



Government of Western Australia  
Department of Commerce

# Code of practice

# Manual tasks

## 2010



commission  
for occupational  
safety and health

CODE OF PRACTICE

MANUAL TASKS

COMMISSION



Code of practice  
**Manual tasks**

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2010

## Foreword

This code of practice is issued by the Commission for Occupational Safety and Health (the Commission) under the *Occupational Safety and Health Act 1984* (the OSH Act). The Commission's objective is to promote comprehensive and practical preventive strategies that improve the working environment of Western Australians.

This code of practice has been developed through a tripartite consultative process and the views of employers and unions, along with those of government and experts, have been considered.

## Legislative framework for occupational safety and health

### *The Occupational Safety and Health Act 1984*

The OSH Act provides for the promotion, co-ordination, administration and enforcement of occupational safety and health in Western Australia. It applies to all workplaces with the exception of mining and petroleum.

The OSH Act places certain duties on employers, employees, self-employed people, manufacturers, designers, importers and suppliers. It also places emphasis on the prevention of accidents and injury.

In addition to the broad duties established by the OSH Act, the legislation is supported by regulations, together with a lower tier of non-statutory codes of practice and guidance notes.

### *Occupational Safety and Health Regulations 1996*

The Occupational Safety and Health Regulations 1996 (the OSH regulations) prescribe minimum standards and have a general application, or define specific requirements related to a particular hazard or type of work. They may allow licensing or granting of approvals and certificates.

If there is a regulation about a risk in the OSH Regulations, it must be complied with.

## Codes of practice published under the OSH Act

A code of practice is a document prepared for the purpose of providing:

- practical guidance on how to comply with a general duty under the OSH Act or specific duties under the OSH Regulations;
- without being prescriptive, practical guidance on safe work practices that can be used to reduce the risk of work-related injury and disease; and
- a practical means of achieving any code, standard, rule, provision or specification relating to occupational safety and health in Western Australia.

A code of practice may contain explanatory information. However, work practices included may not represent the only acceptable means of achieving the standard to which the code refers. Compliance with codes of practice is not mandatory but a code may be used by courts as the standard when assessing other methods or practices used. A code of practice does not have the same legal force as a regulation and non-compliance is not sufficient reason, of itself, for prosecution under the OSH Act.

Note that there may be additional risks at the workplace not specifically addressed in this code of practice. The OSH Act requires identification of them and implementation of control measures to prevent or minimise exposure.

## Scope and application of this code

In May 2010, the Minister for Commerce approved this code under section 57 of the OSH Act.

This document replaces the Western Australian *Code of practice: Manual handling* and the *National code of practice for the prevention of occupational overuse syndrome*, as approved codes of practice in Western Australia.

This code of practice applies to all workplaces in Western Australia covered by the OSH Act. It provides:

- general guidance for employers and workers on the identification, assessment and control of safety and health hazards and risks associated with manual tasks in which forces exerted, loads handled, repetitive movement, awkward postures, sustained postures and equipment and tools that expose workers to vibration are of concern; and
- information on key legislative requirements in the OSH Act and the OSH Regulations, as they relate to hazardous manual tasks.

## Benefits of using this code of practice

The benefits of implementing programs to eliminate or reduce the risk arising from performing manual tasks include:

- preventing injury, illness, pain and suffering of individuals in the workplace;
- improved business performance, efficiency and productivity;
- fewer workers' compensation claims, which may lead to lower premiums;
- faster and easier return to work for workers who do sustain an injury;
- fewer absences from work and less disruption;
- retention of skilled workers; and
- a safe workplace with a positive safety culture.

## Disclaimer

The information contained in this publication is provided in good faith and believed to be reliable and accurate at the time of publication. However, the information is provided on the basis that the reader will be solely responsible for assessing the information and its veracity and usefulness. The State shall in no way be liable, in negligence or howsoever, for any loss sustained or incurred by anyone relying on the information, even if such information is or turns out to be wrong, incomplete, out-of-date or misleading.

In this disclaimer:

- State means the State of Western Australia and includes every Minister, agent, agency, department, statutory body corporate and instrumentality thereof and each employee or agent of any of them;
- information includes information, data, representations, advice, statements and opinions, expressly set out or implied in this publication; and
- loss includes loss, damage, liability, cost, expense, illness and injury including death.

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## 1. Introduction

Almost all jobs include work that involves performing some form of manual task. This code of practice provides practical guidance for managing risks associated with those manual tasks that have the potential to cause or contribute to injury or illness.

### 1.1 Interpretation

For the purposes of this code, the following definitions are provided.

**Manual tasks** refers to any activity or sequence of activities that requires a person to use their physical body (musculoskeletal system) to perform work including:

- manual handling (the use of force in lifting, lowering, pushing, pulling, carrying or otherwise moving, holding or restraining any person, animal or thing);
- performing repetitive actions;
- adopting awkward or sustained postures; and
- using plant, tools or equipment that exposes workers to vibration.

**Activity** refers to the movements or postures adopted at any given time in order to perform a manual task.

**Hazard** means anything that may result in injury or harm to the health of a person.

Those manual tasks that have the potential to cause injury or disease are referred to in this code of practice as hazardous manual tasks.

**Hazardous manual tasks** include:

- (a) manual tasks having any of the following characteristics:
  - i. forces exerted by the worker (eg lifting, lowering or carrying) or on the worker by an item, person or animal (eg restraining a dog);
  - ii. awkward postures (eg bending forwards, twisting or reaching);
  - iii. sustained postures (eg prolonged sitting or standing);
  - iv. repetitive movements (eg repeating an action frequently, without breaks);
  - v. vibration – whole-body (eg sitting in certain vehicles) and hand-arm (eg using certain powered tools);
- (b) manual tasks involving the handling of a person or an animal; or
- (c) manual tasks involving the handling of unstable or unbalanced loads or loads difficult to grasp or hold.

**Musculoskeletal disorder** means an injury or disease of the musculoskeletal system.

**Risk** in relation to any injury or harm, means the probability of that injury or harm occurring.

## 1.2 Overview of general duties

'General duty of care' and 'general duties' are terms used to refer to the duties that the OSH Act places to, as far as practicable, ensure workers' safety and upon people to ensure their own safety at work and that of others who are at the workplace or who might be injured by their work.

People and organisations who have general duties under the OSH Act are:

- employers;
- employees;
- self-employed people;
- principals (people who engage contractors in the course of their trade or business);
- contractors and people engaged or employed by the contractor;
- people who have control of workplaces or the access to or egress from a workplace;
- designers, manufacturers, importers or suppliers of plant or substances to be used at a workplace;
- erectors or installers of plant for use at a workplace;
- designers or constructors of buildings or structures for use at a workplace;
- agents who are in the business of hiring out workers (labour hire organisations) and their clients (host employers);
- workers who are hired out to a host employer by a labour hire company;
- people who are in a working relationship that mirrors a contract of employment but is not a contract of employment;
- corporate bodies that engage workers under one of the labour relationships covered by the OSH Act;
- Government of Western Australia; and
- people employed by the Government of Western Australia.

### Examples of different general duties

Employers must provide:

- a workplace where workers are not exposed to hazards as far as practicable;
- a safe system of work; and
- information, instruction, training and supervision to workers so they can work in a safe manner.

Employers and self-employed people must, as far as practicable, look after their own safety and health and ensure that their work does not affect the safety and health of others.

Workers must take reasonable care for their own safety and health and that of others affected by their work.

Workers and safety and health representatives must be consulted about safety and health and co-operate with their employer in relation to safety and health at the workplace.

Designers, manufacturers, importers and suppliers must provide plant which is safe to install, maintain and use at workplaces.

People who install or erect plant must ensure it does not expose people who use it to hazards.

For more information on the 'duty of care' obligations, see the Commission's guidance note, *General duty of care in Western Australian workplaces*



## 2. Hazardous manual tasks

### 2.1 How does performing manual tasks result in injury?

Most jobs require several types of manual tasks to be performed. However, not all manual tasks are hazardous. The most common health problems that can arise from manual tasks that are hazardous are musculoskeletal disorders (such as sprains and strains, disc injuries and tendonitis) and hernias.

A musculoskeletal disorder is an injury or disease of the musculoskeletal system. Musculoskeletal disorders may arise in whole or in part from performing manual tasks in the workplace, whether occurring suddenly or over a prolonged period of time.

Musculoskeletal disorders include body-stressing injuries and conditions such as:

- sprains and strains of muscles, ligaments and tendons (eg back strain);
- joint injuries or degeneration (eg frozen shoulder or arthritis of the back);
- disc protrusions, disc herniations or disc degeneration of the back or neck;
- nerve injury or compression (eg carpal tunnel syndrome);
- muscular and vascular disorders (eg vibration-induced white finger from hand-arm vibration); and
- soft tissue injuries.

