1 to 4 above, you can determine whether the task is a risk. Remember that a task may involve more than one risk factor. Where a number of risk factors are present and interact within a task, the risk of MSD increases significantly.

The task involves a risk of MSD if you have answered 'yes' to either:

<ul style="list-style-type: none"> • Question 1 A <i>and</i> Question 2 • Question 1 B <i>and</i> Question 2 	<p>The task involves repetitive or sustained postures, movements or forces, <i>and</i> it involves long duration.</p>
<ul style="list-style-type: none"> • Question 3 	<p>The task involves high force or sudden force.</p>

Question 5: Are aspects of the work environment increasing the risk?

When you have determined there is a risk in the task, you should consider whether other factors are increasing the risk of MSD. Aspects of the environment such as heat and cold can increase risk by increasing the demands placed on the worker, affecting the function of muscles, nerves and blood vessels and increasing fatigue.

Vibration

Prolonged exposure to whole-body or hand-arm vibration increases the risk of MSDs and other health problems. The level of harm from vibration depends on a range of factors, including the characteristics of the vibration and how long and how frequently the worker is exposed.

Cold

Working in cold environments such as in cool rooms, freezers, cold stores or working outside in cold and/or wet weather can lower body and hand temperature and make handling and gripping objects more difficult. Increased grip force can also result from reduced sensitivity in cold hands. Cold can also significantly increase the risk of hand-arm vibration. Working in a cold environment requires thick or heavy protective clothing that restricts movement which can increase the risk of MSD. It can also cause overheating of the body as the clothing does not allow heat or sweat to dissipate and may decrease the blood flow to muscles, increasing fatigue.

Heat

Working in high temperatures (including radiant heat), for example, in foundries, laundries, bakeries, kitchens, or working in hot weather can make handling and gripping objects more difficult. Workers may have difficulty grasping objects due to perspiration on the hands or there may be sudden or unexpected forces due to loads slipping.

Humidity

Working in humid environments caused by processes such as steam cleaning, cooking or the weather can also increase the risk of developing MSD. Handling wet or damp objects may require increased force and humidity may also act to increase discomfort and fatigue.

Wind

Wind may increase the force required to handle items and reduce control while handling large objects (especially those that are flexible and with a large surface area). When working in windy conditions and in low temperatures that are also windy, the resultant wind chill may lower the body temperature further.

Question 6: Are systems of work increasing the risk?

Systems of work, or the way work is organised, can influence the physical and mental demands that a manual task places on a worker. These factors include situations where:

- the manual task places high physical demands on the worker
- the worker has no control over the work, and
- inadequate support and guidance is provided to the worker from supervisors, peers and management.

The fatigue and strain (physical and mental) that may arise from the above aspects of work bring on physiological responses such as increased muscular tension and affect the function of muscles, nerves and blood vessels, increasing the risk of the worker developing an MSD.

Workload and pace of work

Workload or pace of work may increase the risk of MSDs. For example, if your workers report:

- work demands a great deal of attention and concentration
- there is not enough time to finish their work
- they are regularly required to work overtime to complete the work
- difficulty keeping up the work rate
- their work is unevenly spread and piles up
- they work faster to meet deadlines, targets or quotas, or
- they are not taking scheduled rest breaks.

Ability to influence workload or work methods

Your workers are at greater risk of developing MSDs if they report:

- that they cannot control the pace of work, because the pace is set by a machine or production line
- they have no input in the amount of work they do
- they have little say in what tasks they do at work
- they cannot get a drink or go to the toilet when they choose

- they have no input in which days or times they are rostered to work, or the number of hours worked per shift, or
- the job is monotonous or lacks variety.

Level of resources and support

The level of resourcing or support available for the task may increase the risk of a MSD. For example, if your workers report:

- unsuitable or insufficient equipment to perform the task safely
- insufficient staffing levels or assistance when needed, or
- uncertainty about work roles or performance requirements.

4.4 What are the sources of the risk?

When conducting the assessment, think about the sources of any risks that are present in the task. For example, poor postures and movements may be due to the layout of the workplace, high forces may be due to the loads being handled, and the frequency and duration of the task may be due to the work organisation, limited staff numbers or increased work pace to meet tight deadlines.

The main sources of risk are:

- work area design and layout
- systems of work
- the nature, size, weight or number of things handled in performing the manual task, and
- the environment in which the manual task is performed.

You need to find the sources of risk for each of the risk factors assessed, because these will be the things that you may be able to change to eliminate or reduce the risk of MSD. For each risk factor, you should ask:

- where in the task are they occurring and,
- why each of these actions is occurring (source of the risk).

Once you know 'why' you are in a position to determine what to do to fix the source of the risk and hence control the risk of MSD.

Keep asking 'why' until you find all the sources of risk you can fix or you come to a dead end. Sometimes the answers come from outside the task assessed and may involve other tasks, so it is useful to follow the process that the task is part of through from start to finish.

Using the 'where' and 'why' approach above in conjunction with a Risk Assessment and Control Worksheet in *Appendix D* will help you determine the source of risk.

Work area design and layout

The workplace includes the work area (or workstation) where a particular job is based. It includes work benches, conveyors, furniture and fittings and the equipment used by workers doing that job. The positioning and relationship of the different elements in a work area to each other and to the worker are important because of the effect on working postures.

A work area that is designed without consideration of the risks that arise from hazardous manual tasks may impose awkward postures on workers undertaking manual tasks, for example, bent and twisted positions with shoulders raised and the need to reach for items over long distances.

Systems of work

The way work is organised and how tasks are performed may be a source of risk. You should consider:

- time constraints
- pace and flow of work across the working day or shift
- ability for workers to influence workload or work methods and changes in the workplace
- the level of resources and guidance
- consultation processes
- work roles and performance requirements or processes for dealing with conflicts, and
- staffing levels, skill mix and shift arrangements.

The nature, size, weight or number of things handled

Loads

Loads that have to be manually handled by workers can increase the potential for overexertion and fatigue through the amount of muscular effort needed to handle them.

Important factors include:

- size, shape and weight of load – loads which are large, bulky, or heavy and cannot be held close to the body or are asymmetric and put uneven forces on the spine
- loads that are difficult to grip through unsuitable handles or handholds or surface textures, and
- unstable or unwieldy loads can create sudden high muscle forces and result in overloading of muscles, tendons or discs.

The harder to grip and control a load, the greater the force required to handle it.

Tools, machinery and equipment

Tools that do not match the needs of the task can be a source of risk by increasing the force required, or by promoting sustained or awkward postures. Examples include a sander trigger without a lock-in mechanism which can result in the sustained application of force when the worker holds the trigger for long periods. Using a hand tool instead of a suitable power tool is likely to increase the force and effort needed to complete the task. Similarly, using a standard saw instead of a long handled saw that could more easily reach into tree branches, can result in sustained and repetitive awkward postures.

Weight – heavy hand tools, particularly if held for long periods of time, increase the force and effort required to perform a task, for example, a 3kg power drill used on an assembly line.

Balance – if the heaviest part of the tool is in front of the wrist, the force required to grip the tool and stop it tilting forward is increased.

Handle design – if the handle diameter is too large or too small, the grip span of the hand will create awkward postures and greater force will be required to control the tool. A handle that is too short or has prominent edges, can result in damaging compression of the palm.

Handle orientation – if the handle design does not place the wrist in a handshake position, the worker will need to use an awkward posture to operate the tool. Tools that cannot be adapted for use by both hands or are designed for right-handed use only can result in awkward postures and increased force.

Shock loading and impact – tools that deliver impacts such as hammers, hammer drills, and nail guns transmit impact forces to various ligaments and can require the use of a firmer grip to maintain control. They are a particular source of risk if used repetitively and for long periods.

Prolonged use – continued use of any hand tool (even tools that are well suited to the user and designed for the task) without adequate time to recover will increase risk of injury due to the sustained force to support it. In particular, vibrating tools increase risk.

