Slips, trips and falls prevention

A little slip at work can have a big impact on your life.

A publication of Workplace Health and Safety Queensland

"I was drilling on the factory floor. I tripped on the extension cord and did my back in. I'll be out of action for weeks. Not just at work, but at home too."

Introduction

Each year more than 13,000 Queensland workers suffer an injury as a result of a slip, trip or fall costing Queensland businesses more than 256,000 lost work days and over $60 million in workers' compensation payments.[1]

In addition to workers' compensation costs, there are financial, physical and emotional costs for the injured worker and their family. A workplace injury often affects injured workers' well being by restricting their usual home and leisure activities.

Simple and cost effective measures can reduce the number and severity of these injuries. This booklet aims to provide you with a basic understanding of what causes a slip or trip and provide you with some ideas on what you can do to stop these incidents occurring.

Slips, trips and falls

Slips, trips and falls can happen in any workplace. They can occur at the entry of a building, in the kitchen, in cold rooms, on loading docks and even as you walk outside the building.

More serious slips or trips together with the resulting falls may result in:

- sprains or strains
- broken bones when trying to break the fall
- a back injury due to the sudden and forceful impact during a fall
- burns if it occurs near hot surfaces or if the person is handling hot fluids
- cuts if it occurs near sharp objects.

Causes of slip, trips and falls

There are various factors that contribute to the risk of slips and trips. Slips usually occur when there is a loss of grip between the shoe and the floor. This commonly occurs when there is a contaminant between the shoe and the floor. Trips occur when a person's foot hits a low obstacle in the person's path, causing a loss of balance. Often, the obstacle is not easily visible or noticed.

The following factors can contribute to the risk of slips and trips. It is usually a combination of these factors that create the risk of a slip or trip.

Contaminants

Contaminants can be considered as anything that ends up on a floor. Contaminants can be wet such as water, oil or grease, or dry such as dust, metal shavings, plastic bags or off-cuts. Preventing floor contaminants is one of the best things you can do to prevent slips.

Floor surfaces

Floor surfaces require sufficient grip to prevent slipping, especially in areas which may become wet or contaminated. The greater the thickness or viscosity of the contaminants, the greater the slip resistance of the flooring required to protect against slipping.

1 Associated payments include compensation payments ($38.3M), goods and services payments ($18.4M) and non-compensation payments ($4.3M). Source: Queensland Employee Injury Database as at August 2007, Workplace Health and Safety Queensland.

Cleaning

Cleaning affects every workplace and everyone in the workplace. Besides regular cleaning programs, everyone has a role keeping the work area clear and taking responsibility for their own spills.

Floors need to be cleaned properly to ensure that:
- contaminants are effectively removed
- a build up of cleaning product residue is avoided
- the floor does not become too slippery
- floors maintain slip resistant properties (of non-slip flooring).

Prompt attention to spills is also important in order to prevent slips.

Obstacles and other trip hazards

Trips most often occur because of uneven flooring or cluttered walkways with low obstacles which are not easily visible or noticed. Common examples of low obstacles include trailing cables, uneven edges to flooring, gratings or covers, loose mats or carpet tiles and changes of floor surface level.

Trips can be prevented by:
- good housekeeping practices
- ensuring the floor surface is in good order such as being free from holes, uneven surfaces, curled up linoleum or carpet edges
- avoiding any changes in floor surface level, or if this is not possible, highlighting these changes
- providing adequate storage facilities.

Environment, including lighting

Poor lighting and distractions such as unfamiliar or unexpected loud noises, or extreme environmental conditions, such as extreme cold or heat, can impact a person noticing slip or trip hazards in their path. Adequate light levels without glare or shadowing is required to highlight potential slip or trip hazards. Other distractions, like those mentioned, should be minimised as much as possible.

People and activity

Work activities, the way the work is organised and attitudes to safety can affect the worker's ability to see or think about where they are going. For example, people hurrying, carrying large objects, pushing high trolleys or talking on a mobile phone could contribute to the cause of a slip or trip.

Workers need to be able to maintain their balance when performing tasks and be able to recover if they slip or trip. For example, when handling loads, workers should have full view of where they need to travel and should also have a free hand to hold onto a rail when walking down steps.

Consideration should be given to:
- individuals physical attributes such as vision, balance and agility
- the work being carried out and how it is organised
- who will be walking through the area, including the public.