Musculoskeletal disorders may result from:

- gradual wear and tear caused by frequent or prolonged periods of performing manual tasks (eg a storeperson continually handling stock between deliveries);
- sudden damage caused by intense or strenuous manual handling or awkward lifts (eg a labourer lifting a compactor or a glazier lifting a pane of large glass from the ground on to a truck); or
- direct trauma caused by unexpected events (eg a storeperson walking on uneven ground carrying a large heavy carton who trips and falls).

Experience has shown most musculoskeletal disorders are associated with day to day tasks. Very often there is no 'accident' (sudden or unexpected event) associated with the injury. The person may not feel pain until several hours after the injury occurs. This means an investigation into a manual task injury must look at all relevant tasks the injured person usually performs.

## 2.2 Risk factors in performing manual tasks

There are a number of factors that may make a manual task hazardous, particularly for the development of musculoskeletal disorders. Some of these are known to have direct effects on the body, while others contribute to the risk by making the task more difficult to perform. These factors have been classified as direct and indirect risk factors.

### Direct risk factors

Risk factors that have a direct effect on the body include:

- actions and postures (including awkward postures, sustained postures and repetitive movement);
- forces and loads (including forceful exertion); and
- exposure to vibration (including whole-body and hand-arm vibration).

### Indirect risk factors

Risk factors that can make the task more difficult to perform include:

- the working environment (eg poor lighting and cool temperatures);
- systems of work, work organisation and work practices (eg inadequate rest breaks and unfamiliarity of the task); and
- worker characteristics (eg physical limitations).

The above risk factors may interact and increase the overall risk. The overall risk of developing a musculoskeletal disorder will increase if:

- a direct risk factor level is high (eg high forces are required to lift an object);
- the task involves being exposed to more than one direct risk factor (eg lifting heavy loads in awkward postures);
- indirect risk factors are present and interact within a task (eg lifting loads in awkward postures in a cool environment); or
- if there are several hazardous manual tasks that an individual is exposed to during their work shift or as part of their job.

### Sources of risk

Hazardous manual task risk factors may stem from various sources. Addressing the sources of risks is the most effective way of controlling the risks.

The sources of risks may be varied and can include:

- work area design and lay-out (eg inadequate space for task type);
- the nature of the item, equipment or tool (eg poorly designed chairs);
- the nature of the load (eg heavy load);
- the working environment (eg cool temperatures); and
- systems of work, work organisation and work practices (eg low job control).

### 2.3 Preventing injuries from performing manual tasks

Performing manual tasks is an essential part of jobs in most workplaces. Managing the risks from performing manual tasks requires systematically identifying, assessing and controlling those risk factors. This is known as the *Three step process*, or *risk management process*, as described below. This process should take on a practical participative approach with those involved in designing, controlling and performing the task.

The risk management process will help identify hazardous manual tasks and assist in understanding the nature of the associated risks and the source of the risks, so that informed decisions about what to do to eliminate or control them can be implemented.

The three step process should take place:

- regularly, as part of operations;
- when a hazard, injury/disorder, incident or near miss has been reported in relation to a manual task;
- when new manual tasks are being introduced; and
- when there are changes that influence the way manual tasks are performed (eg change in environment, equipment, systems of work).

The manual task risk management process ensures that the demands of the task do not exceed the physical capabilities of workers performing the job. This process may be applied before or after an injury, and it may be used for individuals with and without physical limitations.

Workers should be encouraged to report musculoskeletal signs and symptoms, such as discomfort, pain, numbness, tingling or weakness early on, so that risk assessments may be conducted and risk can be managed sooner rather than later.

When signs and symptoms of musculoskeletal disorders present, early referral to a health professional for a clear diagnosis, education and treatment (if required) is important. Receiving education from a health professional about the diagnosis and potential work-related risk factors associated with the condition is important for both the affected worker and their managers, so that the risk factors may be assessed and controlled.

Treating a musculoskeletal disorder early, and early return to work to an appropriate role which does not aggravate the condition, are important aspects of reducing the severity of the condition and length of recovery.

This code of practice provides guidance for a risk management process that can be applied at all levels of prevention. It does not provide guidance on injury management or work rehabilitation.

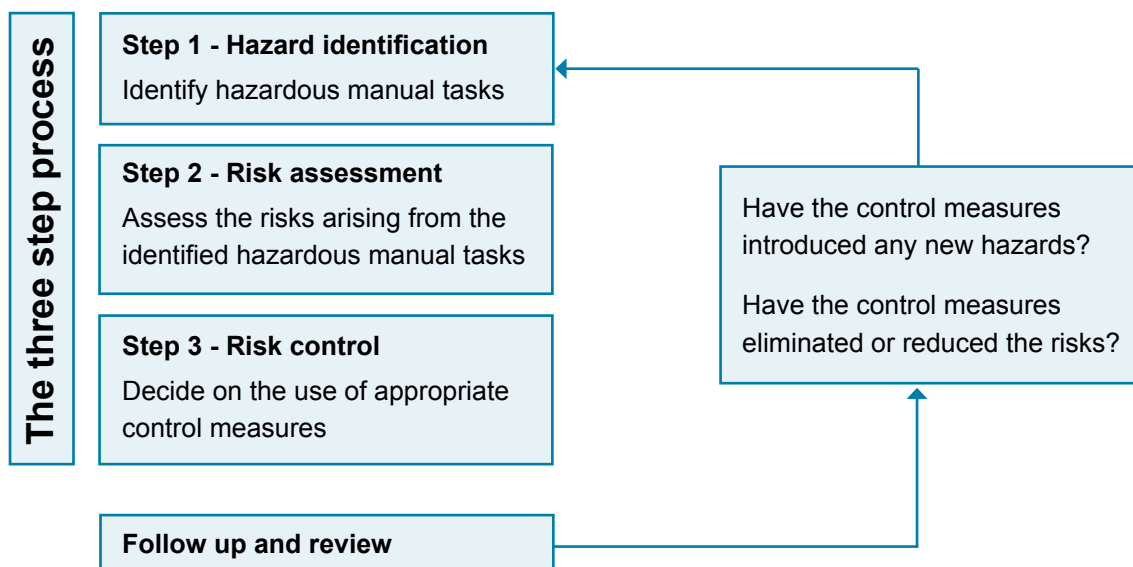


Illustration 1. The risk management process

## 2.4 Important decisions

Before commencing the three step risk management process, the following important decisions need to be made.

### (i) Who should be involved?

When carrying out the three step process, one or more people should be involved, depending on the size of the workplace. For example, the area supervisor, safety and health representative (where one exists), and the person doing the job may be involved.

If the process of conducting a risk assessment or developing risk control procedures proves to be difficult, then further information should be obtained. Appendix 5 provides a list of potential sources of information.

For some complex situations, expert or specialist (external) advice may be useful when conducting a risk assessment and developing risk control procedures. For example, ergonomic or engineering advice may assist in identifying particular hazards or establishing strategies to eliminate or control the risks associated with a particular task.

Where a safety and health committee exists, it should monitor the implementation of the three step process.

### (ii) What skills and knowledge are needed?

In relation to manual tasks, people undertaking the three step process need to have an understanding of:

- the general duties in the OSH Act and relevant regulations in the OSH Regulations;
- the role and responsibilities of the employer, workers and others at the workplace;
- the relevant work activities of the workplace; and
- how to assess manual tasks using this code of practice.

### (iii) What consultation should take place?

Discussion should take place between the employer, workers who perform manual tasks and, where they exist, their safety and health representatives. This way the day-to-day experiences and knowledge of workers can be used.

Details on how consultation will take place can be determined before the three step process begins. For example, those involved will need to decide how discussion and agreement will take place in dealing with hazards and risks, how each step will be carried out, who is responsible and what they intend to achieve.

### (iv) Should records be kept?

Employers should give consideration to keeping records. This is part of good management for all activities in your workplace. It includes recording any hazardous manual tasks identified, assessment of the risks associated with them, control measures that were selected and implemented, and the evaluation of the implemented control measures.

Keeping records of training provided to managers and workers is also recommended. Such records are a valuable reference in the event of an injury being reported.

The templates in Appendices 1, 2 and 3 can be used as part of record keeping.

### 3. Step 1: Hazard identification

#### 3.1 What is required?

Under regulation 3.1(a) of the OSH Regulations, a person who, at a workplace, is an employer, the main contractor, a self-employed person, a person having control of the workplace or a person having control of access to the workplace must, as far as practicable, identify each hazard to which a person at the workplace is likely to be exposed.

More specifically, regulation 3.4(2)(a) of the OSH Regulations requires that an employer, the main contractor, or a self-employed person must, as far as practicable, identify each hazard that is likely to arise from **manual handling** at the workplace. This includes the identification of manual handling tasks that may give rise to injuries or harm or those where employees have identified concerns.

