

Sprains and strains prevention



Think Safe - Work Smart

Queensland **the Smart State**



Queensland
Government
Department of
Industrial Relations



Introduction

Each year more than 85,000 workers are injured in Queensland costing Queensland billions of dollars in hidden costs.¹

This booklet aims to assist businesses prevent the most common form of injury in the Queensland workplace - sprains and strains.

Most of these types of injuries are caused by manual tasks such as lifting or carrying loads, working in fixed positions, repetitive tasks or using heavily vibrating tools.

Manual tasks can result in serious worker injury such as sprains and strains, and permanent spinal damage, and often can debilitate workers who may need to take leave from work for extended periods of time.

The second greatest cause of these injuries is slips, trips and falls at ground level and from heights such as jumping from vehicles, which can cause lower limb and back strains.

A workplace injury can be costly to your business. Think a moment about the workplace disruption that an injury may cause – it can have a direct result on productivity due to the need to re-fill the worker's job and retrain.

There is possible prosecution under the *Workplace Health and Safety Act 1995* or threat of being sued, loss of reputation, fines and increased workers compensation premiums.

It is an obligation under the Act and makes good business sense to provide a safe workplace.

Sprains and strains

Sprains and strains are damage to the soft tissue in the body, which often doesn't recover. It includes damage to muscles, ligaments, tendons, spinal discs, nerves, arteries and veins.

In Queensland, the common types of sprains and strains injury include:

- back injuries including pulled back muscles and ruptured discs
- squashed nerves causing severe pain (e.g. carpal tunnel syndrome in the wrist or sciatic leg pain from the back)
- ligament sprains in the upper body
- shoulder muscle sprains and dislocations
- abdominal hernias
- tendon injuries to the hands, forearms and elbows such as tennis elbow
- ankle sprains and strains.

How do these injuries occur?

Strains and sprains are a common workplace injury, which may occur as a result of a simple incident from over-exertion or a series of minor strains which build over time.

These injuries can occur from simple manual tasks such as:

- carrying, holding or restraining items, people or animals

¹ Queensland Workers' Compensation Scheme Statistics Reporting 2003-04 and The Costs of Workplace and Illness in Queensland – Workplace Health and Safety Queensland 2003-04.



- lifting, pushing, holding or pulling loads
- working in a fixed position with the back bent, sitting or standing continuously, or driving vehicles for long periods
- repetitive tasks such as reaching to lift or lower objects, or to grip tools continuously
- working in awkward positions involving bending or twisting your body to reach items
- using vibrating tools continuously.

These injuries are usually the result of common day-to-day tasks at work, meaning all workers regardless of occupation are at risk.

Industry related tasks causing sprains and strains injuries

Sprains and strains injuries account for approximately 50 to 60 per cent of injuries across the five priority industries targeted in the Queensland Workplace Health and Safety Strategy 2004–12.²

High-risk tasks resulting in sprains and strains injuries in these industries include:

Health and community services

- handling surgical loan sets
- raising patients from the floor
- handling patients
- pushing trolleys and wheeled equipment such as beds and carts
- handling laundry bags.

Construction

- labouring involved in concrete placement such as shovelling and spreading
- moving tools and materials onsite such as plaster board, electrical cable rolls and windows
- handling 40 kilogram cement bags
- falls from trucks, plant or equipment
- housekeeping and cleanliness on site.

Rural

- uncoupling equipment
- falling from tractors and machinery
- handling animals including drenching and dipping
- fencing activities such as hole digging and moving posts
- bending and awkward positions involved in vegetable picking.

Transport and storage

- stacking, unloading or making up pallets
- falls from trucks
- securing loads
- product packaging.

Manufacturing

- excessive hand tool use
- handling large, awkward sheet materials
- product packaging
- process line work activities
- contaminants on factory floors such as fats, water and dust which can result in slips, trips and falls.

² Queensland workplace health and safety strategy industry action plans

How to prevent sprains and strains injuries?

The simplest way of preventing sprains and strains injuries in your workplace is to develop a risk management plan which identifies, assesses, controls and evaluates safety hazards and risks.

