



# Presenter's guide

## Preventing injuries from manual tasks in the workplace - A risk management approach

To present this workshop, the presenter must be familiar with the contents of this guide and have an interest in manual tasks. It is desirable for the presenter to have some background knowledge about manual tasks, manual task injuries, how the human body works, and risk management for manual tasks. For example, it would be beneficial if the presenter has participated in past training/education relevant to some or all of the above topics. This would allow the presenter to be better able to answer questions that may arise from participants.

The workshop has been designed to run for three hours.

## Introduction

This guide contains information about the workshop, background information for the presenter and additional resource documents to be used during the workshop.

This guide has been designed to be used in conjunction with the 'Preventing injuries from manual tasks in the workplace: a risk management approach' power-point presentation. Notes for each power-point slide have been presented in this guide and provided under the 'notes' section of each power point slide.

### Legend



Presenter's information



Background information



Case study

The workshop has been designed to run for three hours, the first two hours being the power point presentation, and the third hour being the group activities.

The contents of the workshop has been detailed in a workshop plan (please refer to Appendix 1 for a copy of the Workshop Plan). Presenters are encouraged to modify the Workshop Plan to suit their audience and style.

To present this workshop, the presenter must be familiar with the contents of this guide and have an interest in manual tasks. It is desirable for the presenter to have some background knowledge about manual tasks, manual task injuries, how the human body works, and risk management for manual tasks. For example, it would be beneficial if the presenter has participated in past training/education relevant to some or all of the above topics. This would allow the presenter to be better able to answer questions that may arise from participants.

This training program has been designed to be interactive, where participants learn to problem solve manual task issues during activities (refer to Appendix 2 for Workshop Resources) and learn how to apply the risk management approach for potentially hazardous manual tasks (see Appendix 3 for Manual Tasks Risk Management Forms). The training should be competency based (where participants are able to display their knowledge of key elements of the programme) and the principles of adult learning should be applied.

This workshop forms part of the requirements for manual tasks training as outlined in the Commission for Occupational Safety and Health *Code of practice: Manual tasks (2010)*. It is not designed to replace practical or task specific training, but instead should be provided together with practical training. It should also be noted that depending on the individual workplace and the manual tasks completed within the workplace, more detailed information may be required than what is provided in this package.

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**Please note:** *Prior to the course please print*

### **Appendix 2: Who's Responsible?**

Print out enough forms for each participant.

#### **Case studies worksheets.**

Print out the case studies required, or print out scenarios specific to the participants' workplace. (One worksheet per participant).

### **Appendix 3: Manual Tasks Risk Management Forms**

Print out enough forms for each participant.

## Presenter's information



There are many manual tasks that contribute to the risk of injury. The best way to manage these risks is through a systematic process of hazard identification, risk assessment and risk control. So at the end of the workshop you should be able to use the guidance in the Commission for Occupational Safety and Health *Code of practice: Manual tasks (2010)* to reduce manual task risks.

The occupational safety and health legislation is concerned with the employer reducing the risk of injury in consultation and cooperation with the workforce. So at the end the workshop the participants should know what the role they can play in reducing manual tasks risks.

### Slide two



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Purpose of this workshop

At the end of this workshop you should be able to:

- Identify, assess and control manual task risks in a systematic manner
- Understand the role of the employer and workers in this process



## Background information

### Aims of the workshop

The workshop provides participants with the knowledge and skills to effectively identify hazards, and assess and control risks arising from manual tasks. Recognising that the participants' roles may only be to contribute to this process, the workshop also discusses the employer's obligations towards involving workers in this process.

This workshop forms part of the requirements for manual tasks training as outlined in the Commission for Occupational Safety and Health *Code of practice: Manual tasks (2010)*. It is not designed to replace practical or task specific training, but instead should be provided together with practical training. It should also be noted that depending on the individual workplace and the manual tasks completed within the workplace, more detailed information may be required than what is provided in this package.

The Code explains that after training, participants should be able to recognise manual handling risks in tasks, and in consultation, decide the best way to minimise them.

Therefore by the end of the workshop, participants will be able to:

1. provide the definition of manual tasks;
2. explain in general terms the legal requirements; and
3. discuss and apply the process of managing risks associated with manual tasks in their workplace.



### Specific Learning Outcomes

- To understand what is meant by the term ‘manual tasks’ and how they cause injury
- To understand the relevant legal requirements
- To apply the principles in the Commission for Occupational Health Code of practice: Manual tasks to identify, assess and control risks.

### Slide three

- Specific Learning Outcomes**
- To understand what is meant by the term “manual tasks” and how they cause injury
  - To understand the relevant legal requirements
  - To apply the principles in the Code of Practice: Manual tasks (2010) to identify, assess and control risks.



### Background information

#### Assessment criteria

In order to determine if the learning outcomes have been met, the ability of participants to recognise manual handling risk should be assessed in the workplace.



*This can be used as an ‘icebreaker’ to stimulate discussion.*

Research has shown that just teaching workers in so-called ‘safe lifting techniques’ is not effective in reducing the number of injuries that occur.

Why do you think this is the case?

Some reasons:

- Injuries are caused by more than just lifting. They can also be caused by pushing, pulling, holding, carrying, awkward postures etc. That is why we talk about manual tasks.
- There are many situations where the nature of the job or the work environment is such that you cannot adopt a ‘safe lifting technique’.
- There are lots of things that you do over a working day that involve performing what we call manual tasks. Some may involve little or no risk, others may be high risk. To sort through all these tasks requires a systematic approach.
- Training specific physical techniques in a classroom is not easily transferred to real-life situations, and it doesn’t actually prevent cumulative loading on the body.
- Lots of things can contribute to the risk. Often there can be lots of simple things that workers could suggest to reduce the risk. Therefore it is important for workers to understand how they may either eliminate or reduce the risks that exist to begin with.

### Slide four

**Why this approach?**

What is wrong with teaching people to lift safely?

## Definitions



### Background information

#### Manual tasks

The Commission for Occupational Health *Code of practice: Manual tasks (2010)* defines **manual tasks** as '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.'

#### 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;

- 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.

#### Slide six



#### Manual tasks

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#### Definition

Any activity or sequence of activities that requires a person to use their physical body (musculoskeletal system) to perform work

#### Slide seven



#### Hazardous Manual Tasks

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Many things that workers do involve performing activities that can be considered to be manual tasks.

The term *hazardous manual tasks* is used to describe those that have the potential to cause injury

#### Slide eight



#### Examples of manual tasks

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## The legal framework

### Relevant legal requirements



#### General duty of care

At the 'heart' of the legal framework is the general duty of care. This is contained in Section 19 of the *Occupational Safety and Health Act 1984*. It places a duty on the employer to provide and maintain a work environment in which workers are not exposed to hazards.

#### Reporting and investigation requirements

Section 20 of the Occupational Safety and Health Act 1984 places a duty upon workers to report injuries and any situation that may be a hazard that the worker cannot correct. So workers should be encouraged to report problems as they are required by the Act to do so.

After worker reports an injury of hazard, the employer is then required under Section 23(k) of the Act to investigate the matter and to report back to worker what they intend doing about it.

#### Risk management regulations

The employer is required to identify hazards that are likely to arise, to assess the risk and consider how the risks might be reduced. This requirement is contained in regulation 3.1 and 3.4 of the Occupational Safety and Health Regulations 1996.

#### Requirements to consult and co-operate

The employer cannot manage manual tasks risk without involving the workforce. Section 19 of the Act also imposes a duty upon the employer to consult and cooperate with workers regarding safety and health at the workplace.

If the workplace has Safety and Health Representatives, the employer must also consult with them on any intend changes that could affect workers' health or safety.

#### Codes of practice

Codes of practice give advice on how to comply with legal requirements. The Commission for Occupational Safety and Health *Code of practice: Manual tasks (2010)* specifically addresses the hazards and risks associated with manual tasks, and provides guidance on how to manage these in line with the OSH Act and Regulations.

#### Slide nine



#### Relevant Legal Requirements

- General Duty of Care
- Reporting & investigation requirements
- Risk management regulations
- Requirements to consult and co-operate
- Codes of Practice



**Background information**

The relevant legal requirements are as follows:

**Occupational Safety and Health Act 1984**

**19. Duties of employers**

- (1) An employer shall, so far as is practicable, provide and maintain a working environment in which the employees of the employer (the ‘**employees**’) are not exposed to hazards and in particular, but without limiting the generality of the foregoing, an employer shall — [...]
- (c) consult and cooperate with safety and health representatives, if any, and other employees at the workplace, regarding occupational safety and health at the workplace;

**35. Certain duties of employers in relation to safety and health representatives**

- (1) Where there is any safety and health representative for a workplace the employer shall — [...]
- (c) consult with safety and health representatives on intended changes to the workplace or the plant or substances used at the workplace where those changes may reasonably be expected to affect the safety or health of employees at the workplace;

**20. Duties of employees**

- (1) An employee shall take reasonable care —
  - (a) to ensure his or her own safety and health at work; and
  - (b) to avoid adversely affecting the safety or health of any other person through any act or omission at work.
- (2) Without limiting the generality of subsection (1), an employee contravenes that subsection if the employee — [...]
- (d) fails to report forthwith to the employee’s employer —
  - (i) any situation at the workplace that the employee has reason to believe could constitute a hazard to any person that the employee cannot correct; or
  - (ii) any injury or harm to health of which he or she is aware that arises in the course of, or in connection with, his or her work.