Workplace environment

The sources of risk in the work environment include:

- very hot, cold, humid or windy conditions increase the demands placed on the worker, affecting the function of muscles, nerves and blood vessels and increasing fatigue
- vibration due to using some types of powered tools, vibrating machines and operating mobile plant
- slippery and uneven floor surfaces may increase the exertion required to perform manual tasks due to difficulty maintaining stability, and increased friction when moving objects such as trolleys
- obstructions related to poor housekeeping and cleaning can lead to awkward postures such as reaching or bending over obstacles, and
- low or high levels of lighting, as well as glare and reflection may lead to awkward or sustained postures to either improve vision or to avoid glare.

5. HOW TO CONTROL THE RISKS

Now you know **which** risk factors are present, **where** they are present and **why** they are present (sources of the risk), you are in a position to know **what** must be controlled and work out **how** to do it.

Under the [draft] WHS Regulations, you must eliminate the risk of injury or illness associated with manual tasks in your workplace, or, if this is not reasonably practicable, minimise the risks by:

- changing the design of the work area and the layout of the workplace where the hazardous manual task is carried out
- changing the systems of work used to perform the hazardous manual task
- changing the nature, size, weight or number of things involved in the performance of the hazardous manual task, including any thing to which the task relates and any plant or other thing used in performing the task
- providing mechanical aids to perform or assist in performing the hazardous manual task
- changing the environment in which the hazardous manual task is performed, or
- using any combination of the above measures.

If the above measures do not minimise the risk of MSDs, then the remaining risk must be minimised by providing information, instruction and training.

5.1 The hierarchy of control

The ways of controlling risks can be ranked from the highest level of protection and reliability to the lowest. This ranking is known as the hierarchy of control. You need to consider the various control options and choose the control that most effectively eliminates or minimises the risk in the circumstances. This may involve a single control measure or a combination of two or more different controls.

Level 1 control measures

The most effective control measure involves eliminating the hazard and its associated risk. Eliminating hazards and risks is usually easier and cheaper to achieve in the planning or design stage of a product, process or place used for work.

Level 2 control measures

If it is not reasonably practicable to eliminate the hazardous manual task, then you must minimise the risks by redesigning or modifying the source of risk, which may involve:

- changing the design or layout of the workplace
- changing the way the manual task is carried out through systems of work
- changing the things used in the manual task such as the equipment, machinery and loads handled
- providing mechanical aids, or
- changing the environment.

Level 3 control measures

These control measures rely on human behaviour and supervision, and used on their own, tend to be least effective in minimising risks. They include administrative control measures, such as job rotation, team handling, training and instruction on lifting techniques.

An effective risk control must not create new risks or hazards

5.2 Can the risk be eliminated?

Eliminating the hazardous manual task is the most effective way to prevent MSD. This is best achieved when workplaces, equipment, items to be handled and systems of work are being designed.

Plan, design and purchase to eliminate and minimise risks

When purchasing equipment for your business, such as tools, containers, workstations, machinery and vehicles, you should always check whether the item has been designed so that it can be used safely and best matches the needs of your workers. Where possible, you should:

- brief designers and engineers so that consideration can be given to the design implications on the manual tasks performed
- liaise with manufacturers and suppliers about handling, delivery and storage requirements, and
- purchase tools and equipment which are ergonomically designed and suitable for the work being carried out.

5.3 Can the design or layout of the work area be changed?

A well-designed work area lets workers work in an upright position, shoulders in a natural position (not elevated) and upper arms close to the trunk most of the time without large reaches to perform the task.

You should consider the following questions:

- Can the item be delivered to the workplace a different way?
- Can the work height be raised or lowered?
- Can the item be positioned at waist height?
- Can the reach distances be decreased?
- Can the part be re-orientated to be worked on?
- Is there adequate room to move and perform the work task?

Workstation design

Workstations should be designed to be adjustable for the widest range of workers possible. Adjustable work surfaces, work stands and table tops allow quick adjustment of work surface heights to meet the needs of a range of workers. They can also be quickly changed as workers change tasks, for example, when changing from working on large objects to working on small objects.

Where it is not possible to provide adjustable workstations then consider altering the design so:

- the workstation height suits widest range of physical characteristics of workers
- reaching distances suit shorter workers, and
- knee and leg clearances suit larger workers.

Working heights

Tasks with high visual demands need to be performed above elbow height and work surfaces may need to be tilted, for example, tasks involving delicate or precise manipulation.

Tasks where the hands make a narrow range of movements and can rest on the work surface should be performed at, or just above, elbow height. A sloping surface may reduce the muscle effort on the arms and shoulders during tasks that require hand-eye coordination, such as drafting.

Light manipulative tasks or tasks involving the use of a keyboard should be performed at just below elbow height.

Tasks incorporating a range of arm movements using the shoulder should be performed at between hip and shoulder height, for example, taking items from a stack and placing them on a conveyor.

Tasks requiring considerable muscle effort or use of the body for leverage, for example, drilling at a workbench, should be performed at hip height and no higher.

Where possible, place items used in manual tasks so they are:

- in front of the worker
- between waist and shoulder height
- close to the midline of workers and orientated towards the worker
- on the worker's preferred side
- positioned within comfortable reaching distance, and
- positioned to avoid double handling and to avoid moving loads manually over long distances.

Displays and controls should be positioned to encourage comfortable head and neck postures, comfortable hand and arm reach and efficient use. You should:

- place frequently used displays and controls, including keyboards and other input devices, directly in front of the worker
- position controls at comfortable elbow height
- select electronic or foot controls rather than hand controls if high force is required, and
- place pedals so that workers can operate them from a comfortable seated position.

Working position

Workers should not remain in a seated posture for prolonged periods. Design the work to provide opportunities for workers performing seated or standing tasks to vary their postures and movements

For seated tasks, seating can be important in minimising awkward postures. It should allow adjustment of the following features:

- the height and angle of the seat should be adjustable
- a contoured backrest with a lumbar curve except those where the backrest would interfere with the actions to be performed
- a swivel action to prevent the worker from twisting to reach workstation components
- seat width and depth should accommodate a wide range of users
- all edges should be rounded and the edge of the seat should not press into the thighs
- a five point base with casters to allow movement on carpet, and gliders fitted to the base for low resistance flooring, where access to work items located beyond normal reach is required, and
- a footrest or foot ring fitted on drafting or higher chairs to support the feet.

A seated work position is best for:

- work that requires fine manipulation, accurate control or placement of small objects
- light manual work
- close visual work that requires prolonged attention, and
- work that involves operating a foot pedal.

For standing tasks, you should:

- provide a chair, stool or support so that the worker can alternate between sitting and standing
- provide a footrest (large enough for the whole foot) to allow the worker to stand with either foot raised, and
- where possible, provide a suitable floor covering to cushion concrete and other hard floors.

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, and
- there is limited space.

Work space

When considering how much space is required to perform a task, you should consider the number of workers and other people involved in the task, any equipment that might be required and the space required to operate the equipment safely. For example, when observing workers of an aged care facility assisting an infirmed person to bathe, the bathroom may need to accommodate two workers, the client, a mobile hoist with space to manoeuvre a person in the hoist over the toilet and bath or into a shower area.

5.4 Can the system of work be changed?

You should consider the following questions:

- Can the work flow be changed?
- Can deadlines and peaks and troughs in the work be planned for and staffing altered accordingly?
- Can order deadlines for customers be changed to reduce overtime?
- Can staff scheduling be changed?
- Can jobs be made more meaningful by increasing task variety?
- Can part of the task be automated?
- Can the frequency of actions be altered?
- Can the duration of the task be altered?