1. Identify the problem

Firstly, be aware of the triggers in your workplace which may result in risk of injury.

These include changes in the workplace such as new equipment, procedures or schedules, and indications that something maybe wrong including workers reporting discomfort and highlighting better ways of performing manual tasks.

Make a list of problem manual tasks in your workplace and break down the manual tasks into actions for further assessment.

The risk management worksheets for manual tasks and slips, trips and falls at the back of this booklet are useful tools for recording and assessing these tasks.

2. Assess the risk

Be aware, there are four major risk factors (direct stressors) which contribute to sprains and strains injuries from manual tasks. These are:

Forceful exertions put high levels of stress on muscles and body tissues. An example is lifting a very heavy or awkward load from the ground (e.g. lifting a person or a 40 kilogram cement bag).

Awkward and static postures lead to workers having to use more muscular effort to do a job (e.g. awkward postures such as a bent back or raised arm, wrist and head) or keeping the body in the same position for extended periods of time (static postures such as the back bent while laying bricks).

Repetition and duration involves making the same type of movements over and over (e.g. frequent lifting or working on a production line) or holding a position for a long time increases the risk of injury.

Vibration through the whole body such as driving a truck which can damage the back or hand tool use which contribute to disorders of the wrist and arm.

Assessing the risk includes analysing the task to find out what risk factors are causing the problem.

Prepare

- look at the task during normal working conditions
- check out the work process, tools, equipment and workstation layout.

Consult

- talk to the workers doing the job and their supervisors
- ask if they have any clues to analyse the risk factors.

Risk assessment tools

- you can use the risk management tools at the back of this booklet to identify the major risk factors related to manual tasks or slips, trips and falls.
- these tools will help you prioritise the actions and tasks which are creating the highest risk to your workers.
- the tools will help you identify the degree of risk and suitable controls



3. Find the solutions

Look at the risk factors and decide measures which need to be put in place to control the risks and how quickly these measures need to be implemented based on your priorities.

There are two types of solutions to control risks:

- **Design controls:** these are the preferred controls because they are permanent, and can prevent the risk or reduce it substantially. They include:
 - > **job design** – making changes to the work station, tools or equipment, or the way a job is done
 - > **mechanical aids** – providing mechanical aids to reduce the effort to workers doing the job.
- **Administrative controls:** these mainly reduce the time that workers are exposed to the risk. For example:
 - > **work organisation** – rotate workers and avoid peaks in workflow
 - > **task-specific training** – ensure that workers are trained in their specific work, such as using tools and mechanical aids
 - > **maintenance programs** – regularly service and maintain tools and equipment
 - > **personal protective equipment (PPE)** – provide PPE such as safety gloves or glasses as needed.

Look at all the options available to you and choose the best. If you are having trouble identifying controls then read the green section of the manual task or slips, trips and falls risk management tool at the back of this booklet for some helpful ideas. Then document appropriate controls on the risk management worksheet.

4. Implement controls to minimise risk

Implement the controls by trialling control strategies before putting them into practice permanently.

Develop work procedures to formalise the controls, communicate with workers the reasons for the change, and provide training and supervision to help workers reach competence and compliance.

5. Review your controls

It is important to check whether the controls are in place and are being used correctly.

After a few months measure the effectiveness of the controls by consulting with your workers, observing work activities and undertaking walk through surveys.

Find out whether the controls implemented achieved the outcome of eliminating or minimising the risk, and ensure that the new controls have not introduced any new risk factors.

Other things to consider

Other issues that you need to address in your risk management plan include:

Design: when purchasing equipment it is necessary to ensure plant, tools, containers, work benches, furniture, mechanical devices and vehicles are safe.

Consultation: before changes are made to facilities or processes, or new equipment is purchased talk to workers in the work area.

Training: give practical training on the actual jobs done in your workplace and ensure workers know how to use the tools and equipment safely.

Keep records: record actions or tasks assessed through the manual tasks or slips, trips and falls risk management worksheets, specifications of plant and work processes, incident reports and actions undertaken, maintenance records of equipment and tools and records of training activities.