Section 23K of the OSH Act requires an employer, within a reasonable time after receiving a report from an employee about a hazard or injury, to investigate the matter and determine the action to be taken. The employer must notify the employee of the determination made.

Regulation 3.5 of the OSH Regulations requires that reports of hazards provided by an employee or a safety and health representative to an employer must be investigated by the employer within a reasonable time.

#### 3.2 How do you identify hazards?

The first step in managing risks from performing manual tasks is to identify manual tasks that have the potential to cause injury or harm (ie identify hazardous manual tasks) so that they may be targeted for closer examination and the risks controlled. There are a number of ways to identify hazardous manual tasks. One way is illustrated in the following hazard identification flow diagram, which breaks down *Step 1: Hazard identification* into four stages. These stages are detailed below.

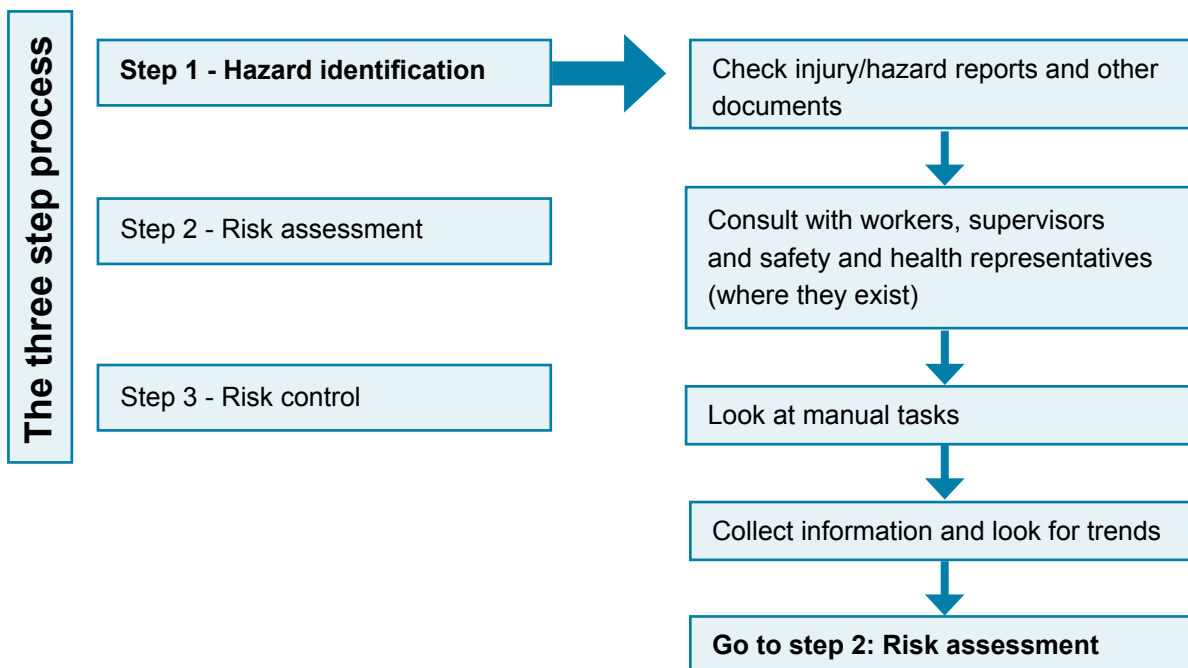


Illustration 2. Hazard identification

### Check injury/hazard reports

Check injury, incident and hazard reports for injuries or hazards related to manual tasks. Identify manual tasks that have been associated with complaints of musculoskeletal symptoms, such as discomfort, pain, numbness and tingling, which may have presented suddenly or over time. Workers' compensation data and injury frequency rates can be analysed to detect patterns of claims related to manual tasks, occupations or locations.

Review any previously conducted workplace health and safety checklists, assessments or health surveillances that may have identified hazardous manual tasks.

Use information from literature that provides information about the risks associated with the type of manual tasks and occupations in your industry (eg reports on musculoskeletal disorders in the nursing profession).

### Consult with workers, supervisors and safety and health representatives

Consult with workers, supervisors and safety and health representatives (where they exist) about whether there are any manual tasks that they consider:

- may have lead to physical strain or are associated with discomfort, pain, numbness or tingling;
- are difficult to do;
- are physically demanding (eg require more than one person or a strong person to do the task);
- are of long duration and high intensity (eg data entry with short deadlines);
- require workers to work with equipment that does not work properly; or
- are problematic when being performed.

### Look at work being performed

Carry out:

- workplace inspections and identify any manual tasks with risk factors that may make the task hazardous (risk factors are listed in Section 2.2); and
- observe how work is done.

### Collect information and look for trends

After collecting the information, sort it so that trends may be identified. A trend analysis will help in deciding which manual handling tasks should have priority for assessment.

From the collected information, identify trends or common problems after sorting it into categories such as:

- **manual tasks** – trends may show that certain manual tasks tend to have the presence of more risk factors than others. This may be associated with the type of activities that must be performed to complete the task in the environment and/or with the equipment provided. For example, a healthcare worker may be exposed to several high risk activities when completing the task of showering a patient, including lifting a heavy load and bending their lower back repeatedly when assisting with dressing, undressing and washing of a patient. In the long term, this task may lead to wear and tear of the tissues of the lower back, increasing the risk of a lower back disorder;
- **jobs and occupations** – trends may show risk factors in a range of tasks done by people working in certain jobs or occupations. For example, council workers may perform several tasks that expose them to repetitive twisting and bending of the back, such as when raking leaves and sweeping paths. In the long term, these activities may result in gradual wear and tear. A high number of accidents or complaints for an occupational group may also indicate a greater likelihood of injury;
- **groups and locations** – trends may indicate higher numbers of potentially hazardous manual tasks are being performed in certain groups and locations of an organisation. For example, workers in a certain group at a certain location are exposed to manual tasks that involve heavy load handling, lack of space, fluctuating staffing levels, uneven ground and poor lighting;

- **types of injury** – trends may highlight that certain injuries are associated with a manual task, job, occupation, group, location or use of certain equipment. For example, shoulder pain may be associated with occupations that require workers to perform manual tasks involving overhead work; and
- **worker characteristics** – trends may highlight certain groups or individuals, such as those of a certain age, sex, physical ability and height, may have difficulty performing certain manual tasks. For example, tall workers may find stacking low shelves difficult to perform and therefore shelving heights need to be assessed and altered as required.

These trends will assist you in determining which manual tasks associated with which jobs/occupations or groups/locations may pose more serious problems than others. This information will be useful during the risk assessment stage when determining which manual tasks should be addressed first. Appendix 1 provides a template for use in recording the information.

This process may also highlight jobs that involve a number of manual tasks that in combination, due to the repetitive or sustained nature of actions and postures adopted across tasks, pose a risk to workers in that job. For these situations, the manual tasks of concern in that job should be assessed collectively using the process as described in Section 4.

### 3.3 Where to from here?

By reviewing the accident reports available at your workplace, consulting with relevant people and looking at the manual tasks, you should now have the information to help you to identify trends in manual task injuries in your workplace.

These trends will assist you in determining which tasks pose a more serious problem than others and allow you to undertake an assessment under *Step 2: Risk assessment*.

## 4. Step two: Risk assessment

### 4.1 What is required?

Under regulation 3.1(b) of the OSH Regulations, a person who, at a workplace, is an employer, the main contractor, a self-employed person, a person having control of the workplace or a person having control of access to the workplace must, as far as practicable, assess the risk of injury or harm to a person resulting from each hazard, if any, that is identified.

More specifically, regulation 3.4(2)(b) of the OSH Regulations requires that an employer, the main contractor, or a self-employed person must assess the risk of injury or harm to a person resulting from each hazard, if any, that has been identified as likely to arise from **manual handling** at the workplace.

Risk assessment involves:

- determining the potential for each risk factor to cause injury to a person performing the task;
- understanding why it is a problem; and
- identifying the sources of the problem.

### 4.2 How to assess risks

There will probably be a number of hazardous manual tasks identified under Step 1. Selecting which should have priority over others for further assessment and control (understanding why they are problems) is therefore very important.