Workload and pace of work

The workload and pace should accommodate the physical demands of the manual task. Where possible, you should organise work to minimise multiple handling and improve the flow of work by:

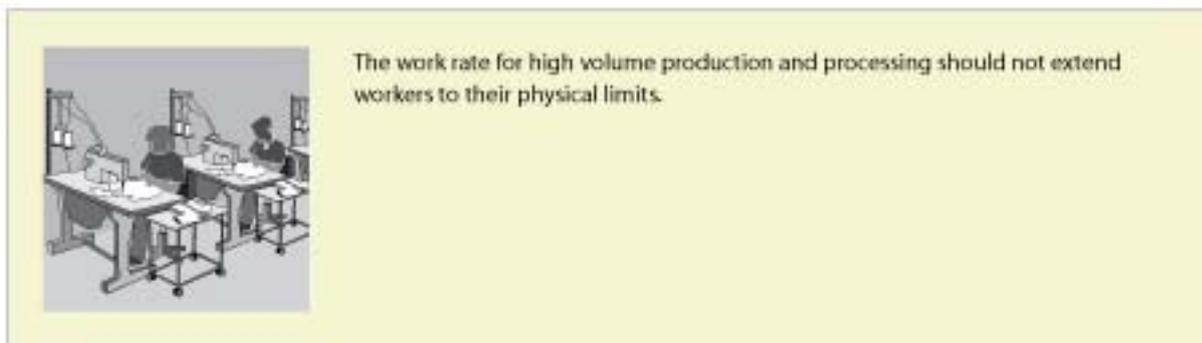
- having raw materials delivered, located or transferred mechanically to the location or work area where they will be used, for example, building supplies can be delivered by truck or crane to the on-site location where they will be used or to the external lift rather than being delivered to the front gate
- delivering materials, tools and items on mobile systems, for example, on roller pallets
- 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
- using systems which minimise the need for storage and additional handling, and
- 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.

Workers should not have to work at a rate that is at the limit of their ability. When you establish a work rate, you should consult with the workers affected and their health and safety representatives.

Set realistic work rates by:

- allowing workers to control the pace for critical or physically demanding tasks
- 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, and
- providing buffers to allow material to be taken off-line, for example, 'holding' bins or benches off the main processing conveyor.



Rest breaks

Regular rest breaks provide opportunities for workers to prevent the build up of, or recovery from the effects of, fatigue in muscle groups used during hazardous manual tasks that involve:

- repetitive awkward postures or sustained postures
- application of high force
- vibration
- long duration, and
- high levels of mental demand combined with hazardous manual tasks, for example, inspection work.

The frequency and the duration of rest breaks will be dependent on the nature of the task. Generally, the greater the force required, or the longer a posture sustained, the greater the recovery time.

More frequent and shorter rest breaks are better for rest and recovery than fewer, longer breaks. Build short breaks into task rotation arrangements where work is of a similar nature, for example, process production or hand tool use. Micro-pauses – very short intermittent breaks – in physical activity, are also beneficial. Build these into the design of tasks and methods of work, for example:

- workers put down hand tools or release them (suspension) between operations
- keyboard operators remove hands from keyboards during natural keying breaks

Resources and support

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 considering:

- shift lengths
- the levels of overtime
- placement of rostered days off, and
- the numbers of workers during peak periods

Communicate and consult with workers about the way work is organised and allow workers to seek assistance from another person when necessary.

5.5 Can the things used in the manual task be changed?

This may include:

- the load being handled and forces exerted (such as packages, containers, animals or people, controls or levers), and
- tools and equipment used to do the task (such as hand-tools).

You should consider the following questions:

- Can the thing be designed out of the work process?
- Can it be changed?
- Can it be smaller or lighter?
- Can the thing be brought into the workplace in a different form?

Handling loads

If your workers handle things that are delivered to your workplace, you should consider:

- purchasing products in smaller loads for manual handling or larger loads to be shifted mechanically
- reducing the size and/or shape of loads or capacity of containers in-house
- asking suppliers to deliver goods in sturdy boxes or containers with handles or handholds. If the box is made of cardboard, the area near the handhold should be reinforced so that it does not rip when the box is picked up
- providing handheld hooks or suction pads for loads such as sheet materials
- using grip devices adapted to the particular object to be carried
- asking suppliers to label loads to indicate any MSD risks, and where appropriate, any necessary precautions when handling the load
- ensuring the outside surface is not slippery, and
- arranging for hot or cold materials to be in insulated containers.



Use handling grip devices adapted to the particular object to be carried

Where possible:

- store commonly used items or frequently moved loads at knuckle height
- store light or infrequently used items above shoulder height or close to the floor, and
- provide an intermediate surface so the worker can rest the load if the object must be lifted from a low to a high position.

Handling people

No worker should fully lift a person, other than a small infant, unaided (that is without assistance from for example mechanical aids, assistive devices or another worker/s). All people handling activities are a potential source of injury and the risks associated with this hazardous manual task must be eliminated or minimised as far as is reasonably practicable.

With people handling the health and safety of the person being handled needs to be considered as well as the health and safety of the worker/s and others involved in the task. The physical condition of the person being handled as well as their non-physical characteristics, for example their ability to understand and communicate and their behaviour, will affect how the people handling activity is undertaken and the risks involved.

When people are being handled, the controls selected and applied should take into account all of the sources of risks. Controls may include any of the following:

- a mobility risk assessment: maximise the person's ability to move themselves through the use of appropriate advice, mechanical and/or assistive devices.
- moving the person to a place that does not constrain the movement of the worker performing the task, for example, when using a shower trolley to bathe a patient
- where handling is required, assessing the needs of the task including the specific type of mechanical aids, personnel needed and planning it in a manner that avoids the hazardous manual task
- where the use of hoist requires two or more people provide adequate supervision and resources to eliminate the risk of workers being under time pressure and attempting the task on their own
- if team lifting is required in emergency situations, ensure that the number of workers is in proportion to the weight of the load and the difficulty of the lift and that those lifting have been trained to team lift
- planning how to handle a person attached to medical or other equipment
- location and storage allows ready access to mechanical aids and assistive devices, and
- the training needed for safe use of mechanical aids and assistive devices.

Handling animals

Supporting or restraining animals should only be carried out by people with the necessary skills and experience. When animals are being handled consider the following:

- using mechanical devices or other restraining aids for lifting, transporting, or restraining animals
- moving the animal to a place that constrains or minimises the movement of the animal before commencing the task
- where handling is required, assessing the needs of the task including the specific type of mechanical aids, personnel and planning it in a manner that avoids double handling, and

- where the use of a mechanical aid or assistive device requires two or more people, minimising double-handling so workers under time pressure don't try to complete the task on their own.

Tools and equipment

Poor design and excessive use of hand tools are associated with chronic disorders of the hand wrist and forearm, e.g. carpal tunnel syndrome and wrist tendonitis. The primary purpose of controls for hand tools is to minimise the level of muscular effort including loading of the shoulder and wrist needed to use them.

Hand tools should be designed to:

- be held in a neutral wrist or handshake position
- allow the hand to retain a comfortable grip span
- be 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, and
- prevent a worker from adopting a pinch grip with high force or for prolonged periods.

Minimise the level of muscular effort, particularly of the shoulder and wrist, needed to use hand tools by:

- using power tools where possible
- suspending heavy tools where they are used repetitively and in the same place
- 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, and
- limiting torque or 'kick back' reactions.

Using balancers and other tool supports

Tools can be suspended from balancers or tool supports to reduce both the force needed to use them and the fatigue resulting from their repetitive and sustained use.

Well-designed balancers and tool supports counteract the effect of gravity, reduce the effort of holding or supporting the tool, and minimise sudden twisting forces on the hand and arm from the action of the tool. They also reduce the length of time the tool needs to be held.

Mounting the tool – for example, in a drill stand – will eliminate or reduce the need to hold the tool for long periods.

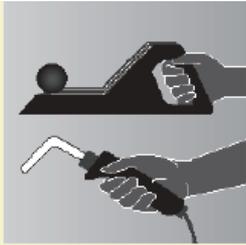
Maintenance and servicing

Poorly maintained tools and equipment can increase the risks associated with manual tasks. You should ensure that tools and equipment are well maintained by carrying out regular inspections and servicing in accordance with the manufacturer's specifications.

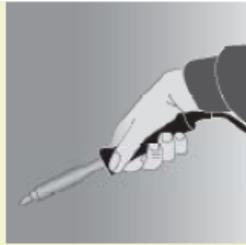
Purchasing specifications

You should consider the manual task implications when purchasing tools, equipment or supplies, for example how the supplies will be handled, how the equipment will be used or maintained. When purchasing items you should specify the uses or function of the plant and equipment and

what you require to reduce the risks from handling loads. Also check any vibration specifications and the need to accommodate a range of physical characteristics of workers.



Select tools that can be held with a neutral wrist or in a handshake position with the hand adopting a comfortable (not too open or too closed) grip. Orient jigs and fixtures holding the workpiece so that the wrist does not have to bend.