Manual tasks risk management tool

Instruction to use tools

On the manual tasks risk management worksheet, write down the problem manual task for assessment.

Assess the risks for this problem by using this appropriate risk management tool. The tool is based on a traffic light approach with guidance on what is high risk (red), moderate risk (yellow) and low or controlled risk (green).

The guidance in green also provides recommendations for controls. For a safe workplace you should answer YES to the key risk assessment question.

Identify the key risk factors involved in a specific task, if more than one risk factor is present during the task the risk of injury is increased.

Document the risks on your manual tasks or slips, trips and falls risk management worksheet.

Major risk factors (Direct stressors)	High risk Very likely to cause injury	Moderate risk Some risk of injury – Short-term controls	Low – Controlled risk Less likely to result in injury – Possible controls	Risk assessment questions
Forceful exertions				YES/NO
Large force is placed on the back or upper limbs when working in awkward postures.	<ul style="list-style-type: none"> - very heavy and awkward loads are lifted from ground (e.g. lifting a person or a 40kg cement bag) - manual handling large and heavy loads (e.g. heavy people) - wide loads are carried away from the body (e.g. glass or board sheeting) - heavy tools and equipment used for long periods (e.g. pick) - tool handles require a wide and forceful grip - unpredictable and/or unstable loads are handled (e.g. people, animals or coin bags) - carrying loads for long distances - workers not trained in safe manual handling methods of work - broken or worn equipment. 	<ul style="list-style-type: none"> - heavy items are lifted and carried at waist height - team lifting of heavy loads from the ground - heavy tools used intermittently - lifting and carry converted to pushing and pulling - pushing large, heavily loaded wheeled trolleys (e.g. meal trolleys) - workers trained in safe handling procedures only - hand holds provided on loads - handling large and heavy load with aids (e.g. slide sheets, skates or slip boards). 	<ul style="list-style-type: none"> - mechanical aids and assistive devices are used and maintained (e.g. cranes, hoists, trolleys, slings, hooks, roller systems, pallet jacks and forklifts) - tools and equipment are lightweight and ergonomic designed (e.g. handles are cylindrical, approx 4cm diameter and fit the palm) - heavy tools used frequently are suspended or counter balanced - indications of weight and safe handling procedures known or on loads - loads are of reduced size and weight (e.g. smaller packaging) - baffles, packing, dividers used to stabilize loads - no lift programs in place (i.e. mechanical and assistive devices - hoists and slide sheets) - materials placed close to where they are used - large wheels or tugs used with wheeled equipment. 	<p>Are there minimal forceful exertions?</p> <p>Are the forces applied to the body within the capacity of the workers?</p>
Awkward or static postures				YES/NO
Back bent, twisted or bent and twisted repetitively with force.	<ul style="list-style-type: none"> - working below or on the ground when lifting (e.g. manual loading, unloading pallets or steel fixing) - work items located to the side (e.g. side return on process line) - placing loads beyond comfortable reach. 	<ul style="list-style-type: none"> - working below thigh height - limited space to place feet when handling loads. 	<ul style="list-style-type: none"> - tools and work items placed in waist to shoulder range - scissor lifts and pallet lifters used - adequate knee and foot clearance - tilting work benches, spring loaded surfaces or rotating turntables - space for feet to turn when placing load at different angle - swivel chairs - extended handle tools used - adjustable height benches used. 	<p>Are workers able to operate in an upright, forward facing position?</p>
Neck bent forward, backwards, sideways or twisted repetitively. Neck held in these positions for long periods.	<ul style="list-style-type: none"> - visual inspection tasks on a moving process line for more than two hours - precision work done on a low bench - displays positioned to the side - information sources placed behind the worker. 	<ul style="list-style-type: none"> - reading material placed to the side on a desk - low work bench for seated work. 	<ul style="list-style-type: none"> - inclined work surface - displays, documents and information are front on to the worker in a comfortable viewing range - jigs used to orientate work item - information and displays positioned close enough to read comfortably. 	<p>Are workers necks comfortable when viewing things?</p>