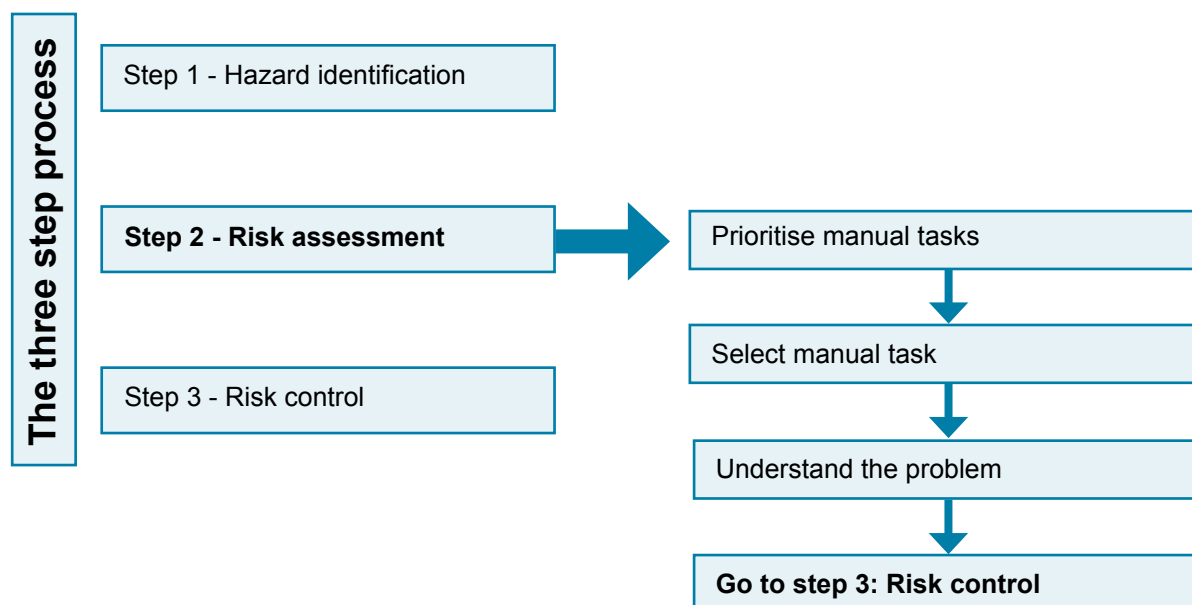


Illustration 3. Risk assessment



## Prioritise manual tasks

In deciding which manual tasks should have priority for assessment, the degree of risk posed by those manual tasks should be considered, including:

- the severity and frequency of injuries that have been associated with that manual task. Severity may be measured in many ways including number of days off work, total financial cost and any incapacity to work after injury;
- the number of workers at risk of injury. Tasks where there are both high numbers of workers at risk of injury and the injuries are of high severity should be given high priority for risk assessment;
- whether new or existing manual tasks appear to be high risk, regardless of whether an injury has resulted (eg lifting very heavy loads); and
- any changes that influence the way manual tasks are performed (eg a change in environment, equipment or systems of work that introduces new or additional risks).

## Select manual tasks

From the priority list of tasks, begin your assessment with the highest priority task and work through to the lowest priority. If it is a complex task (a task with a sequence of activities), it may be easier to divide the task into its various activities. Each activity can then be checked for risks in terms of loads, forces, actions, postures and the characteristics of people doing the work.

For example, with a number of injuries at a nursing home associated with the manual task of showering a patient, this task could be broken down into the activities of:

- lifting the patient out of bed and transferring them to a wheelchair;
- pushing the wheelchair to the shower;
- transferring the patient into a shower chair;
- showering the patient;
- transferring the patient back into the wheelchair;
- dressing the patient; and
- pushing the wheelchair to the day room.

It can also be very useful to divide tasks into activities when there are no obvious practical solutions.

If the cumulative effect of a number of manual tasks in a job is of concern, then the tasks should be assessed collectively using the process as described below.

## Understand why performing the manual task is a problem

It is important to understand why performing a manual task has a high risk of injury, in order to find possible solutions. Performing a risk assessment of the task enables the problems to be looked at from a number of different angles and in more detail. It helps to avoid wrong conclusions and inefficient use of resources.

It is important that this process is collaborative and involves observation and discussion of the manual task with workers, supervisors and, where applicable, safety and health representatives and safety personnel.

Apply the risk assessment checklist on the *Risk assessment template* (in Appendix 2) to the selected task. The principal risk areas covered by the checklist are:

- actions and postures;
- forces and loads;
- vibration;
- working environment;
- systems of work; and
- worker characteristics.

When completing the checklist, determine how each risk factor applies to the task. Rate each factor as 'not applicable', 'low', 'medium' or 'high', based on the information provided in *Guidance material for rating risk factors* (Appendix 4).

It may be helpful to discuss with workers and safety and health representatives or committees where they exist the reasons for the presence of the above risk factors, and situations when they may be most severe. Note that the risks in a manual task can result from a combination of sources of risk. For each of the risk factors that you have identified, determine the source(s) of the risk.

Potential sources of risk include:

- work area design and layout (eg inadequate space for task type);
- the nature of the item, equipment and tool (eg poorly designed chairs);
- the nature of the load (eg heavy load);
- the working environment (eg cool temperatures); and
- systems of work, work organisation and work practices (eg low job control).

Record reasons for your estimated risk rating and the potential sources of risks on the *Risk assessment form* (Appendix 2). If the risk factors identified on the checklist are insufficient to understand the problem satisfactorily, then more detailed specific information or specialist advice should be sought.

The completed risk assessment should provide a clear understanding of the principal risk areas for each activity and the potential sources of risk.

### 4.3 Where to from here?

Now that you have assessed the risk for each manual task or activity in the order in which they were ranked, and you understand the nature and source of the problem associated with the particular task, proceed to *Step 3: Risk control*.

## 5. Step three: Risk control

### 5.1 What is required?

Under regulation 3.1(c) of the OSH Regulations, a person who, at a workplace, is an employer, the main contractor, a self-employed person, a person having control of the workplace or a person having control of access to the workplace must, as far as practicable, consider the means by which the risk may be reduced.

More specifically, regulation 3.4(2)(c) of the OSH Regulations requires that an employer, the main contractor, or a self-employed person must, as far as practicable, consider the means by which the risk arising from **manual handling** hazards identified at the workplace may be reduced.

Under section 19(1) of the OSH Act, an employer must provide and maintain workplaces, plant and systems of work such that, so far as practicable, the workers are not exposed to hazards.

Under section 19(1) of the OSH Act, an employer must also provide such information, instruction and training to, and the supervision of, the employees as is necessary to enable them to perform their work in such a manner that they are not exposed to hazards.

### 5.2 Finding solutions – Developing control options

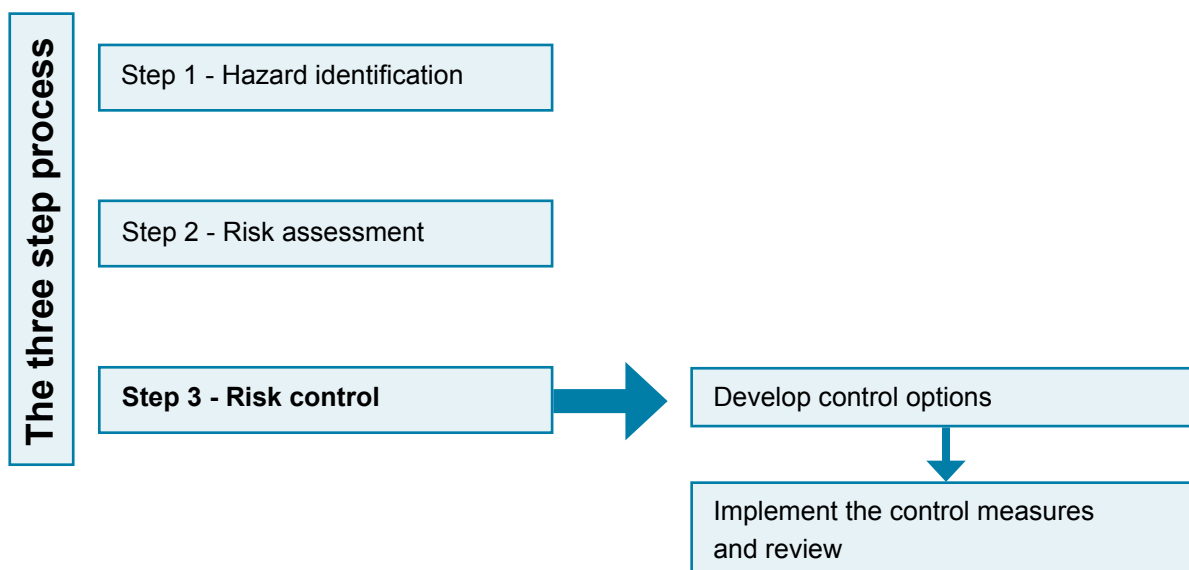


Illustration 4. Risk control

As with all hazards, applying the preferred order (hierarchy) of control measures is important when determining how the risk can be controlled.

There are three main types of control measures that can be applied to hazardous manual tasks. The preferred order of application is as follows.

**1. Eliminate the hazard or hazardous work practice**

**2. Redesign, modify, alter or substitute:**

- the work area and layout;
- the nature of items, equipment and tools;
- the nature of the load;
- the work environment; and/or
- the systems of work, work organisation and work practices.

**3. Apply administrative controls:**

- by providing information, training and supervision; and/or
- developing and enforcing policies and procedures.