Excessive bending of the wrist is required to use this tool.



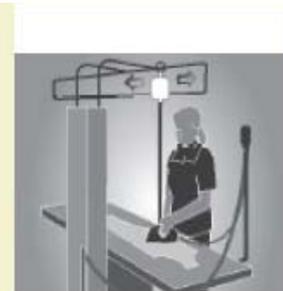
Modifying the tool eliminates the awkward wrist posture.



Select tools that are suited to the task, such as long handled saws when pruning trees.



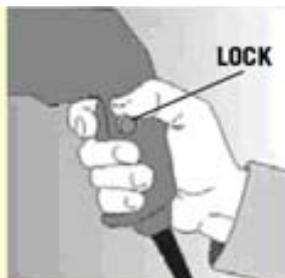
The heaviest part of this brush cutter is located behind the wrists and the weight is supported by a harness.



An overhead suspension system reduces the forces required to use the iron.



The diameter and finish of handles should allow a comfortable grip so that the hand can wrap around the handle.



Powered hand tools with no locking require sustained application of force on the trigger. A locking switch eliminates the need to maintain force on the trigger and allows a better grip.

5.6 Can mechanical aids be used?

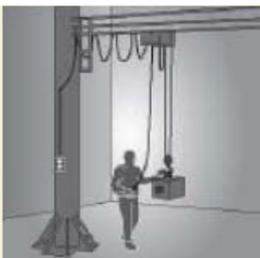
Mechanical equipment may eliminate or reduce the need for workers to lift, carry or support items, animals or people. A wide range of mechanical aids are available for various industries, for example:

- conveyors such as roller conveyors, elevating conveyors, belt conveyors, screw conveyors, chutes, monorails or trolley conveyors
- cranes and hoists such as overhead travelling cranes, gantry cranes or jib cranes, mobile or fixed hoists, stacker cranes, industrial manipulators and articulating arms
- loading dock levellers
- turntables
- springs or gas struts, mechanical devices such as hand winches, hydraulic pumps, and battery powered motors
- forklifts, platforms 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, and
- glass panel, duct and plaster lifters.

Mechanical aids should be:

- designed to suit the load and the work being done
- as light as their function will allow
- adjustable to accommodate a range of users
- easy to use
- suited to the environment in which the task 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, and
- introduced with suitable instruction and training in their use.

When you introduce a mechanical aid into the workplace, you must provide adequate information, instruction, training and supervision to ensure that new arrangements do not introduce any additional risks to workers, for example, a forklift operated in the same workspace used by other workers.



Using mechanical equipment, such as overhead cranes to lift and move very heavy objects eliminates the need to apply high force.



A vacuum operated lifting device can reduce the forces, awkward postures, and movements required to manually load products onto pallets.



A self-adjusting base in the laundry tubs reduces the need for bending, twisting and reaching during unloading.



Using a sling lifter to transfer a patient/resident.

Pushing and pulling loads

Pushing loads is preferable to pulling because it involves less work by the muscles of the lower back, allows maximum use of body weight, less awkward postures and generally allows workers to adopt a forward facing posture, providing better vision in the direction of travel.

Reduce the effort required to start the load in motion by:

- using motorised push/pull equipment such as tugs, electric pallet jacks
- positioning trolleys with wheels in the direction of travel, and
- using large power muscles of the legs and whole body momentum to initiate the push or pull of a load.

Reduce the effort to keep the load moving by:

- using hand trucks and trolleys that are as lightly constructed as possible, 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 1metre
- 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 above waist height and with elbows bent close to the body, and
- for pulling, ensuring handles allow the hands to be positioned below waist height allowing workers to adopt a standing position rather than being seated so the whole body can be used.

Reduce the effort needed to stop the load by:

- indicating the place where loads need to be delivered
- planning the flow of work
- encouraging workers to slow down gradually, and
- fitting brakes and speed limiters so speed can be controlled, particularly if there is a need to stop quickly so as to avoid other traffic.



A trolley can eliminate many of the risks involved in manual handling, however, the load will still need to be manoeuvred onto the trolley and through the workplace.

5.7 Can the work environment be changed?

You should consider the following questions:

- Can a warm area be provided?
- Can a cool area be provided?
- Can a regular housekeeping plan be implemented?
- Can the lighting be improved?
- Can relocation to a different area occur?

Vibration

You should consider eliminating or minimising exposure to whole-body and hand-arm vibration by controlling:

- vibration at the source
- the path of the vibration, and
- the vibration received by the worker.

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:

- design factors such as improving vehicle suspension and installation of operator seats mounted on suspension systems which incorporate spring and damper elements
- organisational factors such as ensuring that equipment and control measures implemented to reduce vibration are well maintained
- user factors such as ensuring workers adjust their seats appropriately and equipment is operated within the speed suggested by the manufacturer or to a speed that reduces vibration levels, and
- training workers about the risks associated with whole body vibration, the controls that have been implemented and how they should be used.

Hand arm vibration – substitute alternative manufacturing methods or process to eliminate the need for vibrating equipment. Where this is not possible the best strategy is to purchase tools and equipment which produces less vibration. The above strategies to reduce exposure should also be considered in relation to controlling the risks associated with vibrating tools and equipment eg design of tools and equipment, organisational factors such as purchasing and maintenance and training of workers.

Cold conditions

To control exposure to cold conditions you should:

- ensure your workers take regular rest breaks in a warm place
- ensure your workers wear non-slip footwear and clothing that is fitted and not too bulky or restrictive, and
- provide personal protective equipment suitable for the task (for example, gloves to provide protection from the cold and also allow a good grip of the objects being handled).

Heat and humidity

For workers in hot and humid conditions, reduce temperature and humidity during manual tasks where possible by:

- relocating work away from sources of heat
- providing fans or air conditioning
- using screens, awnings, and clothing to shield workers 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
- providing a cool, well-ventilated area where workers can take rest breaks
- ensuring that workers work at a sensible pace, and/or
- providing a supply of cool drinking water.

Windy conditions

Consider minimising the risk of exposure to windy conditions by:

- planning the route of work through protected pathways
- using vehicles to transport items in outdoor conditions, and
- co-ordinating tasks during low wind conditions.

Floors and surfaces

Keeping work areas clean, tidy and free of clutter or obstacles prevents workers 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

Select lighting to suit the task performed. You should consider the following lighting characteristics:

- illumination levels
- direction of lighting relative to the manual task
- reflection
- glare
- colour

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 louvers to reduce reflections, shadows and glare, and
- control natural light sources (particularly bright sunshine) on work pieces, screens and work surfaces by orientation and placement at 90 degrees to the source and/or by providing screening and louvers.

5.8 Can administrative control measures be used to reduce the risk?

Job rotation

Job rotation can be used to minimise the risk of MSDs by rotating staff between different tasks to increase task variety. However, job rotation does not address the risk factors or source of the risk, it only attempts to reduce risk by reducing *exposure* to those risk factors.

Job rotation requires the tasks to be sufficiently different to ensure that different muscle groups are used in different ways, so they have a chance to recover. To increase task variety, you should consider:

- combining two or more tasks so both are done by one worker and alter the workstation and items used accordingly, or
- providing short breaks doing another task when the job is monotonous.

Team handling

Team handling is manual handling of a load by two or more workers. Team handling brings its own risks and requires coordination. It should only be used as an interim control measure. You should redesign manual tasks to allow the use of mechanical equipment, or eliminate the need to lift, if there is a regular need for team handling. Team lifting can increase the risk of MSD if:

- the load is not shared equally
- workers do not exert force simultaneously
- individual workers need to make foot or hand adjustments to accommodate other team members, reducing the force each can exert
- performed on steps or on a slope where most of the weight will be borne by handlers at the lower end, or
- individual workers unexpectedly lose their grip, increasing or changing the balance of the load on other team members.

Whenever team handling is used, it is essential to match workers, co-ordinate and carefully plan the lift. You should ensure that:

- the number of workers 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, including what to do in case of an emergency, and

- aids to assist with handling (a stretcher, slings, straps, lifting bars, lifting tongs, trolleys, hoists) are used where possible and training is provided in their use.