Major risk factors (Direct stressors)	High risk Very likely to cause injury	Moderate risk Some risk of injury – Short-term controls	Low – Controlled risk Less likely to result in injury – Possible controls	Risk assessment questions
Awkward or static postures				YES/NO
Arms fully reaching forward, above shoulder or outwards. Arms held in these positions for long periods.	<ul style="list-style-type: none"> - limited access to loads handled (e.g. stock off palate in racking) - frequently used items placed outside comfortable reach (i.e. 30cm seated or 50cm standing) - heavy, forceful work done on a high bench (e.g. packing) - heavy, awkward items stored below hip and above shoulder range - supporting a load (e.g. holding a limb in surgery). 	<ul style="list-style-type: none"> - moderately used items placed outside comfortable reach (i.e. 30cm seated or 50cm standing) 	<ul style="list-style-type: none"> - comfortable working heights - items placed close to the body - arm supports for precision work or prolonged tool use - heavy and awkward items stored in hip to shoulder range - loads supported on frames, jigs and stands. 	Are workers arms close to the body?
Forearms rotated or wrists bent sideways repetitively.	<ul style="list-style-type: none"> - tool handles position wrist bent sideways as far as possible. 	<ul style="list-style-type: none"> - tool handles position wrists in uncomfortable bent positions. 	<ul style="list-style-type: none"> - ergonomic designed hand tools - use of jigs to orientate work - handles, levers and controls place the forearms in handshake position. 	Are wrists in a comfortable position? Are forearms in a handshake position?
Continuous kneeling or squatting.	Working on items at ground level (e.g. under cars).	<ul style="list-style-type: none"> - uses knee pads or cushion surfaces - varies posture regularly. 	<ul style="list-style-type: none"> - raised work surfaces (e.g. adjustable tables and hoists). 	Is there variety in the working postures?
Continuous sitting or standing for long periods.	<ul style="list-style-type: none"> - standing process work for more than two hours - office screen based work without variety. 	<ul style="list-style-type: none"> - standing process work for up to two hours. 	<ul style="list-style-type: none"> - sit stand chairs - job rotation and task variety - rail for foot rest to tilt hips and ease low back - tasks designed to do sitting and standing. 	Is there variety in the working postures?
Repetition and duration				YES/NO
Repetitive motions every 30 seconds for more than one hour or similar movements. Work is done for prolong periods.	<ul style="list-style-type: none"> - workers complete the same high-risk tasks continuously for long periods (e.g. hand tool use in furniture manufacture) - overtime and extended shifts worked doing heavy manual handling tasks or repetitive tasks - multiple double handling of loads (e.g. materials received and stored prior to use) - insufficient staff to carry out the work increasing exposure to other risks - speed of line is beyond workers capacity. 	<ul style="list-style-type: none"> - workers rotate to tasks of similar demands - limited rest breaks of short duration are provided. 	<ul style="list-style-type: none"> - change task order – alternate heavy and light, repetitive and non repetitive - task rotation to change workers doing task - job enlargement with greater variety of tasks with different demands - rest breaks are provided - work design to accommodate extended shifts with adequate rest breaks and tasks of lower demands - use of just in time systems - sufficient staff to do the work - peaks in workload are managed (e.g. extra workers) - work is self paced. 	Work is not repetitive or done for prolonged periods?
Vibration				YES/NO
Whole body vibration or hand/arm vibration exposure for significant part of shift.	Worker directly manipulating vibrating hand tools for prolonged periods (i.e. tools outside of 40 -300Hz range).		<p>Whole body vibration –</p> <ul style="list-style-type: none"> • seats of vehicles/plant mounted on suspension systems • work platforms suspended to isolate vibration • vehicles/plant, equipment/tool operated and maintained as per manufacturers instructions • time is limited operating vibrating sources (e.g. rest breaks or task rotation) <p>Hand arm vibration –</p> <ul style="list-style-type: none"> • tools fitted with speed adjustment, damping, isolation handles or auto shut off • equipment fitted with isolation mounts, air cushioned cylinders or air shut off clutches • handles fitted with insulation (e.g. rubber) • equipment and tools are maintained • uses anti-vibration gloves. 	The worker is protected from whole body and hand arm vibration?