**23K. Duty to inform employee who reports a hazard or injury**

- (1) This section applies where an employer receives from an employee a report of a kind described in section 20(2)(d).
- (2) The employer must, within a reasonable time after receiving the report —
  - (a) investigate the matter that has been reported and determine the action, if any, that the employer intends to take in respect of the matter; and
  - (b) notify the employee of the determination so made.

## **Occupational Safety and Health Regulations 1996**

### **3.1. Identification of hazards, and assessing and addressing risks, at workplaces**

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 —

- (a) identify each hazard to which a person at the workplace is likely to be exposed;
- (b) assess the risk of injury or harm to a person resulting from each hazard, if any, identified under paragraph (a); and
- (c) consider the means by which the risk may be reduced.

### **3.4. Manual handling**

- (1) In this regulation —  
**manual handling** means any activity requiring the use of force exerted by a person to lift, lower, push, pull, carry or otherwise move, hold or restrain a person, animal or thing.
- (2) Without limiting regulation 3.1, a person who, at a workplace, is an employer, the main contractor or a self-employed person must, as far as practicable —
  - (a) identify each hazard that is likely to arise from manual handling at the workplace;
  - (b) assess the risk of injury or harm to a person resulting from each hazard, if any, identified under paragraph (a); and
  - (c) consider the means by which the risk may be reduced.

Before looking at the processes for managing manual task risks, it is important to gain some background information on the anatomy of the spine, body postures, types of muscle work, and the principles of biomechanics.

## Injuries from manual tasks



The most frequent injury that occurs from manual tasks is sprains and strains. These most commonly occur in a person's back, however they can also affect the neck, shoulder, elbow, wrist and knee.

Joint injuries may develop over time. Arthritis in the back and frozen shoulder are examples of these.

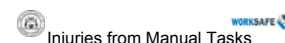
Disc injuries in the spine can include what's often called a 'slipped disc'. The disc doesn't actually slip out, but parts of a disc may bulge out of place, coming into contact with the nerves that run very close to spine. This can cause pain, muscle weakness and different sensations such as pins and needles or numbness. Discs can also degenerate over time, causing pain when the bones of the spine are too close together, creating friction between the spine and the muscles, ligaments and nerves around it.

An example of a nerve injury is carpal tunnel syndrome, which is often associated with doing work that is repetitive in nature.

Disorders affecting muscles and blood circulation typically occur from exposure to vibration – for example a disorder called 'vibration induced white finger'.

Soft tissue injuries might include grazes, bruises and crush injuries from completing manual tasks.

### Slide ten



- The types of injuries that can result from performing manual tasks include:
- Sprains/ strains – muscles, ligaments & tendons
  - Injuries or chronic pain affecting joints
  - Disc injuries of the back or neck
  - Injury to or compression of nerves
  - Disorders affecting muscles or blood circulation
  - Soft tissue injuries



### Background information

Manual task injuries are usually sprains or strains to muscles, tendons, ligaments and joints, and have been associated with overexertion or physical stress while handling loads. These conditions are sometimes referred to as 'Musculoskeletal Disorders.'

It is not only heavy lifting that can lead to manual task injuries. Jobs that involve repetitive or forceful movements (eg using a screwdriver), or working in awkward positions for a long time (eg an electrician working in a confined roof space) can lead to cumulative strain. The injury does not occur at one specific moment, but is the cumulative effect of the regular strain and fatigue on muscles and ligaments.

Manual tasks are also associated with occupational overuse syndrome [OOS] (formerly known as RSI) which refers to a range of conditions characterised by discomfort or persistent pain in muscles, tendons and other soft tissues usually in the arms. Jobs which involve repetitive movement of the wrists or hands, such as packing produce, sorting on a production line, or keyboarding can place workers at risk of developing an overuse type injury.

### How injuries occur



Gradual wear and tear can occur when a person is participating in frequent or prolonged manual tasks. Over time, exposure to high risk postures, movements or forces can result in injury.

Sudden damage can occur when a person is performing an intense, strenuous or awkward manual task – for example, lifting a very heavy load in a confined space.

An example of direct trauma from unexpected events may be when a person is carrying a large object and trips and falls, or is hit by a falling object when performing a manual task.

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##### How injuries occur

Injuries can occur from:

- Gradual wear and tear
- Sudden damage
- Direct trauma from unexpected events

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### Scope and cost of injuries from manual tasks

#### Cost of manual task injuries



Manual task related lost time injuries are the most common types of lost time injury. In some areas such as the health industry they account for approximately half of all lost time injuries.

*Manual tasks also result in some of the most severe injuries in terms of the time it takes before the worker is able to return to work, with one in every 4 workers who have suffered a manual task related lost time injury taking 3 months or more before they are able to return to work.*

*So consider – from an individual worker's viewpoint: Back injuries do not attract the same publicity that say amputations get. But if you suffer a serious back injury what would be the effect on your quality of life?*

*(continued over page)*

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##### Cost of Manual Task Injuries

1 in every 3 lost time injuries is a result of performing manual tasks.

1 in every 4 workers who suffers a manual task related lost time injury is off work for at least 3 months.

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*(continued from previous page for Slide 13)*

So consider – from a workplace viewpoint:  
If a worker is off for 3 months, how much more would it cost to employ a labour hire or casual/ contract worker?

How much less efficient would a labour hire/casual/ contract worker be than your own workers?

What are the additional costs of contract labour?  
Decreased efficiency of contract labour?



### **Background information**

#### **Scope of manual task injuries**

Manual tasks are the most common cause of lost time injuries. While the overall risk of work-related injury has decreased over the last 15 years the proportion of manual task injuries has increased from around 30% of all lost time injuries to over 37% of all lost time injuries.

After mental stress (which accounts for less than 3% of lost time injuries), manual task injuries involve the longest time off work. Around 1 in 25 workers who suffer a manual task lost time injury will be off work only a day and over 1 in 10 will be off work for at least 3 months.

NOTE: Additional statistical information may be obtained from WorkCover WA's *Workers' Compensation in Western Australia Statistical Reports* [[www.workcover.wa.gov.au](http://www.workcover.wa.gov.au)]. Manual task injuries are included in these reports as a 'Mechanism of injury' referred to as 'body stressing.'

## Anatomy and biomechanics



Knowledge on anatomy and biomechanical principles provides the basis for a better understanding of what happens to the body during a manual task.

*Topics covered are:*

- anatomy of the spine
- body positions & postures
- types of muscle work
- some basic biomechanical principles
- the relationship between the human body and risk of injury.

### Slide thirteen



Anatomy & biomechanics



- Anatomy of the spine
- Body positions & postures
- Types of muscle work
- Principles of biomechanics
- The relationship between the human body and risk of injury

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### Background information

This information is included here to provide presenters with some background to questions asked in the Commission for Occupational Safety and Health *Code of practice: Manual tasks (2010)*. For example, why does the risk of injury increase as the load is held further away from the front of the body? Why does twisting increase the risk of injury? To answer these, it is important to consider:

- anatomy of the spine
- terminology of body positions
- posture
- types of muscle work
- some basic biomechanical principles
- the relationship between the human body and risk of injury



### Anatomy of the spine

The spine is made up of 33 small bones or vertebrae, divided into 3 areas.

Top 7 - cervical vertebrae;

Next 12 - thoracic vertebrae;

Next 5 - lumbar vertebrae.

The remaining vertebrae are fused to form the sacrum, with the coccyx at the end.

Looking from the front or the back, the vertebrae are stacked one on top of the other in a straight line. However, from the side, they form 3 spinal curves; the curve bends forwards in the neck, backwards in the thoracic area, and then forwards again in the lumbar area. Good posture involves maintaining these curves.

### Slide fourteen



Anatomy of the spine



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## Background information

### Anatomy of the spine

Each vertebra is separated from the next by a disc made of cartilage, which allows for movement of the spine and acts as a shock absorber.

Supporting the spine are tough ligaments which prevent any unwanted movement. Over these are the deep postural muscles. They are small muscles, running between a few vertebrae. Their job is to hold up the body against the influence of gravity. There are also larger back muscles over these which control the movement of the trunk and upper limbs.

Other important muscles in the function of the spine are the abdominal muscles. These 3 pairs of muscles form a broad band of muscle around the front of the trunk.



## Background information

### Terminology of body positions

#### Positions of the spine or trunk

Flexion – bending forwards  
Extension – bending backwards



### Trunk (spine) positions

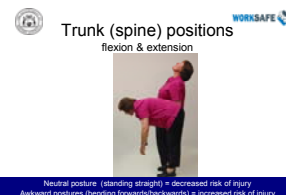
The trunk or back is in a neutral position when you are standing in a straight posture with your shoulders aligned over your hips and feet, with your head level and facing straight ahead.

Trunk or back flexion is when you are bending forwards

Trunk or back extension is when you are bending backwards

The human body prefers to be in a neutral posture where possible. It is when the body is in postures away from neutral postures that the risk of injury increases.

#### Slide fifteen





## Background information

### Terminology of body positions

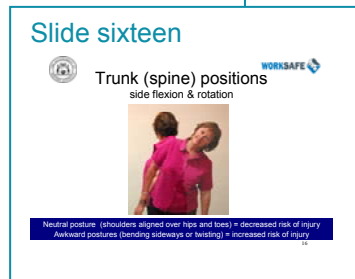
Sideways Flexion  
Rotation, twisting the spine.