Information, training and instruction

If a risk of MSDs remains after implementing higher level control measures, then the risk must be minimised by providing information, training and instruction. Training in lifting techniques must not be used as the sole or primary means to control the risk of MSDs.

5.9 Implementing control measures

Risk control may initially involve using short term, interim measures while a long term solution is developed. For example, temporarily raise the bench until it can be replaced or altered permanently or rotate employees through a production line to reduce the time spent working at a low bench until it can be changed.

To implement the most effective risk controls, you should:

- allow workers to trial solutions before decisions are made to make the solution permanent
- review controls after an initial testing period, as they may need modification
- develop work procedures to ensure that controls are understood and responsibilities are clear
- communicate the reasons for the change to workers and others
- provide training to ensure workers can implement the risk controls for the task competently, and
- ensure that any equipment used in the manual task is properly maintained.

You should not make final decisions on the effectiveness of the control measures that you have implemented until enough time has passed for your workers to adjust to the changes. Workers should be given a chance to practice using the new workstation, tool, mechanical device or new work method. Some modifications may require workers to use new muscle groups or different parts of the body and they may initially feel some discomfort. At this stage, you should frequently check with your workers how they feel the improvements are working.

Training

Training in the type of control measures implemented should be provided during induction into a new job and as part of an on-going manual task risk control program. Training should be provided to:

- workers required to carry out, supervise or manage hazardous manual tasks
- in-house designers, engineers and officers responsible for the selection and maintenance of plant and/or the design and organisation of the job/task, and
- any health and safety representatives.

The training should include information on:

- manual task risk management including the characteristics of hazardous manual tasks
- specific manual task risks and the measures in place to control them
- how to perform manual tasks safely including the use of mechanical aids, tools, equipment and safe work procedures, and
- how to report a problem or maintenance issues.

You should review your training program regularly and also when there is change to work processes, plant or equipment, implementation of new control measures, relevant legislation or other issues that may impact on the way the task is performed.

You should keep records of induction and training given to your workers. The records can include information such as the date of the session, the topics dealt with, and the name and signature of the trainer and each of the workers who attended the session.

6. HOW TO REVIEW CONTROL MEASURES

Once you have implemented your control measures, you should check that they work correctly and monitor their effectiveness.

The [draft] WHS Regulations require that a person conducting a business or undertaking must review and if necessary revise all control measures:

- before any change is made to a thing or system of work that involves the performance of a hazardous manual task, including a change in the place where the task is performed
- before a thing is used for a purpose other than that for which it was designed if the intended use may require a worker to perform a hazardous manual task
- if new or additional information about the hazardous manual task becomes available
- if musculoskeletal disorder is reported by or on behalf of a worker
- if a notifiable incident occurs in relation to the performance of a hazardous manual task
- if the control measures do not control the risk
- if a health and safety representative at the workplace requests a review.

You can use the same methods as in the initial hazard identification step to check controls. Consult your workers involved in the manual task and their health and safety representatives and consider the following questions:

- Are the control measures working effectively in both their design and operation, without creating new risks?
- How effective is the risk assessment process? Are all hazards being identified?
- Are workers actively involved in the risk management process? Are they openly raising health and safety concerns and reporting problems promptly?
- Have new work methods or new equipment reduced physical strain or difficulty?
- Has instruction and training on hazardous manual tasks and the implemented control measures been successful?
- Are the frequency and severity of MSDs reducing over time?
- If new legislation or new information becomes available, does it indicate current controls may no longer be the most effective?

Quality assurance processes can be used if you design, manufacture or supply products used in manual tasks to check that the product effectively minimises the risk of MSDs. Obtain feedback from users of the product to determine whether any improvements can be made to make it safer.

If problems are found, go back to any point in the risk management process, review your information and make further decisions about risk control.

6.1 Keeping records

Keeping records of the risk management process demonstrates potential compliance with the WHS Act and Regulations. It also maximises the effectiveness of the process and assists when undertaking subsequent risk assessments.

The information which should be recorded includes:

- the hazardous manual tasks, their associated risks and chosen control measures
- how and when the control measures were implemented, monitored and reviewed
- relevant related training records
- the consultation undertaken and who was involved
- checklists, worksheets and any risk assessment tools used in working through the risk management process, and
- action plans for the development and implementation of control measures.

7. ROLE OF DESIGNERS, MANUFACTURERS, IMPORTERS AND SUPPLIERS

The best time to eliminate or minimise the risk of MSDs is in the design and planning stage – when hazards and risks can be ‘designed out’ before they are introduced into a workplace.

Designers, manufacturers, importers and suppliers of plant and structures have duties under the WHS Act to ensure, so far as is reasonably practicable, that these products are without risks to health and safety when used for a purpose for which they were designed or manufactured.

7.1 Role of designers

If you are a designer of plant or structures used for work, you must ensure that the plant or structure is designed to be without risks to the health and safety of persons so far as is reasonably practicable. This means that you should:

- design the plant or structure to eliminate the need to carry out a hazardous manual task, and
- where this is not reasonably practicable, minimise the risk of MSDs arising from hazardous manual tasks.

Ergonomic principles should be applied in the design stage. This means that a manual task should be designed to fit the people doing the task, not the reverse. Ergonomics involves consideration of the variability in human capability and an understanding of how people interact with the work environment, tools and equipment.

If you provide your design to another person (for example, a manufacturer) then you must provide certain information, including:

- the purpose for which the plant or structure was designed
- how you have dealt with hazards that may impact on manual tasks in your design, and whether there are any residual risks, and
- how to handle the product safely, including during its transportation, installation, operation, maintenance and disposal.

It is a good idea to review your design from time to time. When modifying a design, take into account feedback from purchasers and users of your product.

Design of structures

Designers of structures should consider the manual tasks that may be performed throughout the lifecycle of the structure, from construction, through to use, maintenance, refurbishment to potential demolition. For example, design:

- building materials that are strong yet light weight
- large structural components with suitable lifting points to enable lifting by crane
- spaces large enough to accommodate or incorporate mechanical devices
- the layout of the workplace to minimise distances for pushing, pulling, lifting or carrying loads, and
- floor surfaces to enable wheeled equipment to be pushed or pulled easily.

Some types of workplaces, such as hospitals, nursing homes, warehouses and distribution centres that carry out a high level of manual tasks will have particular design requirements to eliminate or minimise the risk of MSDs.

Design of plant

The safe design of plant can play a critical role in reducing the risk of MSD for workers. When designing plant, consider all phases of its life, including manufacture, cleaning and servicing.

If practicable, trial a prototype in a range of operating conditions and think about how the plant will be used. Change any aspects of the design that increase the risk of injury, for example:

- eliminate or reduce the number of repetitive actions, postures and movements required to operate the plant
- design handles on tools and controls to allow normal wrist postures
- reduce the forces required to operate the plant
- provide instructions, signs or symbols to help people use the plant properly
- take into account the range of physical characteristics, such as size and strength, of those who use the plant
- ensure that the plant operates at a speed or rate that would suit most users, and
- ensure that regular maintenance points are easily accessible.

Appendix E lists some examples of design related MSD risks for plant, and shows how to control the risks through safe design.

7.2 Role of manufacturers, importers and suppliers

If you are a manufacturer, importer or supplier, you should consider the way your products are packaged and delivered to workplaces to eliminate or minimise the risk of MSDs, for example:

- provide lifting aids or lifting points so mechanical aids can be used
- provide two handles or handholds to prevent one-handed lifting, particularly where the load is heavy or needs to be moved frequently
- repackage the load into a different weight, size or shape:
 - Large and bulky loads are difficult to handle, promote awkward postures, increased muscular exertion and are difficult to hold close to the body
 - Heavy loads generally require greater force to handle.
 - Loads that are unwieldy, unstable or move unpredictably increase risk by creating sudden high forces

You should minimise the risk of sudden movement of a load by arranging items in a package so they are well balanced and will not shift unexpectedly while being handled, for example:

- use slings or other aids to maintain effective control when handling loads that lack rigidity
- fill containers holding liquids or free-moving powder so that there is only small amount of free space at the top of individual containers
- use baffles, dividers or packing materials to keep the contents stable in partly filled packages
- secure loads which may move during handling, for example, animals in slings, fertiliser bags inside sturdy boxes, and
- shrink wrapping loads on pallets.