The following three questions may assist in working through this sequence.

**Question 1: Can the task be eliminated?**

If the answer is yes, questions two and three do not need answering.

If the hazardous manual task is not necessary, then the task should be ceased, and the hazard therefore eliminated. For example, if polishing corridor floors poses a risk to workers, but is not a necessary task, then one solution to the problem is to cease performing that manual task altogether.

Eliminating a manual task may require redesigning a system of work, workplace, equipment and/or load. Examples of elimination include redesigning a work process so that the task is no longer required, installing a machine that automates the process or applying advances in information technology so that a computer, rather than a person performs the task.

If the answer is no, the manual task cannot be eliminated, proceed to questions two and three.

**Question 2: Can the work be changed to reduce or control the risk of injury?**

Strategies to change work should be aimed at reducing risk factors associated with actions and postures, forces and loads, vibration, the working environment and systems of work.

Risk factors can be reduced by addressing the source of the risk in a number of ways, such as redesigning, modifying, altering and substituting:

- the work area and layout;
- the nature of items, equipment and tools;
- the nature of the load;
- the working environment; or
- systems of work, work organisation and work practices.

Further explanation of these control strategies is detailed below.

### Work area and layout

For example, select appropriate work areas to perform the manual task, increase the space designated for the task, alter the layout to improve work flow, redesign storage or alter the placement of items in the work area. These changes may reduce poor actions and postures such as twisting, reaching and stooping, and reduce the application of force required to complete the task.

Illustration 5. Store heavier and frequently used items at waist level



### Nature of items, equipment and tools

For example, alter the design or substitute the items, equipment and tools for those that allow the manual task to be performed safely and comfortably. The items, equipment and tools should be suited to the environment, reduce the effort required to perform the task, suit a range of users and be able to be used correctly with instruction.

Illustration 6. Provide adjustable chairs for computer based tasks

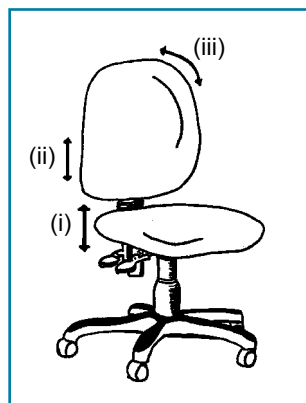


Illustration 7. Use levers to reduce force required



### Nature of load

For example, use a mechanical aid, handling device, or wheeled equipment, divide the load into smaller weights, change the size or shape of the load, apply handles to the load, make the load more stable or place labels on the load.

Illustration 8. Use mobile cranes to reduce the force required to lift the load

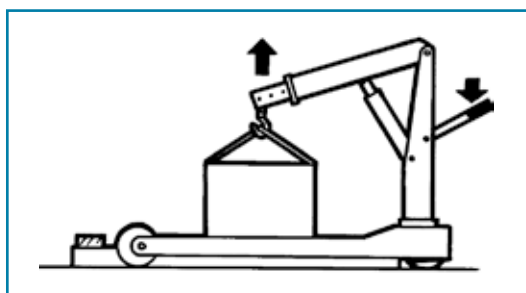
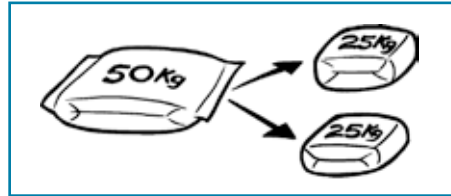


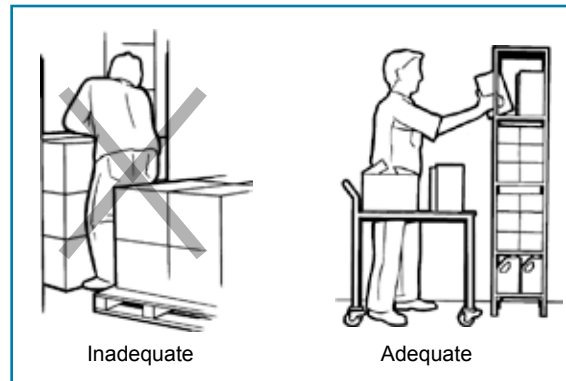
Illustration 9. Divide the load into smaller loads



### Working environment

For example, provide adequate space for handling objects, improve lighting, reduce the effects of adverse climatic conditions, improve floor surfaces, reduce noise and other distractions and provide adequate ventilation.

Illustration 10. Provide adequate space for handling objects



Maintenance of the working environment and equipment is essential for safe performance of manual tasks. An adequate hazard reporting system and preventative maintenance program will help to ensure equipment and the working environment are kept safe.

### Systems of work, work organisation and work practices

Reducing the risks that stem from systems of work, work organisation or work practices may involve modifying several factors such as for how long an activity is carried out (duration), how often and quickly the activity is performed (frequency) and how the activity is done. These elements make up the design of a job.

Strategies to design safe jobs and work practices include the following.

- (i) **Safe duration and frequency** – jobs should be designed to ensure that workers adopt a wide variety of actions and postures and reduce intense periods of forceful exertion and repetitive movement.

Options to achieve safe durations and frequencies include:

- rotation of workers through other tasks that require different actions and postures; and/or
- redesigning the job to include different actions and postures as part of daily routine.

- (ii) **Safe work rates and job demands** – work performance varies between individuals and over time, and can be influenced by work and equipment factors.

In determining safe work rates and job demands, some of the factors that need to be considered are:

- how often, how quickly and for how long the activities of a task are performed;
- the force required to complete the activities;
- the quality of work required;
- the type of work and equipment;
- the training that has been received;
- the skills, knowledge and experience of workers; and
- physical differences between people (eg size and strength).

Bonus and incentive schemes may encourage workers to work beyond their individual capacities and should be reviewed regularly if they are in place.

Machine pacing poses a risk if the pace is too fast or too slow. If machine pacing cannot be eliminated, then enabling workers to control the flow of work and buffer zones are effective ways to reduce the risk from machine pacing.

The use of electronic monitoring to pace employees' work is not recommended as it can cause individual employees to work at rates beyond their capacity, placing them at risk.

Some of the limitations of electronic monitoring for assessing work performance are that it fails to take into account factors such as:

- human variation;
- variations in equipment performance;
- capacity of the worker;
- variation in the period of time taken to reach an optimum level of skill; and
- quality of work.

**(iii) Mix of activity and task breaks** – where a task requires a long period of repetitive actions or fixed postures, and it is not possible to vary the types of activity in the task, breaks should be provided. These breaks should be made up of other tasks that do not require similar actions and postures to be performed. The length and frequency of breaks will depend on the type of activities that make up the tasks and job.

**(iv) Peak demand** – many activities have predictable peak periods with wide variations in work demand. Increased risks from performing manual tasks during these peak periods can be prevented by providing sufficient people and equipment to cope during times of increased work.

**(v) Working hours** – it may be necessary to determine whether the type of manual task being performed is suitable for extended hours or shifts. Work that is heavy, repetitive, demanding or involves vibration may need further consideration.

See also the Commission's *Code of practice: Working hours* for further information.

**(vi) Special individual needs** – it can be particularly important to provide suitable work patterns for workers with special needs. For example, injured workers returning to work may require their work patterns to be modified.

### Question 3: Can administrative controls be applied to control the risk?

Administrative controls include the provision of information, training, supervision and, where relevant, personal protective equipment. Policies and procedures may also be developed to assist in managing the risk.

Risk management training and task specific training should be provided to assist in the prevention of musculoskeletal disorders from performing manual tasks.

Both types of training should take on a participatory approach and be competency based, so that participants are able to demonstrate their understanding of the key training elements and develop problem solving skills in relation to hazardous manual handling tasks.

It is important that refresher training is offered as part of an ongoing manual task injury risk control program. The frequency of refresher training programmes should be determined relative to the level of risk established in completed risk assessments. For instance, high risk tasks such as handling patients will require more frequent updates than lower risk tasks, such as office based management positions with varied activities.

### Risk management for manual tasks

#### When should training on risk management for manual tasks take place?

Training should take place:

- during induction training; and
- as part of an on-going manual task risk control program.

**Who should attend?**

Everyone involved in organising and implementing manual task processes where hazards have been identified.

**Elements of training**

The level, length and type of training provided should be tailored and comparable to the risk involved and the role of the participants involved in the risk management process. Any training should focus on the specific problems identified in the assessment process and take on a participatory approach. Depending on the degree of risk, participants should have an understanding of some or all of:

- the key sections of the OSH Regulations relating to manual tasks and this code of practice;
- the role and responsibilities of the employer, workers and others and the consultation which should take place between employer and workers in order to identify hazardous manual tasks, and to assess and control risks;
- basic function of the spine, body postures, types of muscle work and principles of levers;
- the relationship between the human body and risk of injury from performing manual tasks;
- the activities included in manual tasks and the types of injuries that can result;
- risk factors and potential sources of risks of hazardous manual tasks;
- the risk management approach to manual tasks; and
- the application of relevant control strategies (eg purchasing and using appropriate equipment).