### Trunk (spine) positions

Sideways flexion occurs when you are bending sideways (ie one shoulder is lower than the other)

Rotation is when you are twisting through your spine. An easy way to spot this is when your shoulders or head is facing a different direction than your hips or feet.



## Background information

### Terminology of body positions

#### Wrist positions

Wrist extension  
Neutral position  
Wrist flexion



### Wrist positions

Your wrist is in a neutral position when the hand and forearm are aligned.

Extension occurs when your hand moves upwards.

Flexion is when your hand moves downwards.

The wrist is in its strongest position when it is in a neutral posture. If a work task requires the wrist to be in extension or flexion, the risk of injury increases.





## Background information

### Terminology of body positions

Hand and forearm positions

Palm down - Pronation

Palm up - Supination



## Hand & forearm positions

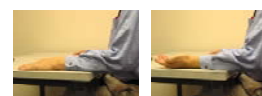
The neutral posture for the forearm is the 'handshake' position, when your arm is at the midpoint between the palm facing up and palm facing down. This neutral posture is also called the power position, as when in this posture, the forearm is at its strongest.

Pronation is the term for when your palm faces down. Supination is the term for when your palm faces up.

When in the extremes of pronation or supination, the muscles of the forearm and hand are not able to work in their ideal position, and thus are at increased risk of injury, as they do not have the same strength compared to being in the neutral posture.

### Slide eighteen

 Hand & forearm positions  
pronation & supination



Neutral posture (hand at mid-range, 'handshake' position) = decreased risk of injury  
Awkward postures (hand palm up or palm down) = increased risk of injury



## Background information

### Posture

Posture involves maintaining the 3 spinal curves described previously. In this position, the spine is under least stress, and the muscles are at their strongest.

As posture deviates from this, there is extra tension placed on all the structures of the spine. Twisted or bent postures in particular mean increased stress and increased risk of injury.

Many of the recommendations in the Commission for Occupational Health *Code of practice: Manual tasks (2010)* such as storing heavier and frequently used items at approximately waist level, help ensure the worker is able to maintain a good posture while doing manual handling.

Maintaining a neutral wrist and forearm posture is also important for workers undertaking repetitive hand and arm movements.



## Types of muscle work

*Dynamic work* - muscle contraction and movement of a body part. Eg. The action of lifting stock and placing it on a shelf is an example of this. The shoulder muscles contract and raise the arms.

*Dynamic action* - the blood pumped to the muscle flows through the muscle, flushing out the lactic acid and carbon dioxide (waste products of muscle work). Thus the chemical balance of the muscle is maintained, and it can work for lengthy periods without discomfort. That said, over longer periods of time, if the dynamic muscle work involves repetitive movements, this can increase the risk of injury.

*Static work* - muscle contraction, but no movement of a body part occurs. Eg. A mechanic bending over to work in a car engine. The flexed posture of the spine is held there by the back muscles working statically.

*Static action* - the sustained muscle contraction acts like a tourniquet on the blood vessels. This results in a loss of blood flow to the working muscle and a build-up of the waste products in the muscle itself. The chemical imbalance is detected by the brain as discomfort, fatigue or heaviness. This occurs even after very short periods of static muscle work, and can increase the risk of injury.

Many risk factors in the Code of practice are listed because they are examples of static muscle work. An example is static muscle work for the shoulders and arms in carrying loads over long distances.

Many tasks involve both static and dynamic muscle work. In the example of the mechanic working in a car engine, there is static work for the back muscles and dynamic work for the wrist and forearm muscles as he/she uses tools.

## Slide nineteen

### Types of muscle work

- Dynamic  
Muscle contraction & movement.
- Static  
Muscle contraction & no movement.

Static muscle work (prolonged standing, sitting, holding hand/arm in one position) = increased risk of injury  
REPETITIVE dynamic muscle work over time = increased risk of injury



## **Background information**

### **Types of muscle work**

Muscles work in two different ways, dynamically or statically. Put simply, dynamic muscle action involves muscle contraction and movement of a body part. The action of lifting stock and placing it on a shelf is an example of this. The shoulder muscles contract and raise the arms.

Static muscle work involves muscle contraction, but there is no movement of a body part. An example is a mechanic bending over to work in a car engine. The flexed posture of the spine is held there by the back muscles working statically.

The body reacts differently to the two types of muscle work.

In dynamic muscle work, the blood pumped to the muscle flows through the muscle flushing out the lactic acid and carbon dioxide (waste products of muscle work). Thus the chemical balance of the muscle is maintained, and it can work for lengthy periods without discomfort. That said, if the dynamic muscle work involves highly repetitive actions over an extended period of time, this can increase the risk of occupational overuse injury.

In static muscle work, the sustained muscle contraction acts like a tourniquet on the blood vessels. This results in a loss of blood flow to the working muscle and a build-up of the waste products in the muscle itself. The chemical imbalance is detected by the brain as discomfort, fatigue or heaviness. This occurs even after very short periods of static muscle work.

Many risk factors in the Commission for Occupational Health *Code of practice: Manual tasks (2010)* are listed because they are examples of static muscle work. An example is static muscle work for the shoulders and arms in carrying loads over long distances.

Many tasks involve both static and dynamic muscle work. In the example of the mechanic working in a car engine, there is static work for the back muscles, and dynamic work for the wrist and forearm muscles as he/she uses tools.

## Principles of biomechanics



### Principles of biomechanics

For our bodies to move, the muscles have to pull on the bones of our arms, legs and back. The bones are therefore like levers.


A weight at a short distance from the body requires less effort to move than the same weight at a longer distance from the body, where the lever arm is longer.

When lifting a load, the closer it is to the person's body, the less stress there is on the body, and therefore the lower the risk of injury.

If the load is further away, there is greater strain on the person handling the load.

The distance between the person and load is caused by a variety of factors, such as the layout of the work area, a cluttered floor making access difficult, or the large dimensions of the item held.

### Slide twenty

Principles of biomechanics 



Load close to body = decreased risk of injury




Load further from body = increased risk of injury



### Using the spine as a crane

The spine can sometimes be used as a lever, although it was not designed to be used like a crane. The spine becomes a very long lever arm, with a load being handled at the end. The muscles of the back have to support not only the weight of the load being handled, but also the weight of the trunk as it is bent over. The force exerted by the spinal muscles can be up to ten times greater than the weight of the load handled.

### Slide twenty one

Using the spine as a crane 



Load further from body = increased risk of injury

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### Principles of biomechanics to protect your back

- A wide base of support means having your feet well spaced and keeping your centre of gravity low and between your feet
- Know what you're lifting, how much it weighs, and get a good grip before you lift
- Maintain the back in a neutral posture – ie avoid twisting, bending forwards or bending backwards.
- Keep the load close to the body, so your body isn't acting like a lever, increasing the force and stress on the body
- Use the stronger larger muscles of your legs to create force where possible – they are better equipped to cope with the load. For example, when pushing – start the movement from your legs, not from your back
- Smooth movements are less likely to result in injury than jerky, fast or sharp movements
- Your back is more stable if you engage your stomach muscles and back muscles to support the back before moving



### Principles of biomechanics to protect shoulders and wrists:

- The shoulder is at its strongest and safest when the upper arm is close to the side of the body. When reaching above shoulder height, below knee height, forwards or backwards, there is increased risk of injury to the shoulder
- Avoid twisting through the shoulder, forearm or wrist
- Avoid holding one position for long periods of time. This creates static loading on the muscles and increases risk of injury
- Avoid repetitive movement
- Avoid long distance carrying

### Slide twenty two



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#### Principles of Biomechanics: Back

- Obtain a wide base of support for stability
- Become familiar with the load and try to get a good grip of the load.
- Maintain neutral curves of spine
- Maintain load close to body
- Use the stronger larger muscles of the legs to create force where possible
- Execute smooth, controlled movement
- Stabilise the back by using abdominal muscles and deep back muscles where possible.

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### Slide twenty three



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#### Principles of Biomechanics: Shoulders & Wrist

- Avoid work where the upper arm is away from the side of the body
- Avoid twisting
- Avoid holding one position for long periods of time
- Avoid repetitive movement
- Avoid long distance carrying
- Try to maintain the wrist and forearm in neutral postures

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## Relationship between the human body and injury

There is a relationship between how humans use their bodies to do work, and the risk of injury.

The human body prefers to be in a neutral posture where-ever possible, because this is where muscles work most efficiently and are at their strongest.

In the back, this means maintaining the 3 natural curves of the spine. We have also discussed the neutral postures for the wrist, hand, and forearm. Once the body is using awkward postures, which is any posture away from 'neutral' (eg bending forwards or twisting the spine), the risk of injury increases.

Muscles also prefer to have variety – they like to be moving, rather than holding a body part still. That said, they DON'T like to be performing the same movement over and over again. If the human body is performing too much static muscle work, OR highly repetitive dynamic work for extended periods, this also increases the risk of injury.

The human body is exposed to forces all day, every day. When these forces are high/ intense or cumulative or unexpected, the risk of injury increases. Cumulative forces might include exposure to vibration, or when manual tasks are completed continually over long periods of time (with or without high forces)

## Slide twenty four



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### Relationship between the human body and the risk of injury

The risk of injury increases when:

- The body is using awkward postures, rather than preferred neutral postures
- Muscles are involved in static work (contraction without movement) or in highly repetitive movements
- The body is exposed to high/intense (one-off), cumulative (ongoing) or unexpected forces

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So we know now that there is a relationship between the human body and risk of injury. Where does this risk of injury come from?