Providing information

You must also give purchasers and users the information they need to use the product safely, including during its transportation, operation and maintenance. You could provide this information in user manuals, brochures or on the product itself (for example, labelling cartons). Make sure that all the information you provide is accurate, clear and easy to understand.

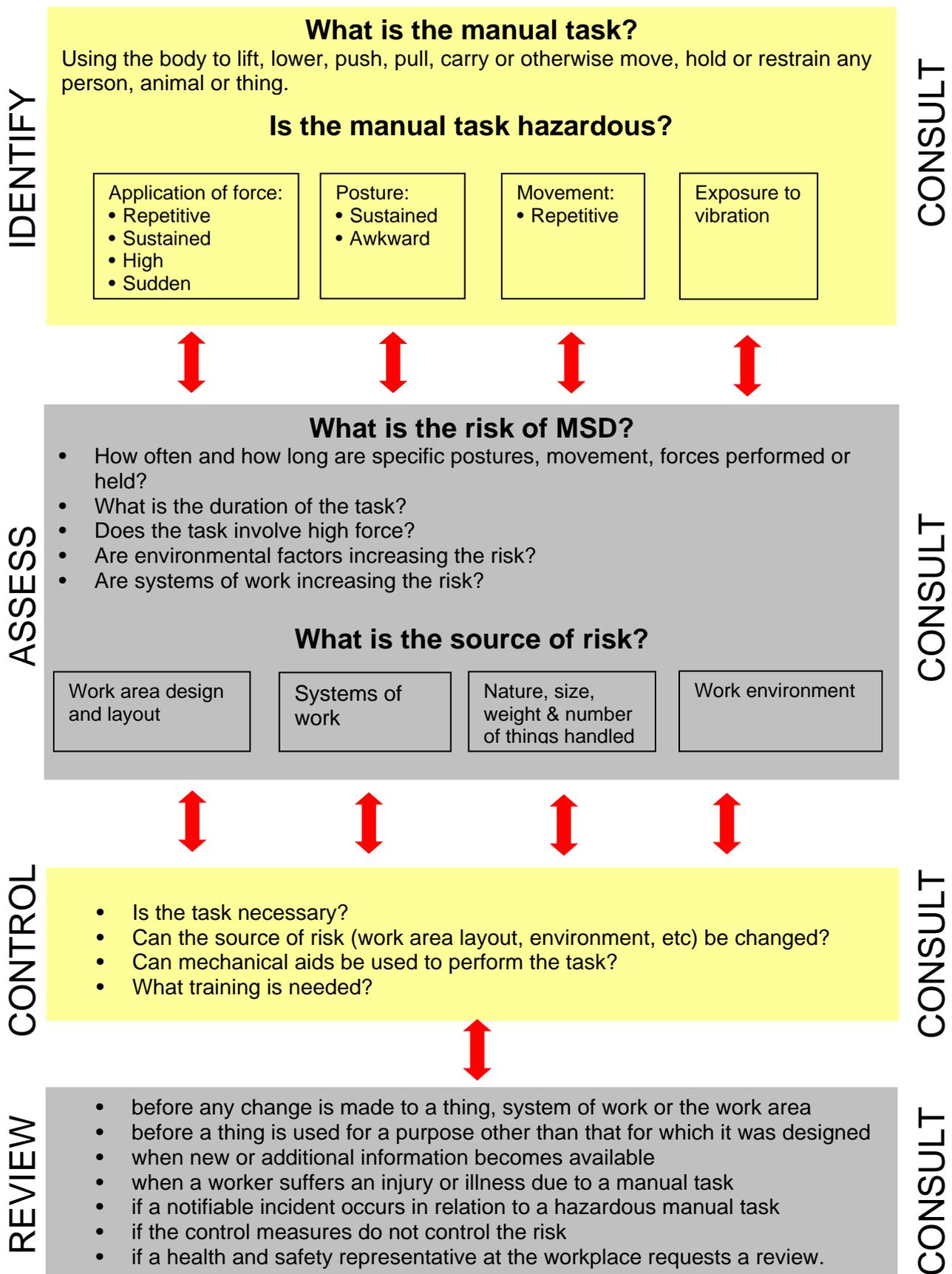
You should label loads to indicate any MSD risks, and where appropriate, any necessary precautions when handling the load. This information should indicate:

- the heaviest side of an off-centred load, for example, with an arrow drawn on the packing carton
- the weight of the load
- whether the load is fragile
- the stability of the load, for example, a label saying that the contents of a package may move while being transported or handled, and
- any specific handling or unpacking instructions.

Information provided by the designer to the manufacturer should be passed on to the supplier and then to the purchaser. Importers should obtain the information from their suppliers.

If you are an importer or a supplier and you cannot get this information from the designer or manufacturer, you should obtain information from other sources or develop it yourself.

APPENDIX A – THE RISK MANAGEMENT PROCESS FOR MANUAL TASKS



APPENDIX B – HAZARDOUS MANUAL TASK IDENTIFICATION WORKSHEET

Work area:

Management representative:

Health and Safety representative and workers taking part:

Date:

Does the task have any of the characteristics of a hazardous manual task? (tick any of the following that apply)

Task	Repetitive or sustained force	High or sudden force	Sustained or awkward postures	Repetitive movement	Exposure to vibration
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you ticked any boxes for a particular task, you should do a risk assessment of that task.

APPENDIX C – DISCOMFORT SURVEY

A discomfort survey can help identify hazardous manual tasks. Early reporting of symptoms can lead to risk controls being put in place before injury occurs.

The survey sheet below will help you identify and record instances where workers experience discomfort that:

- > persists, or
- > re-occurs the next day, or
- > persists after rostered days off.

Encourage workers to report pain or discomfort at work or at any other time. Follow up the reasons for the problem. Even if only one worker reports problems, assess the presence of a risk factor.