Slips, trips and falls risk management tool

Instruction to use tools

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The guidance in green also provides recommendations for controls. For a safe workplace you should answer YES to the risk assessment question.

Identify the key risk factors involved in a specific task, if more than one risk factor is present during the task the risk of injury is increased.

Document the risks on your manual tasks or slips, trips and falls risk management worksheet.

Risk factors	High risk Very likely to cause injury	Moderate risk Some risk of injury – Short-term controls	Low – Controlled risk Less likely to result in injury – Possible controls	Risk assessment questions YES/NO
Floors: Fluids, contaminants and differing conditions.	<ul style="list-style-type: none"> - wet or oily hard and smooth floors - water tracked in from outside on rainy days - liquids pooling - oil, water and other fluid leaks from machinery, processes, stored containers - ice on cold room floors - moisture and fluids spills on external pathways - floors with uneven ridges, pot holes, worn surfaces - rushing, running and manual handling on floors with contaminants - floor coverings lifting (e.g. carpet ridges or tile edges). 	<ul style="list-style-type: none"> - inadequate drainage - condensation on cold room floors - moss and lichens on pathways - rough to smooth transition - use of caution wet floor signs - coatings and tapes partially worn away - minor changes in level - isolated low steps. 	<ul style="list-style-type: none"> - textured floors and slip resistant surfaces - floors treated with etchants - adequate drainage with graduated floors to drainage points - channels in floor for areas of substantial fluids - grates with non-slip profiles for wet work tasks - deep profile tiles to drain fluids - good design of cold rooms, machinery and processes to eliminate or minimise water leaks - absorbent flooring at entrances - umbrellas left at entrances in container - floors comply to Australian Standard AS3661.1 (1993) - welded joints in flooring. 	Are the floors non slippery and free from trip hazards?
Cleaning methods	<ul style="list-style-type: none"> - build up of floor polish on the floor - detergent residue on the floor. 	<ul style="list-style-type: none"> - workers walking on recently cleaned floor wet - poor cleaning methods. 	<ul style="list-style-type: none"> - signage to remove or caution workers during cleaning of floors - staff trained in cleaning procedures - suitable cleaning to remove residue - isolated area from pedestrians. 	Cleaning practices do not create slip risk?
Housekeeping and cleanliness: obstructions and contaminants.	<ul style="list-style-type: none"> - paper, dirt, rubbish, fluids and granular spills (e.g. distribution centres or truck containers) - aisles with obstructions - low obstacles over walkways (e.g. pallets, timbers or cords). 	<ul style="list-style-type: none"> - pedestrian walkways not well defined (e.g. storage areas). 	<ul style="list-style-type: none"> - procedure for immediate spill management and cleanup - clear and unobstructed aisles with trip hazards removed - regular cleaning system including high pressure for build ups (inside and outside pathways) - adequate storage - suitable cleaning methods for contaminants. 	Are walkways clean and free from obstruction?
Lighting	<ul style="list-style-type: none"> - limited vision on stairs, at floor transitions, on ramps and walkways - glare on walkways. 	<ul style="list-style-type: none"> - lower level or obstructed lighting and shadows where objects may be in walkways. 	<ul style="list-style-type: none"> - lighting as per AS1680.1 (1990) - clearly marked aisles - adequate lighting and visual cues on sudden transition areas. 	Is lighting designed in accordance to Australian Standards and safe movement requirements?
Stairs and ramps	<ul style="list-style-type: none"> - stairways not designed to Australian Standards - short foot space on fall - excessive variations in step dimensions - excessive radius on nosing - steep slope on ramp. 	<ul style="list-style-type: none"> - steep stairways (rise) - short treads (falls) - no or inadequate hand rails. 	<ul style="list-style-type: none"> - ramp surface non-slip - covers to eliminate weather conditions - 1:8 – 1:14 (disabled) ramp grades - non-slip stair tread and nosing - handrails 800-1000mm above nosing. 	Are stairs and ramps designed in accordance to Australian Standards and to job requirements?