There are a number of sources of risk that create these human body conditions, where there is increased risk of injury.

The work area design or layout can contribute to a person using awkward postures. For example, if a store room is over crowded with stock, a person may be bending forwards and reaching over boxes to get to a carton at the back, creating an awkward posture. If the layout of a work area is such that a person needs to carry an item over a long distance, this results in increased use of static postures, when the shoulder muscles are working to carry the box, but is not actually moving.

The item, equipment or tool that a person uses in their work tasks can also contribute to injury in that they could require someone to use an awkward posture. For example, something very large and bulky may make it difficult to maintain neutral postures of the shoulder, forearm and wrist. They could also result in static muscle work in holding the item, or the tool itself could expose a person to forces (jackhammer use exposes a person to vibration, while requiring static muscle work to grip the controls).

The nature of the load also creates risk for injury. For example, if the 'load' is a person (eg nurses helping a patient move), this is an unpredictable, heavy and awkward load, that may result in the worker adopting unsafe postures and being exposed to unexpected forces.

The working environment can also contribute to injury. Muscles work less effectively and are more prone to injury in cold conditions, so workers in cool rooms are more at risk of injury. Similarly, if a workplace is not well lit, there is increased risk of a worker tripping while carrying a load, exposing them to unexpected forces.

Systems of work, work organisation and work practices can also contribute to workers being exposed to risk from repetitive muscle work, use of prolonged postures or other risks related to how work is completed, what breaks are provided, and how much variety is offered.

## Slide twenty five



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Where does this risk come from?

The sources of risk that create these body conditions where injury may occur include:

- Work area design and layout
- Nature of the item, equipment or tool
- The nature of the load
- The working environment
- Systems of work, work organisation and work practices

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***Take a 10 minute break after slide twenty-six***



### **Background information**

Using this background information, we now return to look at the Commission for Occupational Health *Code of practice: Manual tasks (2010)* in detail, explaining how to use it to identify hazards, and assess and control manual handling risks in the workplace.

# The Commission for Occupational Health *Code of practice: Manual tasks (2010)*



The Commission for Occupational Health *Code of practice: Manual tasks (2010)* sets out general principles and practical methods for managing potential problems associated with manual tasks in the workplace, so an employer can comply with the requirements of the manual handling regulations. The Code recommends a three step approach.

- Step 1.** Hazard Identification (spotting the problem)
- Step 2.** Risk Assessment (understanding the problem)
- Step 3.** Risk control (dealing with the problem)

But don't forget the final step of 'Follow up and review'. This is the review of controls that have been put in place to make sure they're effective in reducing or eliminating the risk. It's also the time to look at whether the controls have introduced any new hazards into the workplace, so that these can be dealt with.

Slide twenty six

Code of Practice: Manual Tasks

- Step 1. Hazard ID (spotting the problem)
- Step 2. Risk Assessment (understanding the problem)
- Step 3. Risk control (dealing with the problem)

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## Background information

### Risk Management Approach to Manual Tasks

The Code recommends a three step approach.

- Step 1.** Hazard Identification (spotting the problem)
- Step 2.** Risk Assessment (understanding the problem)
- Step 3.** Risk control (dealing with the problem)

But don't forget to 'Follow up and review'. This is the review of controls that have been put in place to make sure they're effective in reducing or eliminating the risk.

It's also the time to look at whether the controls have introduced any new hazards into the workplace, so that these can be dealt with.

This training package details how to undertake these steps, and gives practical examples of what employers can do to reduce the risk of musculoskeletal injuries to workers from performing manual tasks.

While this workshop provides training for organisations to do this process 'in house', in some instances outside consultants will be called in. They should be made aware of the consultative nature of the process, as specified in the Act, and should be allowed to talk to workers, supervisors and safety and health representatives.

It is important to keep written records of the process. The forms included with this package can be used for this purpose.

## Risk Management – Legal Framework



### Step 1. Hazard Identification (spotting the problem)

Regulations 3.1(a) and 3.4(2)(a) requires the employer, the main contractor or a self-employed person to identify each hazard that is likely to arise from manual tasks at the workplace, as far as is practicable.



### Step 2. Risk Assessment (understanding the problem)

Regulations 3.1(b) and 3.4(2)(b) requires the employer, the main contractor or a self-employed person to assess the risk of injury or harm (if any) to a person resulting from each hazard identified within manual tasks, as far as is practicable.



### Step 3. Risk control (dealing with the problem)

Regulations 3.1(c) and 3.4(2)(c) requires the employer, the main contractor or a self-employed person to consider the means by which the risk (from hazards in manual tasks) may be reduced, as far as is practicable.

Additionally, Section 19 (1) of the Act requires employers, as far as is practicable, to provide and maintain a working environment in which employees are not exposed to hazards.

#### Slide twenty seven



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##### Code of Practice: Manual Tasks Step 1. Hazard Identification (spotting the problem)

Regulations 3.1(a) and 3.4(2)(a) requires the employer, the main contractor or a self-employed person to identify each hazard that is likely to arise from manual tasks at the workplace, as far as is practicable.

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#### Slide twenty eight



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##### Code of Practice: Manual Tasks Step 2. Risk Assessment (understanding the problem)

Regulations 3.1(b) and 3.4(2)(b) requires the employer, the main contractor or a self-employed person to assess the risk of injury or harm (if any) to a person resulting from each hazard identified within manual tasks, as far as is practicable.

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#### Slide twenty nine



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##### Code of Practice: Manual Tasks Step 3. Risk control (dealing with the problem)

Regulations 3.1(c) and 3.4(2)(c) requires the employer, the main contractor or a self-employed person to consider the means by which the risk (from hazards in manual tasks) may be reduced, as far as is practicable.

Additionally, Section 19 (1) of the Act requires employers, as far as is practicable, to provide and maintain a working environment in which employees are not exposed to hazards.

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## Hazard Identification (spotting the problem)



The remainder of the workshop details these three steps and gives practical examples of what employers can do to reduce the risk of manual handling injuries to workers.

So, what is hazard identification? Simply put, it's working out which parts of a manual task could result in an injury. Spotting hazards is a way of collecting information and determining if there's any patterns within tasks, so that manual tasks can be made safer. There are four stages of hazard identification.



**Stage 1** of hazard identification involves the analysis of injury, incident and hazard reports. This will show where injuries are occurring, and if there is a pattern in their occurrence.



**Stage 2** involves consultation with workers.

- Talk to the supervisors and workers doing the job. They may be able to tell you specific aspects which cause them problems or makes the task more difficult.
- Talk to the safety and health representatives or committees who may have information on any problems from manual tasks.



**Stage 3** involves looking at the manual tasks. You will need to look at the work area and see the task(s) actually being performed to gain a good understanding of the postures and movements used, environment, layout and equipment that is available.

### Slide thirty



#### Hazard identification

##### What is it?

- The process of identifying factors within a manual task which could result in injury.

##### Why do we do it?

- To collect information and look for trends on risk factors within manual tasks.

### Slide thirty one



#### Hazard identification process

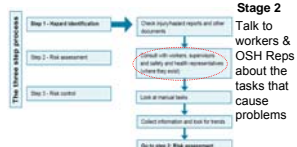


**Stage 1**  
Look for where injuries / hazards are occurring

### Slide thirty two



#### Hazard identification process

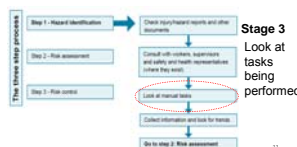


**Stage 2**  
Talk to workers & OSH Reps about the tasks that cause problems

### Slide thirty three



#### Hazard identification process



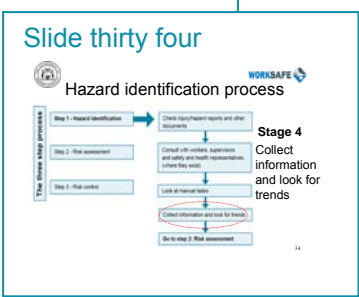
**Stage 3**  
Look at tasks being performed



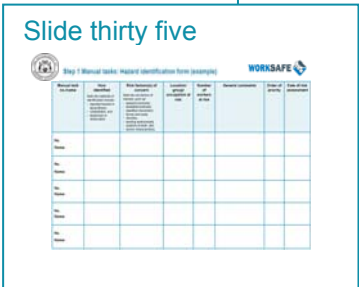
**Stage 4** is where it all comes together. Collect information from the first three stages under the headings:

- Tasks performed
- Age and sex of workers
- Occupation
- Geographical location
- Type of injury; and
- Any other relevant information

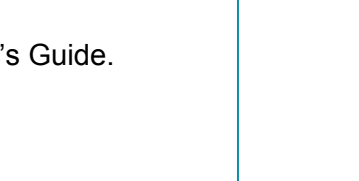
Once the information is collated, look for trends across the above areas. Common trends or high risks within the above areas will help to identify which tasks are higher priority, potentially hazardous and require a risk assessment.