Footwear

Footwear plays an important role in reducing the risk of slips, trips and falls. Footwear should be:

- suitable for the type of work and work environment
- comfortable with an adequate non-slip sole and appropriate tread pattern
- checked regularly to ensure treads are not worn away or clogged with contaminants.

Leads here, there and everywhere – Case Study

A worker carrying a box tripped and fell over an electrical lead that ran across the walkway in a manufacturing workshop. During the fall he hit his head and shoulder on the corner of a piece of equipment. He sustained a serious shoulder injury which required major surgery. The company was prosecuted and received a fine of $25,000. The injured worker was off work for three months and could not be replaced for this period due to a skilled labour shortage.

An inspection of the work area showed that:

- electrical leads for equipment used near the walkway often ran across the walkway
- lighting in the workshop was poor so he could not clearly see the electrical lead
- workers often carried bulky items along the walkway, which obstructed their view of the floor.

This incident could have been prevented by:

- positioning power outlets nearer to the point of use, to eliminate leads trailing across the walkway
- providing adequate lighting in the workshop for safe movement and to highlight obstructions on the floor reducing the size of the load being carried or providing mechanical aids, such as trolleys so that bulky items can be moved around the workshop without obstructing the workers vision.

Slippery kitchen floor – Case Study

Towards the end of a shift in a commercial kitchen, a worker slipped and fell sustaining serious burns after coming in contact with a tub of hot water. The tub of water was used for cleaning the floor at the end of the night. It was positioned beside the walkway near the deep fryer where in the same area several floor tiles were missing. This hollowed area allowed pooling of water and oil which was tracked throughout the kitchen. The kitchen floor was properly cleaned once at the end of the night. Workers were advised to wear enclosed shoes, however no advice was provided regarding the type of non-slip sole that should be worn.

The workplace was prosecuted and received a fine of $17,500. The injured worker was off work for two months and the workplace had to recruit and train a new employee to fill in for this period.

This incident could have been prevented by:

- replacing the missing tiles to stop contaminants pooling on the floor
- installing splash guards on the deep fryer to prevent oil splashing onto the floor
- placing covers over the deep fryer when it was not in use to prevent workers coming into contact with the hot oil
- putting in place spills management procedures so that spills are immediately attended to
- increasing the frequency of cleaning to minimise contaminants on the floor
- implementing a suitable footwear policy so that all workers wear shoes that have a non-slip sole.

How to manage slips, trips and falls risks

The simplest way of preventing slips, trips and falls injuries in your workplace is to develop a risk management plan which identifies, assesses, controls and monitors safety hazards and risks. The following information, together with the slips, trips and falls risk management tool and worksheet at the back of this booklet, will help you develop a risk management plan and record your assessments.

Identify hazards

Identifying hazards is the first step to determine exactly where slips, trips and falls can or have occurred in your workplace. You can find out this information by talking to workers and supervisors, inspecting the premises, and reviewing records such as incident and injury reports as well as workers' compensation claims.

Another useful method is to sketch a layout of the work area and mark on it where slip and trip incidents or hazards have been reported.

Assess the risk

The next step is to assess the slip or trip risks. Usually it is a combination of factors that create the risk. Consider the risk assessment questions in the right hand column of the risk management tool to assist in determining the level of risk. The red and amber section of the risk management tool can be helpful to determine the level of risk.

As part of your assessment you should also consider:

- how many people are exposed
- the consequences of the slip or trip – a slip or trip with or without a fall can be more serious if it occurs near hot, sharp or moving objects, or at a height, such as near stairs
- how often the situation occurs.

Fix the problem

Look at the assessed risks and decide what needs to be done to eliminate or reduce the risks and how quickly these measures need to be implemented. There are six types of control strategies to eliminate or reduce the risks and they are listed below in order of their effectiveness.

Hierarchy of controls	***Examples***
Eliminate the hazard	Remove slip and trip hazards at the design stage such as eliminating changes in floor levels; installing more power outlets through the floor and ceiling to avoid trailing cords.
Substitution	Resurface floors.
Isolation	Limit access to high risk areas.
Minimise risk by redesign (engineering means)	Apply floor treatments to increase slip resistance; improve lighting; stop leaks from equipment or pipes; provide adequate drainage to prevent pooling of contaminants; clearly mark edges of steps and any changes in floor height.
Administrative controls	Implement good housekeeping practices such as clear access ways; prompt spills management; use of signage or barricades for wet or slippery areas; training and supervision.
Personal protective equipment	Wear suitable footwear.