Name (optional) _____

Date _____

Job work location _____

Tasks involved _____

Time on this job: Less than 3mths 3mths to 1 yr 1 to 5 yrs

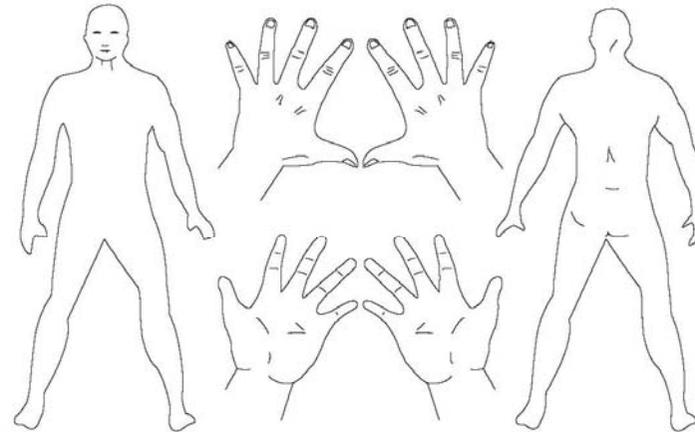
Supervisor _____

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

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

1. _____ 2. _____ 3. _____ 4. _____ 5. _____
Just Moderate Unbearable
noticeable

3. What do you think caused the problem?



APPENDIX D – ASSESSING AND CONTROLLING RISKS

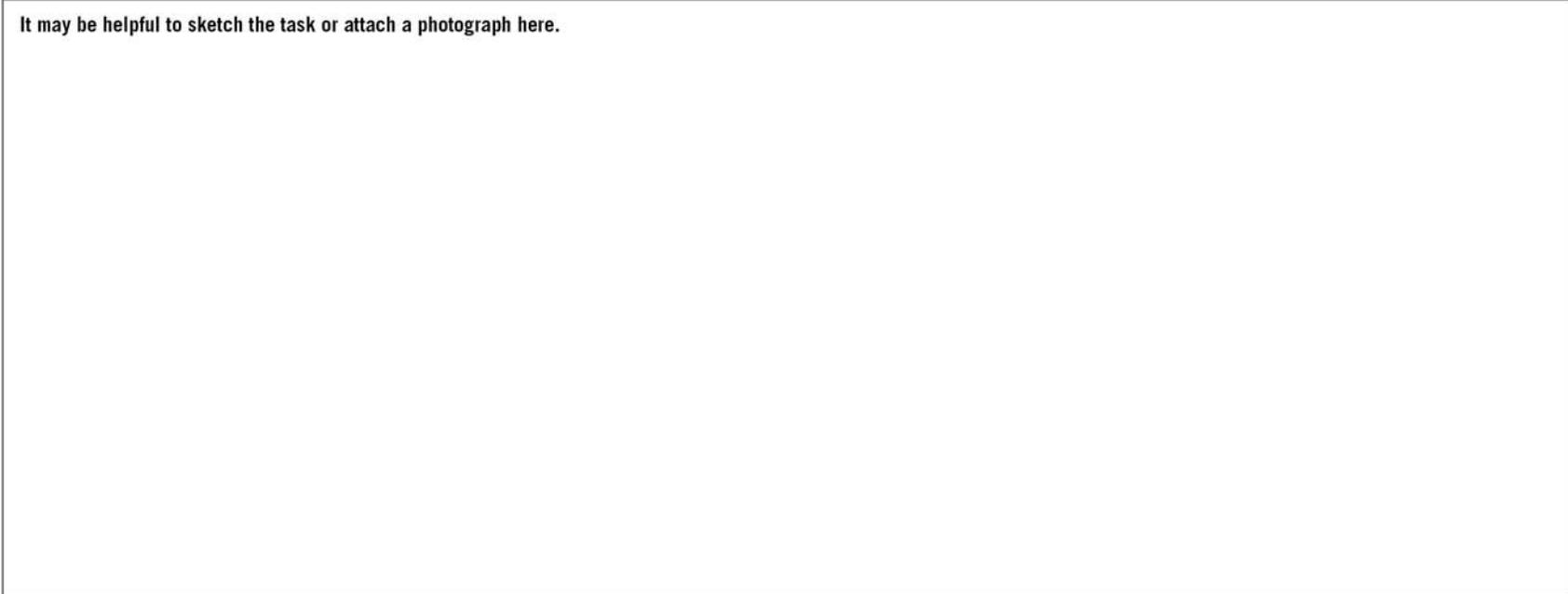
Location of task: Description of hazardous manual task: Date of assessment:	Management rep: Health and Safety rep: Others (workers, consultants):
--	--

Reason for identification

<input type="checkbox"/> Existing task	<input type="checkbox"/> Change in task, object or tool	<input type="checkbox"/> Report of musculoskeletal disorder (MSD)
<input type="checkbox"/> New task	<input type="checkbox"/> New information	

Describe the task and area.

It may be helpful to sketch the task or attach a photograph here.



RISK ASSESSMENT

Step 1a – Does the task involve repetitive movement or sustained or awkward postures?

Tick yes if the task requires any of the following actions to be done:

- more than twice a minute (repetitive) OR more than 30 seconds at a time (sustained)

Postures and Movements	Yes	This action happens when...	because (describe why) Source of the risk	Duration of task
EXAMPLE Bending the back forwards or sideways more than 20 degrees	✓	Picking things from a conveyor	<ul style="list-style-type: none"> • Conveyor is too low 	30 times per minute performed 3 hours per day
Twisting the back more than 20 degrees	<input type="checkbox"/>			
Bending the back of head backwards for more than 5 degrees	<input type="checkbox"/>			
Bending the head forwards or sideways more than 20 degrees	<input type="checkbox"/>			
Twisting the neck more than 20 degrees	<input type="checkbox"/>			
Working with one or both hands above shoulder height	<input type="checkbox"/>			
Reaching forwards or sideways more than 30 cm from the body	<input type="checkbox"/>			
Reaching behind the body	<input type="checkbox"/>			
Squatting, kneeling, crawling, lying, semi-lying or jumping	<input type="checkbox"/>			
Standing with most of the body's weight on one leg	<input type="checkbox"/>			
Twisting, turning, grabbing, picking or wringing actions with the fingers, hands or arms	<input type="checkbox"/>			

Postures and Movements	Yes	This action happens when...	because (describe why) Source of the risk	Duration of task
Working with the fingers close together or wide apart	<input type="checkbox"/>			
Very fast movements	<input type="checkbox"/>			
Excessive bending of the wrist	<input type="checkbox"/>			

Step 1b – Does the task involve any repetitive or sustained forces?

Tick yes if the task requires any of the following actions to be done:

- more than twice a minute (repetitive) OR more than 30 seconds at a time (sustained)

Repetitive or sustained forces	Yes	This action happens when...	because (describe why) Source of the risk	Duration of task
EXAMPLE Lifting or lowering	<input checked="" type="checkbox"/>	Putting things onto pallet	<ul style="list-style-type: none"> • Pallet is on the ground • Trolley jack is the only way to move pallet 	5 times per minute for 3 hours a day
Lifting or lowering	<input type="checkbox"/>			
Carrying with one hand or one side of the body	<input type="checkbox"/>			
Exerting force with one hand or one side of the body	<input type="checkbox"/>			
Pushing, pulling or dragging	<input type="checkbox"/>			
Gripping with the fingers pinched together or held wide apart	<input type="checkbox"/>			
Exerting force while in an awkward posture, e.g., <ul style="list-style-type: none"> • supporting items while arms or shoulders are in an awkward posture • moving items while legs are in an awkward posture 	<input type="checkbox"/>			
Holding, supporting or restraining any object, person, animal or tool	<input type="checkbox"/>			

Step 2 – Does the task in step 1a or 1b involve long duration?

Tick yes if the task is done for:

Duration	Yes	Comments
More than 2 hours over a whole shift,	<input type="checkbox"/>	
Continually for more than 30 minutes at a time	<input type="checkbox"/>	
If you ticked yes then the task is a risk and risk control is required		

Step 3 – Does the task involve high or sudden force?

Tick yes if the task involves any of the following high force actions, even if force is applied only once

High or sudden force	Yes	This action happens when...	Because (describe why) Source of the risk
EXAMPLE Lifting, lowering or carrying heavy loads	<input checked="" type="checkbox"/>	Picking up and putting down boxes	• Boxes are heavy and awkward shape and no handholds
Lifting, lowering or carrying heavy loads	<input type="checkbox"/>		
Applying uneven, fast or jerky forces during lifting, carrying, pushing or pulling	<input type="checkbox"/>		
Applying sudden or unexpected forces (e.g. when handling a person or animal)	<input type="checkbox"/>		
Pushing or pulling objects that are hard to move or to stop (e.g. a trolley)	<input type="checkbox"/>		
Using a finger-grip, a pinch-grip or an open-handed grip to handle a heavy or large load	<input type="checkbox"/>		
Exerting force at the limit of the grip span	<input type="checkbox"/>		

High or sudden force	Yes	This action happens when...	Because (describe why) Source of the risk
Needing to use two hands to operate a tool designed for one hand	<input type="checkbox"/>		
Throwing or catching	<input type="checkbox"/>		
Hitting or kicking	<input type="checkbox"/>		
Holding, supporting or restraining a person, animal or heavy object	<input type="checkbox"/>		
Jumping while holding a load	<input type="checkbox"/>		
Exerting force with the non-preferred hand	<input type="checkbox"/>		
Two or more people need to be assigned to handle a heavy or bulky load	<input type="checkbox"/>		
Exerting high force while in a bent, twisted or awkward posture	<input type="checkbox"/>		
Workers report pain or significant discomfort during or after the task	<input type="checkbox"/>		
The task can only be done for short periods	<input type="checkbox"/>		
Stronger workers are assigned to do the task	<input type="checkbox"/>		
Workers think the task should be done by more than one person, or seek help to do the task	<input type="checkbox"/>		
Workers say the task is physically very strenuous or difficult to do			
<p>If you ticked yes to any box in step 3 the task is a risk and risk control is required</p>			

Step 4 – Are aspects of the work environment increasing the risk?

Tick yes if any of the following environmental factors are present in the task.