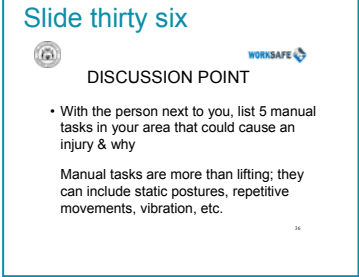
The information you have collected can be summarised on the manual task hazard identification form found in Appendix 1 of Commission for Occupational Health *Code of practice: Manual tasks (2010)*



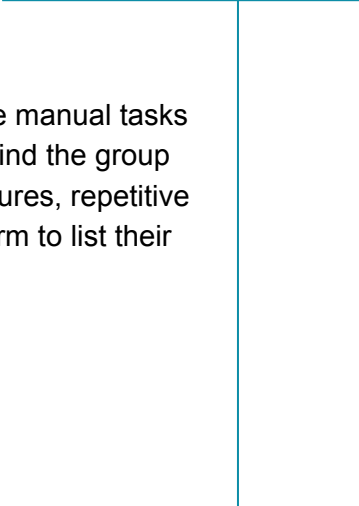
**Background information**  
Blank copies of the form are provided in Appendix 3 of this Presenter's Guide. Provide copies of this form to all participants at this point.



Prompt participants to work together to list manual tasks in their work area that could cause an injury. Use the provided form to document their list.



**Background information**  
**Hazard ID Discussion Point:**  
Ask the group to break up into pairs, and work together to identify five manual tasks together that could cause an injury in their work area, and why. Remind the group that manual tasks is more than just lifting, and can include static postures, repetitive movements, vibration, etc. Prompt the groups to use the provided form to list their tasks.



## Risk assessment (understanding the problem)



### What is it?

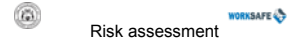
- The process of determining which identified factors within a manual task have potential to cause injury, and why.

### Why do we do it?

- To determine appropriate ways of dealing with hazards.

There are three stages of Risk Assessment.

### Slide thirty seven



#### What is it?

- The process of determining which identified factors within a manual task have potential to cause injury, and why.

#### Why do we do it?

- To determine appropriate ways of dealing with hazards.

## Risk Assessment: The 3 stage process

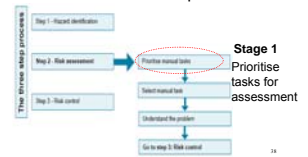
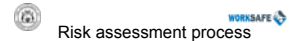


**Stage 1** Prioritise which manual handling tasks to assess using the matrix.

The matrix gives a guide to determining which task is the most risky, based on the likelihood of injury and the severity of those injuries. It is only one step of completing a risk assessment and should not be used as a stand alone tool.

*It can be used to prioritise manual tasks for assessment.*

### Slide thirty eight

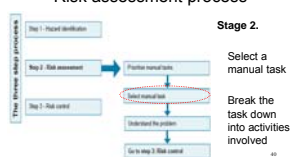
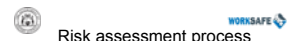


### Slide thirty nine



CONSEQUENCE	LIKELIHOOD			
	Very Likely	Likely	Unlikely	Highly Unlikely
Fatality	HIGH	HIGH	HIGH	MEDIUM
Major injuries	HIGH	HIGH	MEDIUM	MEDIUM
Minor injuries	HIGH	MEDIUM	MEDIUM	LOW
Negligible injuries	MEDIUM	MEDIUM	LOW	LOW

### Slide forty



**Stage 2:** Select the highest priority manual handling task and break it down into its components.

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.

Each activity can then be checked for risks in terms of loads, forces, actions, postures, characteristics of people doing the work

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

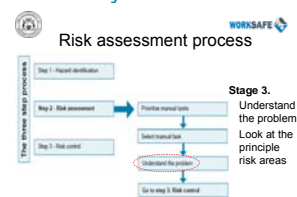


**Stage 3:** Look at all the risk factors under the following headings:

- Actions and postures;
- Forces and Loads handled;
- Vibration;
- Working environment;
- Systems of work; and
- Characteristics of workers performing the task.

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.

### Slide forty one



### Background information

It is important to consider **all** risk factors – don't jump to early conclusions.

The package includes a risk assessment form to complete for each manual handling task assessed. It includes a level of risk for each factor, from low to high. The following information taken from the Code will assist in determining the level of risk for each activity.

## Risk factors



- Holding loads or arms away from trunk
- Reaching upwards or handling loads above shoulder height
- Bending back or neck forwards and handling loads below mid-thigh height
- Twisting the back or neck
- Sideways bending or load handling on one side
- Long carrying distances



- Sudden, jerky, rapid or unexpected movements
- Bending hands or wrists forwards or to the side
- Reaching behind
- Crawling, kneeling, crouching, squatting, lying or semi-lying
- Twisting or wringing using fingers or hands
- Maintaining the same posture for long periods
- Repeating similar movements or actions



### Background information

#### Actions and postures

Consider the actions and postures used while performing manual tasks; awkward or 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.

#### Slide forty two



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##### Risk Factors: Actions and Postures

- Holding loads or arms away from trunk
- Reaching upwards or handling loads above shoulder height
- Bending back or neck forwards and handling loads below mid-thigh height
- Twisting the back or neck
- Sideways bending or load handling on one side
- Long carrying distances

#### Slide forty three



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##### Risk Factors: Actions and Postures

cont....

- Sudden, jerky, rapid or unexpected movements
- Bending hands or wrists forwards or to the side
- Reaching behind
- Crawling, kneeling, crouching, squatting, lying or semi-lying
- Twisting or wringing using fingers or hands
- Maintaining the same posture for long periods
- Repeating similar movements or actions

## PREVENTING INJURIES FROM [MANUAL TASKS IN THE WORKPLACE](#)

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.

### **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.

### **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.

### **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.

### **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.

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

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

### **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.

### **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.

### **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.

### **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.

### **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.

### **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.

### **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.

### **Repeating similar movements or actions**

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



- Heavy, bulky, large or awkward
- Difficult or uncomfortable to grasp
- Unstable, unbalanced or unpredictable
- Harmful or fragile
- Handling animals or people
- Sudden, jerky, rapid or unexpected forces
- Strenuous lifting, lowering or carrying
- Strenuous pushing and pulling
- Sustained application of force or grip

#### Slide forty four



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##### Risk Factors: Forces and loads

- Heavy, bulky, large or awkward
- Difficult or uncomfortable to grasp
- Unstable, unbalanced or unpredictable
- Harmful or fragile
- Handling animals or people
- Sudden, jerky, rapid or unexpected forces
- Strenuous lifting, lowering or carrying
- Strenuous pushing and pulling
- Sustained application of force or grip



### **Background information**

#### **Forces and loads**

Consider the 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.

### **Heavy loads**

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.

### **Bulky, large or awkward loads**

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.

### **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.

### **Unstable, unbalanced or unpredictable loads**

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.

### **Harmful or fragile loads**

The risk of injury increases when handling loads that are:

- Sharp or rough;
- Hot or cold; or
- Fragile.

## PREVENTING INJURIES FROM **MANUAL TASKS IN THE WORKPLACE**

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

### **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.

### **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.

### **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.

### **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.

### **Sustained application of force or grip**

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



#### **Vibration**

- Whole body vibration
- Hand arm vibration

#### **Environment**

- Posture or movement constraints
- Rough or slippery floors
- Uneven ground or variation in levels
- Adverse climatic conditions
- Poor lighting
- Narrow or obstructed thoroughfares
- Poor ventilation
- Distracting or loud noises

#### **Slide forty five**



##### **Risk factors : Vibration**

- Whole-body vibration
- Hand-arm vibration

##### **Risk factors : Work environment**

- Posture or movement constraints
- Rough or slippery floors
- Uneven ground or variation in levels
- Adverse climatic conditions
- Poor lighting
- Narrow or obstructed thoroughfares
- Poor ventilation
- Distracting or loud noises





## **Background information**

### **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.

### **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.

### **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.

## **The working environment**

Consider the influence of the work environment on the risk of manual task injury.

### **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.

### **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.

### **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.

### **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.

### **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.

### **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

## PREVENTING INJURIES FROM **MANUAL TASKS IN THE WORKPLACE**

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.

### **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.

### **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.



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

- Job demands and control
- Task design
- Work load
- Task duration, frequency and variety
- Pace of work and time constraints
- Peak demand
- Working hours
- Support in the workplace

### **Slide forty six**



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Risk Factors: Systems of work, work organisation, & work practices

- Job demands and control
- Task design
- Work load
- Task duration, frequency and variety
- Pace of work and time constraints
- Peak demand
- Working hours
- Support in the workplace



### **Background information**

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

Consider the influence of systems of work, work organisation and work practices on the risk of manual task injury.

#### **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.

### **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.

### **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.

Payment 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.

### **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.

### **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.

### **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.

### **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 for Occupational Safety and Health *Code of practice: Working hours*

[www.worksafe.wa.gov.au](http://www.worksafe.wa.gov.au)

### 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.



#### Worker Characteristics

- Young or older people
- Pregnant (or recently birthed) women
- Special needs and physical limitations
- Special skills, capabilities and knowledge
- Personal protective clothing & equipment
- Language or cultural barriers

#### Slide forty seven



WORKSAFE

Risk Factors: Worker characteristics

- Young or older persons
- Pregnant (or recently birthed) women
- Special needs and physical limitations
- Special skills, capabilities and knowledge
- Personal protective clothing & equipment
- Language or cultural barriers



### Background information

#### Worker characteristics

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

##### 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.

##### 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.

##### 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.

##### 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.

### **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.

### **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.

Based on the information above and the following form taken from Appendix 2 in the Code, information from the risk assessment can be summarised.