Look at all the options available to you and select controls that will best reduce the risks. Commonly, a range of controls may be needed.

If you are having trouble deciding what suitable controls are then read the green section of the slips, trips and falls risk management tool at the back of this booklet for some helpful ideas. Then write down these controls on the risk management worksheet.

If possible, trial the preferred control options before putting them into practice permanently.

Develop work procedures to formalise the controls, communicate with workers the reason for the change, and provide training and supervision for all staff.

Monitor and review controls

It is important to check whether the controls in place are effective, being used correctly, and have not introduced new hazards or risks. This can be done by talking with your workers, observing work activities, undertaking walk through surveys and reviewing incident and hazard reports.

Other things to consider

Other issues that you need to address in your risk management plan include design, maintenance, consultation, training and record keeping.

Design

Prevention of slips, trips and falls starts with good design of the workplace. When fitting out new premises/extensions or refurbishing the workplace, incorporate features to prevent slips and trips. This is detailed in the green section of the risk management tool.

When commissioning or purchasing new equipment, as well as ensuring that it is safe, ensure it provides adequate containment of any possible by-product such as off-cuts, grease, and dust.

Maintenance

This is fundamental to ensure that control measures remain effective. For slips and trips prevention:

- maintain the condition of floor and ground surfaces, stairs and ramps
- maintain machinery to prevent leaks
- ensure there is adequate lighting
- ensure workers wear suitable footwear to provide adequate grip.

Consultation

Before changes are made to facilities and processes, or equipment is purchased, talk to workers in the work area about the changes.

Training

All staff should have good understanding of slips, trips and falls hazards and how they can play their part in preventing them. For example, train staff in the risks and control strategies that have been implemented, including relevant procedures for cleaning and hazard reporting.

Record keeping

Record all areas assessed and actions taken through the slips, trips and falls risk management worksheet, specifications of plant and work processes, incident reports and actions undertaken, maintenance records of equipment and tools, and records of training activities.

Slips, Trips and Falls Risk Management Tool

Instructions

- Write down the identified work area or activity on the following slips, trips and falls management worksheet.
- The following information is based on a traffic light approach with guidance on what is high risk (red), moderate risk (amber) and low or controlled risk (green). This can help assess the risks for specific situations. The guidance in green also provides ideas for controls.
- For a safe workplace you should answer YES to the risk assessment questions listed in the far right column. Identify the key risk factors involved. Commonly a number of risk factors are present. Write down the risks on the following worksheet.
- Further information can be sought from other publications such as Australian Standards and the Building Code of Australia.

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
Internal floor surface and condition	- Slip resistance of flooring too low or patchy for expected use, and type and amount of contaminants. - Aged flooring with reduced slip resistance. - Uneven floor surfaces (e.g. worn floor coverings, broken tiles, missing or damaged grates or covers). - Poorly maintained access ways (e.g. loose carpet tiles). - Uneven floor heights (e.g. height difference between loading dock and floor of truck, gap between loading dock and truck). - Unmarked edges (e.g. end of loading dock). - Slippery metal surfaces (e.g. loading dock plates, walkways, grates or covers).	- Sudden changes in floor surfaces (e.g. from tiles to carpet). - Coating and tapes partially worn away. - Minor changes in level. - Isolated low step.	- Textured floors and slip-resistant surfaces are appropriate for the work performed. - Existing floors treated to improve slip resistance (e.g. acid etching, sandblasting, grinding and grooving). - Flooring is level and unbroken. - Welded joins in flooring. - Minimum sudden changes in floor surface texture. - Changes in floor level highlighted with high visibility edging.	- Does the floor surface have enough slip resistance to protect against slipping with expected contaminants? - Are tripping hazards eliminated?
External ground surface and condition, including workplace access and egress	- Uneven ground surfaces or pathways (e.g. uneven or loose paving; footpaths and garden edging poorly maintained; pot holes; cracked and uneven concrete or bitumen; missing or damaged grates or covers). - Surfaces that are slippery when wet (e.g. tiles, smooth concrete, grates or covers). - Slippery surfaces (e.g. metal grates or covers).	- Minor changes in level. - Tree roots encroaching on path. - Muddy areas. - Wet grass.	- Clear and level path. - Access ways that are slip resistant in the wet or sheltered from rain. - Ground surfaces and pathways maintained in good condition. - Grates or covers are in good condition with non-slip surfaces. - Short cuts across grassed or muddy areas discouraged.	- Are paths for access and egress to the workplace clear, slip resistant in bad weather and without trip hazards?