Work environment	Yes	This action happens when...	Because (describe why) Source of the risk
EXAMPLE Vibration	✓	Breaking concrete	• Using a jackhammer
Hand-arm vibration	<input type="checkbox"/>		
Whole body vibration	<input type="checkbox"/>		
High temperatures	<input type="checkbox"/>		
Radiant heat	<input type="checkbox"/>		
High humidity	<input type="checkbox"/>		
Low temperatures	<input type="checkbox"/>		
Wearing protective clothing while working in hot conditions	<input type="checkbox"/>		
Wearing thick clothing while working in cold conditions (e.g. gloves)	<input type="checkbox"/>		
Handling very cold or frozen objects	<input type="checkbox"/>		
Workers are working in hot conditions and are not used to it	<input type="checkbox"/>		

Step 5 – Are aspects of the way work is organised increasing the risk?

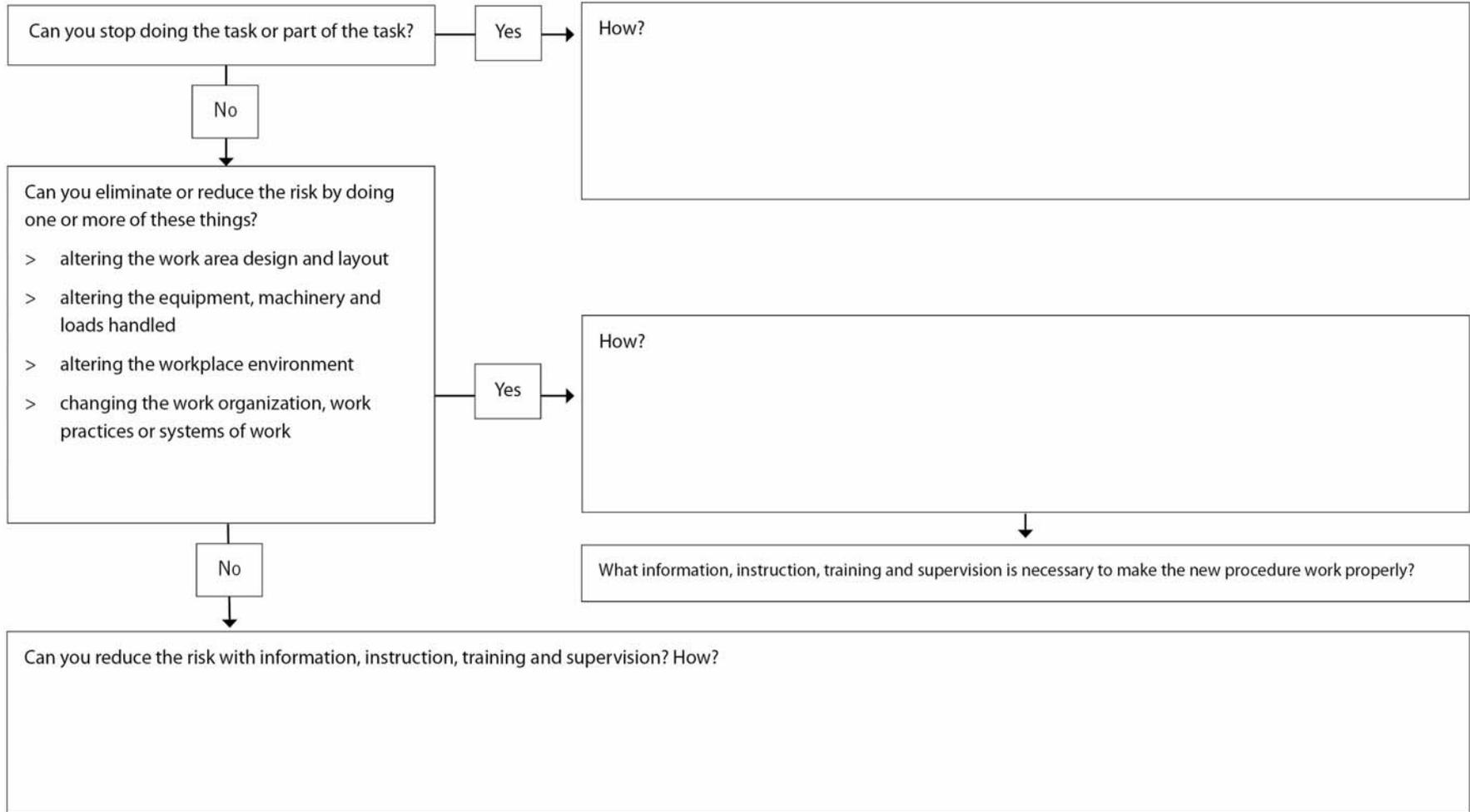
Tick yes if any of the following psychosocial factors are present in the task.

Systems of work	Yes	This action happens when...	Because (describe why) Source of the risk
EXAMPLE The work rate is set by a machine or team and not under worker control	✓	Picking things off the conveyor	<ul style="list-style-type: none"> Reaching to pick up things before they have arrived to keep up with the pace
The work rate is set by a machine or team and not under worker control	<input type="checkbox"/>		
Systems of work, such as piecework, that encourage workers to skip breaks to finish early, or to produce more items in the set time	<input type="checkbox"/>		
Levels of work demand that workers find difficult to keep up with (pace)	<input type="checkbox"/>		
Sustained high levels of attention and concentration	<input type="checkbox"/>		
Systems of work that offers the worker little or no control over the way they do their work	<input type="checkbox"/>		
Workers frequently needing to meet tight deadlines	<input type="checkbox"/>		
Sudden changes of workload or seasonal changes in volume without any mechanisms for dealing with the change	<input type="checkbox"/>		
Levels of physical work demand that workers find difficult to maintain (effort)	<input type="checkbox"/>		
Unsuitable equipment and/or insufficient staffing levels	<input type="checkbox"/>		

RISK CONTROL

What needs to be fixed to control the risk? (Refer Section xx)

You may need to use a combination of risk controls to eliminate or minimise the risk as far as reasonably practicable.



APPENDIX E – CONTROLLING MSD RISKS THROUGH DESIGN

Type of plant	MSD risk	Possible design solution
Road-making machinery	Repetitive or sustained twisting of the neck and body while reversing. This is caused by the seat being fixed in a forward-facing position.	Design a swivel seat-mount together with two sets of controls, or controls that move with seat rotation.
Forklifts	Sustained exposure to whole-body vibration transferred through the seat. Repetitive or sustained bending of the neck and back to see the work properly (for example, continually looking up to place loads on high shelves).	Install damping mechanisms in the seat, cabin and vehicle suspension. Install visual aids such as mirrors or a video camera and screen.
Wrapping machines on process lines	Strain on the lower back when handling heavy rolls of plastic wrapping in awkward and twisted postures, often above shoulder height. This is caused by inappropriate design and positioning of the roll spindle and by restricted access.	Design the spindle to be adjustable. This allows the rolls to be loaded at a suitable height and orientation, and eliminates the need to lift them. Design equipment to help worker load rolls. Locate the spindle in an accessible place on the plant. Provide information about how to install the plant in a way that allows adequate access.
Power drills	Prolonged use of the forearm muscles and wrist caused by a heavy or poorly balanced drill. Exposure to vibration or impact shock recoil from hammer drills. Excessive force needed to grip and control the tool to counter the effect of vibration and impact shocks.	Design drills to be as light as possible. Design drills with the handle under the drill's centre of gravity. Design plant to reduce shock and vibration. Provide a suitable way of holding the tool with both hands.
Pliers	Pressure to the palm of the hand caused by handles that are too short. Prolonged use of the forearm muscles and compression of the wrist caused by using pliers with straight handles.	Design pliers with handles that extend beyond the palm. Design pliers with bent handles so that the user can maintain a straight wrist.
Crimping, clamping and cutting tools	Excessive force with outstretched fingers required to grip handles that are too wide apart.	Design handles with a grip span of 10 cm or less.
Chainsaws	Excessive vibration. High force required to handle the chainsaw.	Design to reduce vibration. Design the chainsaw to be as light as possible, and provide well-placed handles.
Chairs	Poorly designed chairs that cannot be adjusted provide little back support and cause workers to adopt poor postures and movements.	Follow existing design guidelines for chairs, and consider how the chair will be used in the workplace.
Work-benches, workstations and other work surfaces	Workstations that cannot be adjusted result in unnecessary reaching, bending and exertion of force.	Design workstations to be adjustable. Alternatively, dimensions should suit as many workers as possible.