**Task specific training****When should task specific training take place?**

Task specific training should take place:

- during induction to the task;
- as part of refresher training; and
- when work tasks are about to be changed or introduced.

**Who should attend?**

Those workers and self-employed people required to undertake the task.

**Results of training**

After training, participants should be able to:

- recognise the risks and the sources of risks associated with the manual tasks, and in consultation decide the best way to minimise them;
- prepare the workplace layout and environment to perform manual tasks safely;
- prepare the load, where applicable;
- organise the task and work flow to minimise the risk of injury;
- select, adjust and use relevant mechanical aids and handling devices;
- select, adjust and use relevant tools and equipment; and
- perform and maintain safe work practices.



### 5.3 Finding solutions – Putting in controls

Some solutions may have application in other areas of the workplace. Both the cost and the benefits of changes can then be shared.

Easy solutions that are available and practical should be implemented immediately regardless of the priority given to the task.

An action plan can also be useful. This could include short term (up to four weeks), medium term (four weeks to six months), or long term (more than six months) strategies. Solutions for each activity should be given a time frame for completion. The *Risk control and follow up Form* (Appendix 3) has provision to include a completion date for each agreed control.

### 5.4 Where to from here?

You should have now agreed on the strategies required to adequately control the risks associated with performing manual tasks in your workplace. Once you have determined which control strategies will be implemented immediately, and have developed an appropriate action plan for longer term implementation, you can proceed to *Follow up and review*.

## 6. Follow up and review

Follow up is an important consideration to support the risk management plan. It involves finding out whether the changes made have eliminated or reduced the assessed risks, whether control strategies are continuing to be effective and ensuring that new risks have not been introduced into the workplace as a result of implementing a control.

### 6.1 Three stages of follow up

The follow up can be carried out after the risk control strategies have been completed (see also Appendix 3). Findings of the follow up process should be documented alongside the controls that have been implemented so that records can be easily tracked.

The follow up may involve:

#### 1. Consultation with workers, supervisors and safety and health representatives involved in manual tasks

It is important to talk to a range of workers, so that different levels of experience and physical characteristics are taken into account. Information collected should include:

- whether the controlled manual task or activity is resulting in reduced physical strain or difficulty;
- where controls have resulted in new problems; and
- where controls have made any existing problems worse.

#### 2. Looking at tasks

When looking at tasks:

- observe each changed activity to determine whether the initial risk factors have been minimised as intended; and
- assess the changes to ensure that no new hazards have been introduced.

Apply the checklist for risks (see Appendix 2) associated with manual task injuries.

#### 3. Monitoring injury reports

Monitor accident reports to:

- ensure problems have been resolved;
- check whether control strategies have been used; and
- analyse injury data for any new trends in manual task injuries.

Once follow up information is obtained, the questions that can be answered are:

- is further risk assessment necessary;
- are control strategies operating effectively; and
- are new strategies now available to be applied?

Employers and supervisors need to be kept up to date with new technology, industry standards and guidelines for reducing risks associated with performing manual tasks.

If new problems have occurred, or if there has been a change to the work requirements or equipment used, then a further risk assessment (Step 2) may be required.

Appendix 1: Step 1 Manual tasks: Hazard identification form (example)

Manual task no./name	How identified Note the methods of identification include: <ul style="list-style-type: none"> <li>• reported hazard or injury/illness;</li> <li>• consultation; and</li> <li>• inspection or observation.</li> </ul>	Risk factors(s) of concern Note the risk factors of concern, such as: <ul style="list-style-type: none"> <li>• awkward postures;</li> <li>• sustained postures;</li> <li>• repetitive movement;</li> <li>• forces and loads;</li> <li>• vibration;</li> <li>• working environment;</li> <li>• systems of work; and</li> <li>• worker characteristics.</li> </ul>	Location/ group/ occupation at risk	Number of workers at risk	General comments	Order of priority	Date of risk assessment
No. Name:							
No. Name:							
No. Name:							
No. Name:							
No. Name:							

**Appendix 2: Step 2 Manual tasks: Risk assessment form (example)**

Use this checklist to help understand why performing the task is a problem.

Location/group	Manual task (No. )		
Date of assessment:	Assessors/people involved:		
Risk factors to consider	Level of risk	Sources of risk	Comments
Refer to the information in Appendix 4 of this code of practice for guidance.	Estimate the level of risk each risk factor poses. ie: <ul style="list-style-type: none"> <li>• n/a;</li> <li>• low;</li> <li>• medium; or</li> <li>• high.</li> </ul>	Note the possible source(s) of risk, ie: <ul style="list-style-type: none"> <li>• work area/layout;</li> <li>• nature of the load;</li> <li>• nature of item, equipment, tool;</li> <li>• working environment; or</li> <li>• systems of work, work organisation or work practice.</li> </ul>	Make notes on reasons for your assessment.
<b>Actions and postures</b>			
Do the actions and postures involve:			
Holding loads or arms away from trunk			
Reaching upwards or load handling above shoulder height			
Bending the back or neck forwards or handling below mid-thigh height			
Twisting the back, neck or upper body			
Sideways bending or load handling on one side			
Long carrying distances			
Sudden jerky, rapid or unexpected movements			

Risk factors to consider	Level of risk	Sources of risk	Comments
Bending hands or wrists forwards, to the side or twisting			
Reaching behind or over reaching in any other direction			
Crawling, kneeling, crouching, squatting, lying or semi-lying			
Twisting or wringing using fingers or hands			
Maintaining the same posture for prolonged periods			
Repeating similar movements or actions			
<b>Forces and loads</b>			
Are the forces and loads handled:			
Heavy			
Bulky, large or awkward			
Difficult or uncomfortable to grasp or hold			
Unstable, unbalanced or unpredictable			
Harmful or fragile			
A person or animal			
Sudden, jerky, rapid or unexpected			
Involving strenuous lifting, lowering or carrying			

Risk factors to consider	Level of risk	Sources of risk	Comments
Requiring strenuous pushing or pulling			
Involving sustained application of force or grip			
<b>Vibration</b> Does the work involve:			
Driving for long periods			
Driving on rough roads			
Frequent use of hand powered tools or use for long periods			
Using high grip forces or awkward postures when using power tools			
Use of machines or tools where the manufacturer's handbook warns of vibration			
Workers being jolted or continuously shaken			
Use of a vehicle or tool not suitable for the environment or task			
<b>Working environment</b> Is there in the working environment:			
Constraints on postures or movement			
Rough or slippery floors			
Variations in levels or uneven ground			
Adverse climatic conditions eg cold, hot, wind, ice or humidity			

Risk factors to consider	Level of risk	Sources of risk	Comments
Poor lighting			
Narrow or obstructed thoroughfares			
Poor ventilation			
Distracting or loud noises			
<b>Systems of work, work organisation and work practices</b>			
In the working environment do workers:			
Find activities to be too long, too fast or too frequent to maintain			
Have difficulty in maintaining levels of physical work			
Frequently need to meet tight deadlines			
Experience inadequate activity variation or inadequate task breaks			
Experience sudden changes in workload eg seasonal changes			
Experience lack of control over work rate or demands			
Have bonus or incentives schemes, which may cause unsafe work rates			
Have performance monitored closely and continuously			
Undertake a flow of work that does not minimise handling, repetitive movement or sustained postures			
Require high levels of concentration and attention			

Risk factors to consider	Level of risk	Sources of risk	Comments
Undertake long or extended work hours or shifts			
<b>Worker characteristics</b> Does the job:			
Involve young or older people			
Involve workers who are pregnant or who have recently given birth			
Involve workers with physical limitations or special needs			
Require special skills, capabilities or knowledge			
Require protective equipment or clothing that is limiting			
Involve workers with language or cultural barriers			



Appendix 3: Step 3 Manual tasks: Risk control and follow up form (example)

Location/group:		Manual task (No. ):			
<b>Short term (up to four weeks)</b>					
<b>Action required</b>	Person responsible	Completion date	Review date	Comments on review	
<b>Medium term (four weeks to six months)</b>					
<b>Action required</b>	Person responsible	Completion date	Review date	Comments on review	
<b>Long term (more than six months)</b>					
<b>Action required</b>	Person responsible	Completion date	Review date	Comments on review	

## Appendix 4: Guidance material for rating risk factors

Use this information to assist in filling out the risk assessment form (Appendix 2)

### 1. Actions and postures

This section reviews actions and postures used while performing manual tasks. Awkward postures, sustained postures and repetitive movement are of particular concern.

An awkward posture is one in which any part of the body is in an uncomfortable or bent and twisted position. Awkward postures become particularly hazardous if they are extreme or when they are coupled with forceful exertion, repetitive movement or sustained postures.