**Note:** Hand out the Risk Assessment Form to each participant. Use the risk assessment form for each manual handling task assessed. Rate each factor as 'not applicable', 'low', 'medium' or 'high', based on the information provided in Guidance material for rating risk factors (Appendix 4).

*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.*

*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 described.*

#### Slide forty eight



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Risk assessment process

Summarise the information on the risk assessment form



Prompt participants to work together to complete a risk assessment on ONE of the Manual tasks they listed earlier



Risk assessment form (Appendix 2, Code of Practice);  
*The completed risk assessment should provide a clear understanding of the principal risk areas for each activity and the potential sources of 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).



**Note to Presenter:**

The risk assessment form is provided in Appendix 3 of this guide.

After the groups have completed their forms, you may wish to ask 1-2 groups to present their assessment to the rest of the group, following Slides 51-55 on the screen.

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Slide forty nine

DISCUSSION POINT

- Go back to your list of manual tasks in your area that could cause injury
- With the person next to you, complete the risk assessment form provided to determine which risk factors need to be addressed

Slide fifty

Manual Tasks: Risk assessment form (example)

Task description	Control measures	Residual risk	Responsible person
...	...	...	...

Slide fifty one

Task description	Control measures	Residual risk	Responsible person
...	...	...	...

Slide fifty two

Task description	Control measures	Residual risk	Responsible person
...	...	...	...

Slide fifty three

Task description	Control measures	Residual risk	Responsible person
...	...	...	...

Slide fifty four

Task description	Control measures	Residual risk	Responsible person
...	...	...	...

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

## Risk Control (dealing with the problem)



### What is it?

Simply put, risk control is about making changes to a task, by eliminating or reducing risk.

### Why do we do it?

To make the job or task safer for workers and prevent/reduce injuries from manual tasks



Risk control should involve consultation with:  
Workers doing the manual handling tasks;  
Safety and health representatives; &  
Managers and supervisors.

As a group, brainstorm ideas about what changes could be made, and discuss the pros and cons of making these changes.

Decide which control or controls you will implement, and then review it to make sure it's working the way it should be!

### Slide fifty five



#### Risk Control



##### What is it?

The process of eliminating or reducing risk associated with identified and assessed risk factors

##### Why do we do it?

To make the job or task safer for workers and prevent/ reduce injuries from manual tasks

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### Slide fifty six



#### Risk control



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### The risk control process

Ask the following:

#### 1. Can the task be eliminated?

If the hazardous manual task is not necessary, then the task should be ceased, and the hazard therefore eliminated. For example, using automated conveyor lines to eliminate manual carrying of goods, or ceasing a task (such as polishing corridor floors) where the task poses a risk to workers, but is not a necessary task.

#### 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.

#### 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.

Manual task training is not only an administrative control, but is a separate requirement under the OSH Act

### Slide fifty seven



Risk control process



- Eliminate the hazardous manual task;  
or
- Redesign the load, work area, work practices or equipment to minimise the risk of injury;  
and
- Provide appropriate manual task training.

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The risk of injury can be controlled by changing a variety of aspects of the work, and the way in which the work is done by focusing on actions and postures, loads handled and the work environment. Strategies can look at:

- Modifying workplace layout and equipment;
- Modifying the load;
- Controlling the work environment; and
- Redesigning work patterns.

**Slide fifty eight**

**Risk control strategies**

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

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



### Modifying work area & layout

Modifying the workplace layout can affect the workers' postures. Examples of modifications include:

- selection of 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.

**Slide fifty nine**

**Work area & layout**



### Background information

#### Work area & layout

An example is to store heaviest items on shelves at waist height. This means that workers will handle the heavier loads in upright postures.

Modifying the workplace layout can also eliminate hazardous manual tasks. An example is moving equipment so that a pallet of goods can be transported directly to the storeroom thus avoiding the need to carry items from the pallet to the store.



Raising the height allows people to work in more upright postures.

**Slide sixty**

**Work area & layout**



The provision of mechanical handling equipment, together with appropriate training in its use, can reduce the handling risks.



### Background information

#### 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.

The provision of mechanical handling equipment, together with appropriate training in its use, can reduce the handling risks.

The Code gives many examples of manual handling equipment, from simple levers to cranes and hoists. The Yellow Pages is a useful source for locating suppliers of such equipment.

The *National Code of Practice for the Prevention of Musculoskeletal Disorders from Performing Manual Tasks at Work* also gives practical information on solutions to specific problems.



The provision of adjustable equipment for tasks requiring static postures over a period of time, together with appropriate training in its use, can reduce the risks associated with duration or poor postures.



Loads may be modified in various ways including:

- broken down into smaller weights,
- more manageable dimensions,
- labelled accordingly,
- packaged so that they are stable or
- packaged with handles

Slide sixty one

Nature of items, equipment and tools

Use levers to reduce the amount of force required

Slide sixty two

Nature of items, equipment and tools

Provide adjustable chairs for computer based tasks

Slide sixty three

Nature of the load

Repackage to reduce weight



### Background information

#### 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.

Loads can be re-packaged to reduce weight, or re-packaged to increase weight which is then handled mechanically. Another suggestion is to modify the load to include hand-holds.

#### Slide sixty four



##### Nature of the load

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Improving grip by providing hand holds



### Controlling the work environment

Examples of environmental changes include:

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

An adequate hazard reporting system can alert an employer to a hazard before an injury occurs.

A preventative maintenance program for equipment will also ensure that potential hazards are identified before they become a problem. A preventative maintenance program for trolley wheels is an example.

#### Slide sixty five



##### Working environment

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This foundry worker is at increased risk of injury due to the hot environment and protective clothing required. The hot item also requires the worker to hold the item away from the body



### Background information

#### 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.

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.



**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.

**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).

**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.

**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.

**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.

**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.

## Slide sixty six



### Systems of work, work organisation & work practices

WORKSAFE

Design safe jobs and work practices by considering the following:

- duration & frequency
- work rates and job demands
- mix of activity & breaks
- peak demand
- working hours
- special individual needs



## Background information

### 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).
  
- (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.

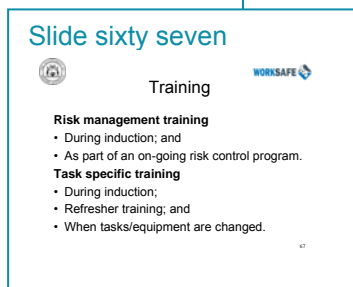
- (v) **Working hours** – it may be necessary to determine whether the type of manual task being performed is suitable for extended hours or shifts. Work that is heavy, repetitive, demanding or involves vibration may need further consideration.  
See also the Commission’s *Code of practice: Working hours*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



**Two types of manual handling training are needed – general training and task specific training.** *Both types of training should be interactive and 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*

**General risk management training.** This should occur at induction and as part of the on-going manual handling risk control program. Everyone who organises or does any hazardous manual handling task is required to attend such training.

**Task specific training.** This should occur during an induction to the task, as part of refresher training and when work tasks are changed as part of risk control measures.



## Background information

### Training

#### Risk Management Training

The level, length and type of general risk management 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 the Commission for Occupational Health Code of practice: Manual tasks (2010);
- 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;

## PREVENTING INJURIES FROM MANUAL TASKS IN THE WORKPLACE

- 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).

NOTE: This training workshop covers many elements as listed above.

### Task specific training.

Task specific training is for workers who undertake that specific manual handling task. Participants should be able to demonstrate their understanding of various aspects of the training, and this has been explained in the Commission for Occupational Health *Code of practice: Manual tasks (2010)*.

Training, be it general or task specific, however should not be considered the sole method of risk control.



Prompt participants to work together to discuss risk control strategies to address the risk factors that they found to be HIGH risk / high priority for their previously assessed manual task



It is extremely important to follow up on the changes that have been made as part of the risk control measures, to ensure that the changes have actually reduced the risk of injury and that no new hazards have been introduced.

*To do this:*

- Consult with workers, their supervisors and the safety and health representatives;
- Look at the tasks again; and
- Monitor any hazard, incident or injury reports

The Follow-up form from the Code of practice, Appendix G) gives a method of doing this.

### Slide sixty eight



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#### DISCUSSION POINT

- Go back to your completed risk assessment for the manual task in your area that you selected
- With the person next to you, discuss the appropriate control strategies to address the risk factors you discussed



## Background information

### 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.

The follow up can be carried out after the risk control strategies have been completed. 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 to determine 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** to observe whether the initial risk factors have been minimised as intended; and assess the changes to ensure that no new hazards have been introduced.
3. **Monitoring injury 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?
- 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.

The Risk Control form (from the Code of Practice, Appendix 3) notes how control measures can be implemented within specified time frames; and how they should be followed-up



### Finding solutions – Putting in controls

*The risk control form (from the Code of Practice, Appendix 3) notes how control measures can be implemented within specified time frames.*

### Slide sixty nine



## Background information

### Who's responsible?

At this stage in the workshop, some participants may be feeling a bit daunted by the whole process. They need to understand where they fit into the process. Who should instruct them to assess manual handling risks? Who do they report their findings to? Who is responsible for ensuring that the control measures implemented actually work?