Risk factors	High risk Very likely to cause injury	Moderate risk Some risk of injury – Short-term controls	Low – Controlled risk Less likely to result in injury – Possible controls	Risk assessment questions
Vehicle and plant access and egress	<ul style="list-style-type: none"> - jumping from vehicles or plant - step width minimal - shoes contaminated before climbing - broken or poorly maintained steps and hand holds - contaminants on the steps. 	<ul style="list-style-type: none"> - climbing into vehicle while carrying load - worker only climbs with two points of contact - worker rushing when climbing. 	<ul style="list-style-type: none"> - vehicles and plant have three points of contact for access - ergonomics design of access steps and hand holds - maintenance and cleaning of steps. 	Is the worker able to safely access and egress the vehicle or plant?
Tasks	<ul style="list-style-type: none"> - pressured work routines creating speed and sudden changes in direction of movement - limited vision for pushing and carrying loads (eg. tall trolleys) - unstable and unbalanced loads. 	<ul style="list-style-type: none"> - worker not aware of the slip and trip risks related to tasks. 	<ul style="list-style-type: none"> - slip resistant shoes worn - footwear for specific purpose (e.g. high water soles) - reduced pressure workloads - vision to the tasks always available - manual handling is minimised. 	Are the tasks that create slip and trip risks managed?
Footwear	<ul style="list-style-type: none"> - shoes not slip resistant - tread clogged with contaminants (e.g. mud, dirt or grease). 	<ul style="list-style-type: none"> - tread pattern worn - shoes not regularly cleaned. 	<ul style="list-style-type: none"> - footwear policy in place - shoes issued specific to purpose (e.g. gum boots). 	Is footwear suited to the purpose of the work? Is footwear maintained?
Other	<ul style="list-style-type: none"> - falling off animals due to sudden changes in direction and non securing - falling from moving vehicle (e.g. riding in ute trays or motor bike). 			Are other potential sources of slip, trip and fall risks managed?



Manual tasks risk management worksheet

Problem manual tasks

Task or activity:	Assessors name:
Location:	Position/Job title
Details:	Date:
	Workers consulted:

Identify the problems and assess the risk

When performing the task, what risks stress the body? (Check all elements of the task)

Step 1 – Are any of the major risk factors present (direct stressor)?

- Forceful exertions
- Repetitive movements
- Awkward and static postures
- Duration
- Vibration

Step 2 – What are causing these direct stressors?

(work area design and layout, nature of load, tool use, load handling, individual factors and work organisation)

Each ticked item is a risk factor which needs to be assessed to determine workers' exposure.

If more than one risk factor is present the risk of injury is increased.

* Refer to the manual tasks risk management tool for guidance on assessing risks (red and yellow).

Find the solutions

Decide on how to fix the problem

Step 1 – Redesign the task or activity to eliminate or minimise the risk.

* Refer to the manual tasks risk management tool for guidance on controlling risks (green).

Can you eliminate the risk?	▶	Yes – How? _____
▼ No		_____
Can you redesign the task or elements of the task? <ul style="list-style-type: none"> changing work area altering the size of loads using mechanical aids managing environmental conditions raising loads training workers. 	▶	Yes – How? _____
	▶	No
		Can administrative controls be used to minimise risk additionally? <ul style="list-style-type: none"> task rotation rest breaks preventative maintenance program (tools, trolley) training.
		How? _____

Step 2 – Implement controls

Person responsible for putting the controls in place? _____

By when _____

Review the controls

Evaluated by: / / Assessor: _____

- Consultation undertaken with all workers?
- Have the controls implemented reduced the risk?
- Have any other risks been created by the controls?
- Can further controls be implemented to minimise the risk?



Further information

For further guidance on risk assessment to prevent strains and sprains injuries see the *Manual Tasks Code of Practice 2000* available on the Department of Industrial Relations website.

For further general information on sprains and strains injuries please contact Workplace Health and Safety Queensland:

Telephone: 1300 369 915

Website: www.dir.qld.gov.au

Telephone interpreter service: 13 14 50

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