Sustained postures are those positions where the whole body or parts of the body are held for prolonged periods of time. Muscular fatigue, strain and discomfort are common problems associated with sustained postures. Prolonged sitting and standing are also associated with blood flow problems. Sustained postures become particularly hazardous if part of the body is in an awkward position.

'Repetitive movement' means using the same parts of the body to repeat similar movements over a period of time. Performing repetitive movement without an adequate number and period of pauses and rest breaks lead to risky conditions. The risk becomes more significant if the repetitive movement also involves awkward postures or forceful exertion.

When assessing the risk of injury from each factor in this section, the overall rating should take into account the effect of how often the task is performed and for how long the task is performed each time.

#### 1.1 Holding loads or arms away from the trunk

Holding or carrying a load away from the body requires more muscular effort and places more stress through the joints than when holding the same load very close to the body.

Picking up a load further away from the body can mean the handling of the object is not controlled.

Accurately placing the load further away from the body will tire the muscles holding the load, due to the need for more careful control over its movement.

#### 1.2 Reaching upwards and handling a load above shoulder height

Reaching above shoulder height usually means the back is arched, neck bent backwards, and arms act as long levers. The load is more difficult to control and greater stress is placed around the shoulder joint, neck and back.

The risk of injury increases the higher the load is above shoulder height.

Lowering from this level to a level below mid-thigh height can require a change of grip.

#### 1.3 Bending back or neck forwards and handling the load below mid-thigh height

Bending forward to pick up loads from a low level creates strain, particularly on the lower back.

#### 1.4 Twisting the back or neck

The back is least able to take the stress caused by excessive twisting in repeated movements or prolonged posture. The combination of twisting and bending forward to handle a load increases the risk further and increases the likelihood of injury or cumulative damage to tissue.

#### 1.5 Sideways bending or load handling on one side

Lifting and carrying loads in one hand places more stress on the side of the body.

#### 1.6 Long carrying distances

Carrying a load for an excessive distance increases muscle fatigue, particularly in the arms. This can affect an individual's ability to carry out other handling activities afterwards.

### 1.7 Sudden jerky, rapid or unexpected movements

Sudden jerky, rapid or unexpected movements can produce strain as the body has not had adequate time to adopt the best position or to allow the muscles to contract to protect the body.

### 1.8 Bending hands or wrists forwards or to the side

Bending the hands or wrists forward or to the side places the body in an awkward posture, increasing the strain on joints and ligaments and reducing the force that can be applied by the arms.

### 1.9 Reaching behind

Reaching behind the back places the back, neck and shoulders in an awkward posture, increasing the risk of injury to these joints and the muscles that control the movement.

### 1.10 Crawling, kneeling, crouching, squatting, lying or semi-lying

These positions place the body in awkward postures, making it more difficult to apply force and placing greater strain on the joints.

### 1.11 Twisting or wringing using fingers or hands

These actions and postures place the hands and wrists in extreme positions and can cause strain to the tendons and ligaments of the upper limb.

### 1.12 Maintaining the same posture for long periods

Maintaining the same posture for prolonged periods can cause muscular fatigue and reduce blood flow to the muscles, increasing the risk of injury and strain.

### 1.13 Repeating similar movements or actions

Repeating similar movements can cause muscular fatigue and tendon strain increasing the risk of injury.

## 2. Forces and loads

This section looks at factors related to forceful exertion and the characteristics of loads being handled.

Forceful overexertion may occur during activities such as lifting, carrying, lowering, pushing, pulling and restraining. Generation of a high level of force is not always necessary for a strain injury to occur. One such example is when smaller muscles are involved in completing a task. Forceful overexertion can also result when a person is exposed to rapid or sudden speed changes such as jerky or unexpected movements while handling an item or load, because the body must suddenly adapt to the changing force.

### 2.1 Heavy

Evaluating the risks associated with the weight of an object should take into account many factors including:

- the length of time the load is handled;
- how often the load is handled;
- what position the load is handled in; and
- how easy it is to grasp the load.

There are no established safe lifting weight limits for a population because the ability to lift loads varies greatly between individuals, and is influenced by many factors including the shape, stability and ease of grasping the load, the environment and how the load is handled. The risk of injury increases even further when loads are handled in a sitting position, as the forces can only be controlled by the upper body. A safe load to lift will also vary for individuals depending on how far the load is held away from the trunk and how high or low the load is handled in relation to their waist level.

## 2.2 Bulky, large or awkward

The shape of the load can affect the way it can be held. For example, the risk of injury will be greater if a load has to be lifted from the ground and is wider than the distance between the knees.

A large load may block the view when carried and increase the chance of a person tripping or walking into obstacles.

## 2.3 Difficult or uncomfortable to grasp

Loads become more difficult to grasp when they don't have handles, are smooth, slippery, greasy or wet, or handles are uncomfortable to use (eg sharp edges). The extra grip and effort required will be tiring for the person and can increase the chance of the load being dropped.

## 2.4 Unstable, unbalanced or unpredictable

Loads with shifting contents (eg drums half full of liquid) make control of the load more difficult, and may lead to sudden additional body stresses for which the person may not be fully prepared.

A load where one side or one part is heavier than others will cause uneven muscular strain. This will be worse if the heavier part cannot be carried close to the body.

## 2.5 Harmful or fragile

The risk of injury increases when handling loads that are:

- sharp or rough;
- hot or cold; or
- fragile.

These factors may cause injury (eg cuts or burns), impair grip or discourage good posture when being handled.

## 2.6 Handling a person or animal

Handling people who cannot assist, are unable to bear weight, or are uncooperative, will increase the risk of injury. Live animals being lifted or restrained may suddenly move or pull away, placing extra stress on the back.

## 2.7 Sudden jerky, rapid or unexpected forces

Sudden jerky, rapid or unexpected forces can increase the risk of injury because muscles are not prepared for work and joints may be strained with the forces involved. For example, using a staple gun that kicks back or lowering a load with a second person when the other person lowers unexpectedly. Hitting, kicking, throwing, catching or jumping are other examples of such forces.

## 2.8 Strenuous lifting, lowering or carrying

The risk of injury increases when strain is experienced during a lift, lower or carry. Strain may be experienced not only when loads are heavy and awkward but also when they are performed repeatedly or for prolonged periods.

## 2.9 Strenuous pushing and pulling

The risk of injury increases when strain is experienced during pushing and pulling. Initial forces to move an object are greater and may involve higher risk than those required to keep an object moving. The forces can also be greater when trying to stop a load that is already moving (eg stopping a heavy trolley). Pulling a load whilst moving usually requires an individual to face the opposite direction to which they are moving or requires an individual to reach backwards and twist to pull a load. Pushing and pulling across the front of the body puts a twisting strain on the body, which can also lead to an increased risk of injury.

## 2.10 Sustained application of force or grip

Maintaining a forceful grip or sustaining a force increases the risk of muscular fatigue and tendon strain.

### 3. Vibration

This section reviews exposure to vibration.

The risk of injury increases the longer and/or more often a worker is exposed to vibration.

Vibration is considered a risk factor in manual tasks because the vibration can lead to micro-trauma of body tissue, muscular fatigue and a worker may need to exert more force to handle or use items that vibrate. The risk of injury depends on the characteristics of the vibration, including the magnitude, frequency, duration and direction.

#### 3.1 Whole-body vibration

Whole-body vibration occurs when a worker is in contact with a vibrating surface such as a seat or the floor in heavy vehicles or machinery. Prolonged exposure increases the risk of lower back pain, degeneration of the lumbar vertebrae or disc herniation.

#### 3.2 Hand-arm vibration

Hand-arm vibration occurs when vibrations are transferred to the hands and/or arms either from a tool or from steering wheels or controls in heavy machinery. This can result in disrupted circulation to the hands and damage to nerves, muscles and joints of the hands and arms.

### 4. The working environment

This section examines the influence of the work environment on the risk of manual task injury.

#### 4.1 Constraints on posture or movement

For space constraint to be a risk, it needs to impose a restriction on a person's ability to perform a manual task. Restricted head room will promote a stooping posture, obstructions may increase the need for twisting or leaning, and narrow gangways will hinder manoeuvring of bulky loads.

Performing manual tasks in confined spaces often requires the worker to adopt sustained awkward postures. Adequate ventilation, comfortable temperatures and adequate lighting may also be compromised in these areas.

#### 4.2 Rough or slippery floors

Uneven or slippery floors increase the likelihood of slips, trips or falls. They may also hinder smooth movement and create additional unpredictability. Uneven floor surfaces can hinder the safe use of trolleys.

#### 4.3 Variations in levels or uneven ground

The presence of steps or steep slopes adds to the difficulty of movement when handling loads, particularly when the load obscures a person's view.