The Commission for Occupational Health *Code of practice: Manual tasks (2010)* specifies who should be involved in the process, what consultation should occur, and what records should be kept. On completion of this workshop, participants should have the skills and knowledge to assess manual handling activities using the Code of Practice.

The Code of practice states:

- **Who should be involved?**

*When carrying out the three step approach one or more people should be involved, depending on the size of the workplace, for example, the area supervisor, safety and health representative, and the person doing the job.*

*Expert or specialist advice may be useful in making difficult or complex risk assessments (Step 2) and developing risk control procedures (Step 3). A person with an ergonomics background may be appropriate for helping to assess the risk, whereas a person with an engineering background may be more suitable for helping to control the risk.*

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

- **What consultation should take place?**

*Discussion should take place between the employer, workers who perform manual handling work and, where they exist, their safety and health representatives. This way, the day-to-day experiences and knowledge of workers can be used. This is a requirement under the Act*

- **Should records be kept?**

*Employers should give consideration to keeping records.*

*Keeping of records is part of good management for all activities in your workplace. This includes recording any assessment of the risks associated with manual handling and the resulting implementation of control measures. Such records are a valuable reference in the event of an injury being reported.*

*Good records can show that correct procedures were developed for the management of manual handling in the workplace. The material in this package could form the basis of these records.*

This part of the workshop, using the forms found in Appendix 2 of this guide, puts the process into perspective. A summary 'training record form' should be completed by the trainer and stored to show that workers are aware of manual task risk factors and the risk assessment process

After giving participants approximately 5 minutes to fill in the sheets, discuss the answers for their organisation. You may choose to substitute the case studies/examples provided with ones from your own workplace.

### Group Activity – Who's Responsible?



**This section looks at who initiates & implements the steps of the Code of Practice.**

#### ***Who should be involved?***

One or more people should be involved, depending on the size of the workplace, eg. the area supervisor, safety and health representative, and the person doing the job.

Expert or specialist advice may be useful in making difficult or complex risk assessments.

#### **What consultation is needed?**

Discussion should take place between the employer, workers who perform manual tasks and, where they exist, their safety and health representatives.

#### **Should records be kept?**

Yes. Keeping of records is part of good management for all activities in the workplace.

#### *Activity*

*Stop power point presentation & hand out copies of 'Who's Responsible' forms. Give participants approximately 5 minutes to fill in the sheet, then discuss the answers for their organisation. (15 minutes total). Let participants know that there may be more than one person responsible.*

#### *Practical - case studies.*

*Hand out case studies sheets (from Appendix 2 or examples from the participants' workplaces). Allow 40 minutes for them to discuss & report to the group. Return to the power point presentation.*

#### Slide seventy



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Group Activity: Who's responsible?

- Who should be involved?
- What consultation is needed?
- Should records be kept?

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## Case studies

This session gets the participants to put into practice the process of addressing manual handling problems, as outlined in the Commission for Occupational Health *Code of practice: Manual tasks (2010)*. It aims to make them confident in using the Code to address manual handling issues.

Work in small groups (2 - 4 people per group). Four worksheets of manual handling case studies are found in Appendix 2 of this guide. Use these, or choose a scenario specific to the participants' workplace. It can be an example of a job or tasks where someone sustained an injury, or a job or task which involves manual handling and which is considered to be a hazard.

Each group needs to discuss the case study, and then complete the risk assessment section. This should be done as a group, consulting with each other. After this, each group needs to fill in the risk control section, outlining in a few words the best options to eliminate or reduce the manual handling risks.

On completion, each group can report back on the major problems assessed, and their control measures. This should be short, not allowing participants to get side-tracked. The purpose is to ensure that they have understood the process, and can make reasonable judgements about the risks and appropriate control measures.

The completed case studies are included here, with the main risk factors and some suggestions for control. Worksheets of these case studies are found in Appendix 2.



## Case study 1

### Hazard identification (spotting the problem)

Pickers working in the warehouse have complained of sore lower backs and shoulders. On observation, their work involves taking order sheets clipped to a shopping trolley and walking around the racks, picking items to fill the order. They complain that they are often hindered by other pickers' trolleys and the forklifts which block the aisles while placing pallets on the upper racks.

The racks used by the pickers are 1.3 metres high. The heavier large items are just stored on pallets on the floor under the racks.

On completion of the order, the picker pushes the trolley to a work table, where items are unloaded, checked off and then stacked on a pallet on the ground. The products are then shrink-wrapped.

### Risk assessment (understanding the problem)

*Main points:*

- Lack of head room under the rack;
- Awkward reach to get to items stacked at the back of the pallets on the floor;
- Lifting above shoulder height to reach items on the rack;
- Lifting heavy loads from floor;
- Repetitive bending into the shopping trolley;
- Repetitive pushing of the trolley (over rough/sloping surfaces?);
- Double handling of items from shopping trolley to work table to pallet; and
- Obstruction from other trolleys and fork lifts.

### Risk control (dealing with the problem)

*Suggested measures:*

- Restrict the height of produce stores on the 1.3 metre high rack;
- Purchase pallet trolleys;
- Design a one-way system for traffic in the aisles;
- Check items as they are loaded onto the pallet on the pallet trolley; and
- Use pallet turntables for storage of items on pallets on the floor if sufficient space allows.



## Case study 2

### Hazard identification (spotting the problem)

A worker in an ice-cream parlour has developed an aching forearm in her dominant arm. Most of her work involves serving ice-cream in cones to customers. On observation, she uses a metal scoop, reaches into the display cabinet to the chosen tub of ice-cream, pushes through the hard ice-cream to obtain the required size of scoop, then stands up and places the scoop onto the top of a cone held in the non-dominant hand.

Her other duties include refilling the display cabinet with 5kg tubs of ice-cream, and cleaning out the cabinet at the end of the day. The cabinet opens only from the server's side.

### Risk assessment (understanding the problem)

*Main points:*

- Forceful repetitive action for her dominant arm scooping ice-cream;
- Reaching into cabinet holding full tubs of ice-cream; and
- Flexed postures and reaching while cleaning out the cabinet from one side only.

### Risk control (dealing with the problem)

*Suggested measures:*

- Put the most popular flavours close to the server;
- Angle the tubs to reduce wrist flexion;
- Store the ice cream at a slightly higher temperature so it is not as hard;
- Heat the scoop to make scooping easier; and
- Consider modifying the cabinet so that it opens on both sides.



## Case study 3

### Hazard identification (spotting the problem)

Workers at a plant nursery have recognised that they do considerable manual handling each day and are concerned that they are at risk of injury. Observation of their work reveals that there are periods of repetitive bending to pick up the many small pots on the ground. (The weight lifted in these instances is only a few kilograms). They also have to carry bags of fertilisers and other products weighing up to 25 kg, and drag trees in large bags and plants in heavy pots along the ground. Inspection shows that there are often spillages of soil etc. on the pathways, and that after the reticulation has been on, the pathways can be very wet.

### Risk assessment (understanding the problem)

*Main points:*

- *Frequent periods of repetitive bending to ground level;*
- *Manually lifting weights of up to 25 kg;*
- *Dragging very heavy weights; and*
- *Slippery pathways.*

### Risk control (dealing with the problem)

*Suggested measures:*

- *Purchase a pot lifter (see NOHSC website solutions);*
- *Purchase trolleys to transport bags of products and heavy pot plants;*
- *Use team lifting to get heavy trees or pots onto a trolley;*
- *Move very heavy items with mechanical lifting devices;*
- *Housekeeping measures to keep pathways clear; and*
- *Provide appropriate footwear.*



## Case study 4

### Hazard identification (spotting the problem)

An apprentice roof carpenter has sustained a back injury and has been off work. It has been noted that his job involves considerable manual handling of timber.

The timber used to build timber frame roofs is delivered in bundles and is offloaded by the delivery driver onto the verge. The apprentice roof carpenter then restacks the timbers so they are stacked in order of use. Having done this, he carries the timbers, in order of use, approximately 15 metres to the roof carpenter. The ground is often uneven and soft. The timbers are cut to length on a sawhorse and then the apprentice and/or the roof carpenter carry the timbers, approximately 20m, to the edge of the building ready for them to be lifted up. The weights of the timbers vary considerably but are often in excess of 55kg. The lengths of the timbers again vary considerably but can be in excess of 7 metres.