Contaminants	- Inadequately drained floor surfaces in wet areas (e.g. toilet/bathrooms, kitchens, food preparation area). - Areas that may have fluid or other contaminants on the floor (e.g. food preparation areas, particularly around sinks, deep fryers, urns; supermarket delicatessens; wherever food and drink consumed). - Areas where leaks are common (e.g. oil stains in undercover concrete car-park). - Oil, water and other fluid leaks from machinery, work processes or stored containers. - Ice on cold room floors. - Dry contaminants (e.g. powders, granules, swarf) allowed to build up on floor. - Dry litter (e.g. cardboard, plastic wrapping) left on the floor. - Wet surfaces near external doors where traffic and weather brings in rain water. - Moisture and fluids spills on external pathways.	- Condensation on cold room floors. - Machinery not regularly maintained for leaks. - Growth over outside pathways (e.g. moss and lichens). - Leaf litter.	- Adequate drainage with graduated floor to drainage points. - Deep profile tiles to drain fluids. - Ensure efficient drainage of outdoor ground surfaces. - Good design of cold rooms, machinery and processes to eliminate or minimise leak or spread of contaminants. - Slip-resistant and absorbent flooring or door mats at entrances should be secured or large enough to remain in place. - Cover at building entry to reduce rainwater entering. - Umbrellas left at entrances in containers. - Proactive maintenance programs to detect and repair signs of leaks. - Keep outdoor surfaces free of leaves, mud, clippings, paper and gravel and remove moss or slime with a chlorine-based solution.	- Are water and other contaminants well contained to minimise its spread onto floors or paths?
Cleaning procedures	- Contaminants still present after cleaning. - Wet cleaning or polishing of floors during working hours. - Build up of floor polish on the floor. - Detergent residue on the floor.	- Workers walking on recently cleaned but wet floor.	- Isolated cleaning area from pedestrians (e.g. cleaning of floor surfaces outside working hours or exclude pedestrians from area till floors are dry). - Suitable cleaning to remove residue. - Staff trained in cleaning procedures. - Signage to remove or caution workers during cleaning of floors. - Cleaning program in place to prevent build up of cleaning product or residue.	- Is the cleaning practice effective in removing contaminants and does not create a slip risk? - Can cleaning be undertaken with no or minimal pedestrian traffic in the area? - Is it dry before pedestrians can walk on it?
Cleanliness	- Untidy work areas (tools on floor, waste or materials accumulating on floor; storeroom with raw materials, rubbish, waste overflowing). - Accidental spills left unattended.	- Debris, old leaves on pathways.	- Hazardous warning signs and procedure for immediate spills management and clean up. - Provide enough waste bins and locate them close to work area.	- Are clean up procedures effective in promptly managing spills and keeping floors and paths clear from waste material?
Housekeeping/ obstacles	- Storage of equipment and goods in aisles and walkways. - Low obstacles where people need to walk (trailing extension cords; empty pallets; bolts or other items protruding from floor).	- Pedestrian walkways not well defined (e.g. open areas used for work processes and pedestrian access). - Unsuitable matting such as flattened cardboard boxes.	- Clear and unobstructed aisles and walkways with trip hazards removed. - Highlight fixed obstacles (e.g. marked in bright yellow). - Adequate storage areas for goods, trolleys and equipment. - Power outlets positioned to avoid running cords across the floor.	- Are the walkways through the workplace and the floors near where people work kept clear and tidy?