Carrying a load up or down a ladder will be difficult due to the need to have a proper hold on the ladder.

#### 4.4 Adverse climatic conditions

The risk of injury increases with higher and colder temperatures, high humidity, wind, rain or icy conditions.

Working in cool environments has been associated with musculoskeletal disorders. Lower temperatures can not only affect blood flow and nerve function, but can also reduce the flexibility of muscles and soft tissue. Additionally, wearing heavy protective clothing in cold environments may restrict movement, sensation and handling ability when performing a manual task.

Working in high air temperatures can have an effect on sweat production, blood pressure, metabolic rate and core body temperature. Working in a combination of high humidity and heat levels reduces evaporation of sweat and cooling of the body. Additionally, wearing protective clothing in hot environments may increase the risk of overheating, as the clothing may not allow heat or sweat to dissipate off the body and may restrict movement, sensation and handling ability when performing a manual task.

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 and lower temperatures, the resultant wind chill factor may lower the body temperature further.

Rain, ice and hail may increase the risk of an injury by altering the postures adopted by the worker as floors may become slippery. Visibility may also be affected while the manual task is being performed. The cold temperatures associated with ice may also affect hand dexterity (hand coordination and mobility) and increase the risk of the development of musculoskeletal disorders.

#### 4.5 Poor lighting

Lighting should suit the task being performed in the work environment as well as the person performing the task.

Lighting characteristics that should be considered include:

- illumination levels;
- direction of lighting relative to manual task;
- reflection;
- glare; and
- colour.

Poor illumination may increase the risk of an injury while performing a manual task due to the worker not being able to see trip hazards. Workers may also be unable to position themselves well relative to the task and to place items safely. Low or high levels of lighting may also lead to awkward or sustained postures, such as leaning forward to either improve viewing or to avoid glare when working on the computer.

#### 4.6 Narrow or obstructed thoroughfares

Narrow or obstructed thoroughfares, such as narrow doorways and walkways with closed doors, can hinder the way in which manual tasks are performed. Tasks, such as housekeeping and cleaning performed in narrow or obstructed thoroughfares, can involve awkward postures such as reaching or bending over obstacles and increases in forceful exertions.

#### 4.7 Poor ventilation

Inadequate indoor ventilation may increase the risk of several short term and long term health problems, depending on whether dust, fumes, chemical or biological agents are present in the air. A common short term symptom includes increased risk of fatigue, increasing the risk of injury.

#### 4.8 Distracting or loud noises

Loud noise may interrupt communication between workers performing manual tasks. This may be a source of risk during handling. For example, while transferring a patient in a busy and noisy emergency department, handlers may have difficulty in accurately communicating the direction or type of transfer they are going to use.

Random intermittent noise may also interrupt concentration during a manual task, and this may be an added source of mental demand on the worker, which may subsequently increase muscular tension.

### 5. Systems of work, work organisation and work practices

This section examines the influence of systems of work, work organisation and work practices on the risk of manual task injury.

#### 5.1 Job demands and control

The risk of injury increases when there is a mismatch between the demands of a task or job and the capability of the worker to meet those demands at that time.

## 5.2 Task design

The design of tasks will have an impact on the demands of the job. The flow of work and tasks should be designed so that risk factors, such as repetitive activity, forceful exertions, sustained postures and prolonged exposure to vibration, are minimised.

## 5.3 Work load

Risks may arise when workers find difficulty meeting the demands of the work, either because they have difficulties maintaining current levels of physical work or they are not able to alter the pace of work to suit their abilities.

Remuneration methods may have an influence on the workload taken on by individuals. Systems of work that provide incentives may encourage workers to skip breaks, to finish later than usual or to produce more items in a set time. Monitoring workers' performance by electronic or other forms of monitoring is not recommended as it can lead individual workers to work at rates beyond their capacity.

## 5.4 Task duration, frequency and variety

Inadequate task variation or inadequate breaks from tasks requiring similar actions contributes to the risk of a musculoskeletal disorder. Where an activity requires long periods of repetitive actions, fixed postures or completing different tasks with similar physical demands, muscular fatigue and the potential to develop an injury is increased.

## 5.5 Pace of work and time constraints

Pace of work and time constraints, such as high workloads, tight deadlines and lack of rest breaks, may lead to muscular fatigue and increase the risk for the development of musculoskeletal disorders.

## 5.6 Peak demand

Many activities have predictable peak periods or seasons, with associated increases in work loads. Planning ahead for such situations is helpful. Planning and implementing back up resources for unpredictable peak demands can help reduce the strain placed on workers for such periods.

## 5.7 Working hours

Some types of manual tasks, such as work that is heavy, repetitive or demanding, may not be suitable for extended hours or shifts. See also the Commission's *Code of practice: Working hours*.

## 5.8 Support in the workplace

Insufficient levels of support in terms of physical resources (eg equipment), staffing levels for assistance, training/supervision, co-worker support and supervision may be risks associated with development of musculoskeletal disorders.

## 6. Worker characteristics

This section relates to risk factors related to the person(s) performing the task.

### 6.1 Young and older persons

Young workers under the age of 18 are at greater risk than adult workers because they are still developing physically and their spine and other joints are more easily damaged. Older workers may not have the range of movement, fitness level or muscular strength that they may have had in the past. These changes, as part of the process of ageing, may pose as a hazard for some, but not all, older workers.

### 6.2 Pregnant women or those who have recently given birth

The risk of injury increases as pregnancy progresses.

Hormonal changes can affect ligaments, increasing susceptibility to injury. Postural problems may increase as the pregnancy progresses. Difficulty in getting a load close to the body can be a particular problem. Care should also be taken for women who may handle loads following a return to work during the first three months after childbirth.

### **6.3 Special needs and physical limitations**

The risk of injury increases with decreased physical ability.

Workers returning to work after injury may not be able to perform at their normal level of work.

Specific disabilities and illnesses, for example scoliosis and osteoarthritis, may affect a person's ability in manual tasks.

Workers returning from an extended absence may have a reduced level of fitness for physical work.

Occasional heavy manual handling may place extra demands on workers who normally carry out lighter tasks like office work.

### **6.4 Special skills, capabilities and knowledge**

The risk of injury may increase where a greater degree of special skills, capabilities and/or knowledge is required.

Some manual task activities (eg patient handling) require very specific skills and knowledge to perform.

### **6.5 Personal protective clothing and equipment (PPE) that hinders movement or posture**

The risk of injury may increase from the use of PPE and some types of clothing.

Tight clothing that restricts movement will adversely affect manual task technique.

Where PPE must be worn, its effect on injury risk should be considered. For example, gloves may reduce ability to grip loads firmly. The weight of gas cylinders used with breathing apparatus will increase the stresses on the body.

### **6.6 Language or cultural barriers**

Workers with language barriers may have difficulty understanding information, training and supervision. They may also have difficulties conducting manual tasks within a team without adequate language translation.

Cultural difference may also alter the way in which tasks are conducted and how issues may be raised or communicated.



## Appendix 5: Other sources of information

### Legislation

The *Occupational Safety and Health Act 1984*:

- Section 19 Duties of employers
- Section 20 Duties of employees
- Section 22 Duties of persons who have control of workplaces
- Section 23 Duties of manufacturers, etc
- Section 23D Contract work arrangements
- Section 23E Labour arrangements in general
- Section 23F Labour hire arrangements

Occupational Safety and Health Regulations 1996

The above are available online at State Law Publisher's website: [www.slp.wa.gov.au](http://www.slp.wa.gov.au). They may also be purchased by telephoning (08) 9426 0000.

The *National code of practice for the prevention of musculoskeletal disorders from performing manual tasks at work* has not been endorsed as a code under section 57 of the OSH Act, however, it is a valuable source of information. It can be downloaded from the Safe Work Australia website (see below).

### Contacts for further information

#### WorkSafe

Department of Commerce  
Westcentre, 1260 Hay Street West Perth  
PO Box 294 West Perth WA 6872  
Tel: 1300 307 877  
Fax: (08) 9321 8973  
National Relay Service: 13 36 77  
Email: [safety@commerce.wa.gov.au](mailto:safety@commerce.wa.gov.au)  
Web: [www.worksafe.wa.gov.au](http://www.worksafe.wa.gov.au)

#### Safe Work Australia

GPO Box 641 Canberra ACT 2601  
Web: [www.safeworkaustralia.gov.au](http://www.safeworkaustralia.gov.au)

#### Chamber of Commerce and Industry Western Australia

180 Hay Street East Perth WA 6004  
Tel: (08) 9365 7415  
Fax: (08) 9365 7550  
Email: [osh@cciwa.com](mailto:osh@cciwa.com)  
Web: [www.cciwa.com](http://www.cciwa.com)

#### UnionsWA

Level 4, 445 Hay Street Perth WA 6000  
Tel: (08) 9328 7877  
Fax: (08) 9328 8132  
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