

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

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

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

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

Location/group	Manual task (No.)		
Date of assessment:	Assessors/people involved:		
Risk factors to consider	Level of risk	Sources of risk	Comments
Refer to the information in Appendix 4 of this code of practice for guidance.	Estimate the level of risk each risk factor poses. ie: <ul style="list-style-type: none"> • n/a; • low; • medium; or • high. 	Note the possible source(s) of risk, ie: <ul style="list-style-type: none"> • work area/layout; • nature of the load; • nature of item, equipment, tool; • working environment; or • systems of work, work organisation or work practice. 	Make notes on reasons for your assessment.
Actions and postures			
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			
Forces and loads			
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			
Vibration			
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			
Working environment			
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			
Systems of work, work organisation and work practices			
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			
Worker characteristics Does the job:			
Involve young or older people			
Involve workers who are pregnant or who have recently given birth			
Involve workers with physical limitations or special needs			
Require special skills, capabilities or knowledge			
Require protective equipment or clothing that is limiting			
Involve workers with language or cultural barriers			

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

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

Appendix 4: Guidance material for rating risk factors

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

1. Actions and postures

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

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

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

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

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

1.1 Holding loads or arms away from the trunk

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

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

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

1.2 Reaching upwards and handling a load above shoulder height

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

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

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

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

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

1.4 Twisting the back or neck

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

1.5 Sideways bending or load handling on one side

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

1.6 Long carrying distances

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

1.7 Sudden jerky, rapid or unexpected movements

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

1.8 Bending hands or wrists forwards or to the side

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

1.9 Reaching behind

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

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

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

1.11 Twisting or wringing using fingers or hands

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

1.12 Maintaining the same posture for long periods

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

1.13 Repeating similar movements or actions

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

2. Forces and loads

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

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

2.1 Heavy

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

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

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

2.2 Bulky, large or awkward

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

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

2.3 Difficult or uncomfortable to grasp

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

2.4 Unstable, unbalanced or unpredictable

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

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

2.5 Harmful or fragile

The risk of injury increases when handling loads that are:

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

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

2.6 Handling a person or animal

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

2.7 Sudden jerky, rapid or unexpected forces

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

2.8 Strenuous lifting, lowering or carrying

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

2.9 Strenuous pushing and pulling

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

2.10 Sustained application of force or grip

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

3. Vibration

This section reviews exposure to vibration.

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

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

3.1 Whole-body vibration

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

3.2 Hand-arm vibration

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

4. The working environment

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

4.1 Constraints on posture or movement

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

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

4.2 Rough or slippery floors

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

4.3 Variations in levels or uneven ground

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

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

4.4 Adverse climatic conditions

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

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

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

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

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

4.5 Poor lighting

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

Lighting characteristics that should be considered include:

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

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

4.6 Narrow or obstructed thoroughfares

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

4.7 Poor ventilation

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

4.8 Distracting or loud noises

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

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

5. Systems of work, work organisation and work practices

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

5.1 Job demands and control

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

5.2 Task design

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

5.3 Work load

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

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

5.4 Task duration, frequency and variety

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

5.5 Pace of work and time constraints

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

5.6 Peak demand

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

5.7 Working hours

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

5.8 Support in the workplace

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

6. Worker characteristics

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

6.1 Young and older persons

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

6.2 Pregnant women or those who have recently given birth

The risk of injury increases as pregnancy progresses.

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

6.3 Special needs and physical limitations

The risk of injury increases with decreased physical ability.

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

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

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

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

6.4 Special skills, capabilities and knowledge

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

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

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

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

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

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

6.6 Language or cultural barriers

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

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