Environment / lighting	- Limited vision on stairs, at changes of floor surfaces or floor levels, on ramps and walkways. - Glare on walkways. - Poorly lit work areas and walk ways. - Sudden changes in lighting levels between areas (e.g. between outdoors and a dimly lit stairwell, or between outdoors and loading bay; distracting shadows on steps, stairs and walking surfaces).	- Low level or obstructed lighting and shadows around hazards (e.g. objects in walkways, uneven flooring). - Increased risk when working in cold or heat (e.g. cold rooms or freezers, humid conditions such as smoke house).	- Adequate lighting for the work area and work tasks. - Clearly marked aisles. - Appropriate lighting and visual cues on hazard areas such as changes in floor surface level. - Adequate lighting for access ways including night time use. - Provide graduated lighting between areas. - Replace, repair or clean lights before levels become too low for safe work.	- Is the lighting adequate to clearly see the path of travel and slip and trip hazards? - Are distractions in the area minimised?
Stairs and ramps	- Inappropriately designed steps and stairs (eg stairs with inadequate foot space; variable step heights in staircase; steps with excessive radius on nosing). - Ramps that are too steep or with slippery surface. - Small or missing landings where doors open directly onto stairs. - Step edge and tread not obvious.	- No or inadequate hand rails. - Poor condition of steps and stairs. - Isolated low steps particularly at doorways and cold room entrances. - Speed humps that encroach on pedestrian walkways. - Only use steep stairways for secondary access, and ensure they have sturdy handrails on both sides.	- Ramps and stairs designed to relevant standards. - Ramp surface made slip resistant with foot grips or textured surface. - Sturdy handrails or guard rails on all platforms, steps or stairs. - Non-slip stair tread. - Clearly marked and non-slip step edges. - Adequate rails on ramp to prevent trolleys running off the edge. - Eliminate isolated low steps if practice. - Ensure isolated low steps are highlighted. - Non-slip treads. - Highlight the start and finish of ramps. - Covers to eliminate weather conditions.	- Are the stairs and ramps appropriately designed and maintained in good condition?
Activities (tasks)	- Heavy trolleys used on steep ramps. - Trolleys used on ramps without edge protection. - Rushing, running and performing manual tasks on floors with contaminates. - Pressured work schedules creating speed and sudden changes in direction of movement. - Limited vision for pushing and carrying loads (e.g. tall trolley or large loads).	- Carrying a load that prevents workers from gripping a handrail or breaking a fall. - Handling unstable and unbalanced loads.	- Good vision of path of travel. - Use lifts where possible. - Minimise carrying loads on stairs. - Use suitable trolleys on stairs or provide ramps. - Suitable footwear is worn. - Work is organised so that the need to rush or run is avoided.	- Do the work tasks allow the person to adequately maintain their balance and enable them to save themselves from a slip or trip? - Do tasks allow workers to have an adequate vision of their path?
Footwear	- Unsuitable footwear worn for the task. - Shoes are not slip resistant.	- Tread pattern worn. - Tread clogged with contaminants (e.g. mud, dirt or grease).	- Suitable footwear policy in place (for selection and usage). - Wearing of suitable footwear is monitored.	- Is footwear suited to the purpose of the work? - Is footwear maintained? - Can it provide good grip on the floor during work duties?
Other				- Are other potential sources of slip, trip and fall risks managed?

Slips, Trips and Falls Risk Management Worksheet

Problem area or activity

Work Area: _____ Assessed by: _____

Activity: _____ Position/Job Title: _____

Details: _____ Date: _____

_____ Workers consulted: _____

Identify the problems and assess the risk

What are the risks? Refer to slips, trips and falls risk management tool for guidance on assessing risks (red and amber columns).

- ☐ Floors (internal or external)
- ☐ Cleaning procedures
- ☐ Stairs and ramp
- ☐ Footwear
- ☐ Contaminants and obstacles
- ☐ Activity
- ☐ Environment/lighting
- ☐ Other

Find the solution

Step 1 - Decide on how to fix the problem

** Refer to the slips, trips and falls risk management tool for guidance on controlling risks (green column).*

Can you eliminate the risks?

▶ Yes - How? _____

No ▼

Can you redesign the environment, activity, work process or equipment?

For example:

- Apply floor treatments to increase slip resistance.
- Improve lighting.
- Stop leaks from equipment or pipes.
- Provide adequate drainage to prevent pooling of contaminants.
- Clearly mark edges of steps and changes in floor height.

▶ Yes - How? _____

▶ No

Can administrative controls also be used to minimise risks?

For example:

- Implement spillage management procedures.
- Implement suitable footwear policy.
- Carry out cleaning out of operational hours.
- Provide training on slips, trips and falls.

How? _____

Step 2 - Implement controls

** Refer to the slips, trips and falls risk management tool for guidance on controlling risks (green column).*

Person responsible for putting the controls in place: _____

By when: _____

Review the controls

Reviewed by: / / Date of review : / /

- ☐ Have workers been consulted?
- ☐ 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?

"I was carrying a full tray down the stairs. I guess I should have used the lift, but it was really busy and I needed to save time. I slipped and injured my shoulder. It doesn't hurt that much, but not playing with Sally does."

Further information

For further general information on preventing slips, trips and falls, please contact Workplace Health and Safety Queensland:

Telephone 1300 369 915

Website: www.deir.qld.gov.au

Telephone interpreter service: 13 14 50

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