### Risk assessment (understanding the problem)

*Main points:*

- *Multiple handling in restacking timbers;*
- *Carrying timbers over a relatively long distance over poor terrain;*
- *Trip hazards from other construction materials lying around;*
- *Regularly carrying heavy, long timbers.*

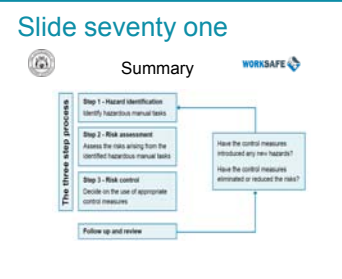
### Risk control (dealing with the problem)

*Suggested measures:*

- *At the design stage, review the length of timbers used;*
- *Get the supplier to package the timbers in reverse order so that they are stacked in the same order in which they are used;*
- *Get the delivery driver to unload the timbers as close as possible to the point of end use, that is near to the building being constructed;*
- *Change the work layout so as to minimise the distance the timbers have to be carried, that is, the sawhorse should be located next to the timber bundle, which should be delivered near to the building being constructed; and*
- *Use 2 people to carry long lengths.*



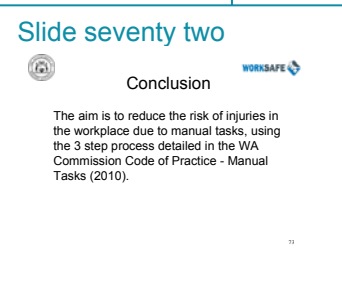
Summarise the 3 step process – spot the hazard, assess the risk, and making changes to reduce or eliminate the risk



### Background information

## Group Summary and conclusion

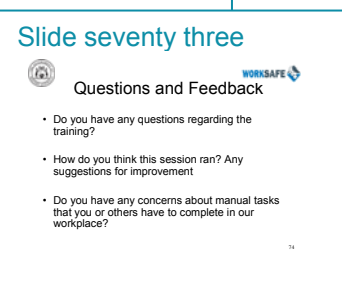
At the end of the workshop, summarise the main points of the 3 step process of identifying hazards (knowing what some of the risk factors are), assessing and controlling risks of manual handling in the workplace. The aim is to reduce the risk of injuries in the workplace using the process detailed in the Commission for Occupational Health *Code of practice: Manual tasks (2010)*



### Conclusion

*At the end of the workshop, summarise the aim: to reduce the risk of injuries in the workplace, using a risk management approach.*

Take the time to answer any further questions and seek feedback on how you can improve the training package to meet the needs of your workplace. It is recommended that you tailor this package to match your work.



References are available in the trainers pack

*With the question regarding concerns about manual tasks: Reinforce that this session is a chance to raise it now for discussion as a group and/or with management. Remind participants regarding the option of filling in a hazard report form if they have a concern, but do not feel confident with raising it during the training session.*

## Appendix 1 Workshop Plan

CONTENT	OUTCOMES	ACTIVITIES	DURATION	RESOURCES
<b>Introduction</b> 1. Purpose and learning outcomes of workshop. 2. Definition of manual tasks and hazardous manual tasks.	State workshop objectives Define manual tasks.	Lecture	10 minutes	Slides 1 to 9
<b>Legal setting</b> 1. Relevant legal requirements	Be aware of the OSH Act and state its relationship to the Code of practice & manual handling regulation.	Lecture	5 minutes.	Slide 10.
<b>Manual task injuries</b> 1. Types of injuries 2. How injuries occur 3. Cost of injuries	Understand more about manual task injuries and how they occur	Lecture	5 mins	Slides 11-13
<b>Anatomy/biomechanics</b> 1. Anatomy of spine. 2. Body positions & posture. 3. Types of muscle work. 4. Principles of biomechanics. 5. Relationship between the body and injury	State the basic principles of anatomy and biomechanics relevant to manual tasks and risk of injury from performing manual tasks..	Lecture  Questions	25 minutes.	Slides 14-26

*BREAK: 10 minutes*

PREVENTING INJURIES FROM **MANUAL TASKS IN THE WORKPLACE**

CONTENT	OUTCOMES	ACTIVITIES	DURATION	RESOURCES
<b>Manual task code &amp; the regulations</b>	Describe the steps in the code of practice & the relevant regulations.	Lecture	10 minutes	Slides 27-30
<b>Hazard identification</b>  1. Definition and purpose 2. The 4 stage process 3. The hazard identification form 4. Activity.	Describe the process of hazard identification.	Lecture  Activity	15 minutes  5 minutes	Slides 31-37  Slide 37  Hazard ID form for each participant
<b>Risk assessment</b>  1. Definition and purpose 2. The 3 stage process. 3. Risk Factors 4. Activity: The risk assessment form.	Describe the process of risk assessment.	Lecture  Activity	20 minutes.  15 minutes	Slides 38-55  Slides 50-55  Risk assessment form for each participant
<i>BREAK: 15 minutes</i>				

PREVENTING INJURIES FROM MANUAL TASKS IN THE WORKPLACE

CONTENT	OUTCOMES	ACTIVITIES	DURATION	RESOURCES
<p><b>Risk control</b></p> <ol style="list-style-type: none"> <li>1. Definition and purpose</li> <li>2. The process.</li> <li>3. Risk control strategies</li> <li>4. Activity</li> <li>5. Follow up</li> </ol>	Describe the process of risk control and follow up.	<p>Lecture</p> <p>Questions</p> <p>Lecture</p>	<p>20 minutes.</p> <p>10 minutes</p> <p>5 minutes</p>	<p>Slides 56-69</p> <p>Slide 70</p> <p>Slides 71- 72</p> <p>Risk control form for each participant</p>
<p><b>Who's responsible?</b></p> <p>Fill in forms and discuss answers.</p>	Identify who is responsible for each step of the process.	<p>Individual activity.</p> <p>Group feedback and discussion.</p>	10 minutes	<p>Slide 73</p> <p>'Who's responsible?' forms.</p>
<p><b>Conclusion</b></p> <p>Summarise main points. Take questions.</p>		<p>Lecture</p> <p>Questions</p>	<p>5 minutes.</p> <p>10 minutes</p>	<p>Slides 74-75</p> <p>Slide 76</p>

## Appendix 2

### Workshop Resources

**1. Who's Responsible?**

Print out enough forms for each participant.

**2. Case studies worksheets.**

Print out the case studies required, or print out scenarios specific to the participants' workplace. (One worksheet per participant).

### Manual Tasks – Who’s Responsible?

Read each statement and decide who is responsible for carrying that out. Tick the appropriate box or boxes. There may be more than one person responsible.

	<i>Employees</i>	<i>Safety &amp; Health Representatives</i>	<i>Safety &amp; Health Committee</i>	<i>Supervisor</i>	<i>Manager</i>
Informing manager/ supervisor of potential hazards and near misses.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reporting incidents and injuries.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Informing safety & health representatives of injury occurrence.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Informing safety & health committee of injury occurrence.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Keeping injury records.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analysing injury records.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inspecting manual tasks to identify & assess possible problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Liaising with workers on assessment issues.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ensuring appropriate control measures are implemented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Consulting with workers carrying out the manual handling tasks.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Evaluating the control measures implemented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attending training on the best way to manage manual tasks risks.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Provide supervision, instruction and training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Following instructions on safe working practices.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



## Case study 1

### **Hazard identification (spotting the problem)**

Pickers working in the warehouse have complained of sore lower backs and shoulders. On observation, their work involves taking order sheets clipped to a shopping trolley and walking around the racks, picking items to fill the order. They complain that they are often hindered by other pickers' trolleys and the forklifts which block the aisles while placing pallets on the upper racks.

The racks used by the pickers are 1.3 metres high. The heavier large items are just stored on pallets on the floor under the racks.

On completion of the order, the picker pushes the trolley to a work table, where items are unloaded, checked off and then stacked on a pallet on the ground. The products are then shrink-wrapped.

### **Risk assessment (understanding the problem)**

### **Risk control (dealing with the problem)**



## Case study 2

### Hazard identification (spotting the problem)

A worker in an ice-cream parlour has developed an aching forearm in her dominant arm. Most of her work involves serving ice-cream in cones to customers. On observation, she uses a metal scoop, reaches into the display cabinet to the chosen tub of ice-cream, pushes through the hard ice-cream to obtain the required size of scoop, then stands up and places the scoop onto the top of a cone held in the non-dominant hand.

Her other duties include refilling the display cabinet with 5kg tubs of ice-cream, and cleaning out the cabinet at the end of the day. The cabinet opens only from the server's side.

### Risk assessment (understanding the problem)

### Risk control (dealing with the problem)



## Case study 3

### Hazard identification (spotting the problem)

Workers at a plant nursery have recognised that they do considerable manual handling each day and are concerned that they are at risk of injury. Observation of their work reveals that there are periods of repetitive bending to pick up the many small pots on the ground. (The weight lifted in these instances is only a few kilograms). They also have to carry bags of fertilisers and other products weighing up to 25 kg, and drag trees in large bags and plants in heavy pots along the ground. Inspection shows that there are often spillages of soil etc. on the pathways, and that after the reticulation has been on, the pathways can be very wet.

### Risk assessment (understanding the problem)

### Risk control (dealing with the problem)



## Case study 4

### Hazard identification (spotting the problem)

An apprentice roof carpenter has sustained a back injury and has been off work. It has been noted that his job involves considerable manual handling of timber.

The timber used to build timber frame roofs is delivered in bundles and is offloaded by the delivery driver onto the verge. The apprentice roof carpenter then restacks the timbers so they are stacked in order of use. Having done this, he carries the timbers, in order of use, approximately 15 metres to the roof carpenter. The ground is often uneven and soft. The timbers are cut to length on a sawhorse and then the apprentice and/or the roof carpenter carry the timbers, approximately 20m, to the edge of the building ready for them to be lifted up. The weights of the timbers vary considerably but are often in excess of 55kg. The lengths of the timbers again vary considerably but can be in excess of 7 metres.

### Risk assessment (understanding the problem)

### Risk control (dealing with the problem)

## **Appendix 3**

### **Manual Tasks Risk Management Forms**

- 1. Hazard identification form;**
- 2. Risk assessment form;**
- 3. Risk control and follow-up form**

**Manual tasks: Hazard identification form**

Manual task no./name	How identified <small>Note the methods of identification include:</small> <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 <small>Note the risk factors of concern, such as:</small> <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:							

### Step 2 Manual tasks: Risk assessment form

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			

