An employer's guide to the *Manual Tasks Code of Practice 2010*

What are manual tasks?

Manual tasks are part of nearly all work done by workers. They include any activity where workers grasp, manipulate, carry, move (lift, lower, push, pull), hold or restrain a load.

Manual tasks and injury

Manual tasks can contribute to injuries affecting all parts of the body, particularly the back, shoulder and wrist. These tasks account for half or more of the:

- cost of workers' compensation claims
- number of days lost from work
- absences over six months.

How do manual tasks contribute to injury?

Injuries are commonly linked with ongoing wear and tear to the joints, ligaments, muscles and intervertebral discs. They can be, but are rarely caused by, a one-off overload situation.

How do injuries happen?

Over a period of time, damage can gradually build up through:

- handling of loads — frequent lifting with the back bent or twisted, or pushing/pulling loads
- working in a fixed position with the back bent, continuous sitting or standing, or driving vehicles for long periods
- repetitive work with the hand or arm, and having to grip tools or loads tightly
- working with the neck, shoulders and arms in a fixed position (e.g. using tools and handling heavy loads), and
- using vibrating tools.

Workplace responsibilities

Employers have a legal obligation under the *Workplace Health and Safety Act 1995* to provide a healthy and safe workplace for themselves, their workers and anyone else in the workplace.

To prevent or minimise exposure to the risk of injury you must:

- **Manage** the risk.
- **Design/purchase** work processes or equipment which do not cause adverse health effects.
- **Consult** with workers about their work.
- **Train** workers so they can do their work safely.

Manual tasks must also be considered in preparing workplace health and safety plans and inductions.

How do I manage the risks from manual tasks?

The risk management process means:

1. Finding out the tasks that can cause problems.
2. Looking at the tasks to see if there are any parts of them that need fixing.
3. Working out how the problem can be fixed by:
    - choosing solutions
    - putting them in place
    - following up to see that they are working.

Finding the problem

Not all tasks are harmful, but you should look out for those that could be.

There are three times when problems can be triggered:

1. When making a change, analyse the effects on workers when:

- buying new equipment or tools
- starting or changing a work process
- changing work schedules (longer days etc).

2. When there are indications something may be wrong:

- look further when workers let you know the job could be done in a better way, or is causing them discomfort, and
- observe how work is being done.

3. After an incident has happened:

- investigate accident reports immediately, and
- if you have had a number of incident reports or workers' compensation claims over a time, look for trends in them.

Assess the problem

This part of the risk management process means carefully analysing a task to find out what the risk factors causing the problem are.

Prepare
Get ready to assess the task:
- Look at the task during normal working conditions.
- Check out the work process, tools, equipment, and the workstation layout etc.

Consult
- Talk to the workers doing the job, and the supervisor or mechanics.
- Ask if they have any clues about what could be wrong.

Checklists
- Use checklists to analyse risk factors.

Decide
- Look at the risk factors and decide which need to have solutions found for them.

Finding solutions that work

There are two types of solutions to control risks:
1. Design controls are best because they are permanent, and can prevent the risk, or reduce it to its smallest amount. Controls include:
- **Job design —** these make changes in the workstation, tools or equipment, or the way a job is done.
- **Mechanical aids —** providing mechanical aids to reduce the effort of workers in doing the job.

2. Administrative controls work mostly by reducing the time workers are exposed to a risk factor. For example:
- **Work organisation —** rotate workers, avoid peaks in workflow.
- **Task-specific training —** see that workers are trained in their specific work (using tools or mechanical aids).
- **Maintenance programs —** service and maintain tools on a regular basis.
- **Personal protective equipment** (PPE) **—** provide PPE such as knee pads or gloves where needed.

The last steps in the risk management process are to:
- **Select the solutions —** look at all the options and choose the best.
- **Put solutions into place —** test the solutions first to see they will work.
- **Review solutions —** after about two months check out the solutions to see they are:
  - working successfully
  - being used correctly
  - have not introduced new risk factors.

What else is important for risk management?

Other aspects which should be part of your overall risk management plan include:

Design

You must make sure the following are designed/purchased to be safe and without risk to health and safety:

- work processes involving manual tasks
- work items including plant, tools, containers, workbenches, furniture, mechanical devices and vehicles.

Consultation

- Talk to workers about their jobs. They know most about them.
- Include workers and supervisors in all parts of the risk management process.

Training

- Give practical training on the actual jobs done in your workplace.
- Make sure workers know how to use the tools and equipment safely that are part of their job.

Keeping records

Keep records (in a central place) of:

- specifications of plant and work processes
- incident reports and action taken
- maintenance records for the service of equipment and tools
- training activities.

What are risk factors?

"Risk factors" are part of the demands of a job. They affect the worker and can contribute to injury. They include:

1. Forceful exertions
2. Working postures
3. Repetition and duration
4. Vibration
5. Work area design
6. Use of tools
7. Nature of loads
8. Load handling
9. Individual factors
10. Work organisation.

Risk factors fall into three categories:

1. **Risk factors (1-4)** contribute directly to injury, e.g. a worker does a job in a particular working posture, exerts force, repeats a movement over and over, or absorbs vibration from tools or equipment.

2. **Risk factors (5-8)** are the risk factors that contribute directly to injury, e.g. workstation design (**5**), using tools (**6**), the nature of loads handled (**7**), and load handling (**8**), cause the worker to be in a certain posture or repeating a movement.

It is these risk factors which need to be redesigned, so that **permanent** change can be made.

3. **Risk factors (9-10)** modify the other risk factors. For example:
   - Individual factors mean that the impact of a job may be worse for a particular worker because of a previous injury.
   - Work organisation can lessen the effect of other risk factors by rotating workers.

No risk factor occurs alone. There is a cross-over between the different categories.

Following is a summary of the risk factors and how they contribute to injury:

1. Forceful exertions

Forceful exertions place high loads on muscles and other tissues and therefore contribute to injury.

The level of muscular effort needed to do a job is affected by factors such as:

- the working posture
- handling loads which are heavy, bulky or difficult to grip
- making fast movements
- working with a grip that does not allow a large area of the hand to contact the handle
- using vibrating tools which need more effort in gripping.

2. Working postures

- **Awkward** postures lead to workers having to use more muscular effort to do a job. This means working with joints away from their straight position (e.g. bent back, head, wrist or arms raised). Awkward postures are not always harmful. It is only when they are repeated frequently or for a long period.
- **Fixed positions** can also be harmful by keeping part of the body in the same position for a long time (e.g. the back bent while laying bricks). Fixed positions make the muscles fatigue more quickly than when movement is produced. This is because blood flow is more restricted when the muscle is not contracting and relaxing.

3. Repetition and duration

- Making the same type of movements over and over (e.g. frequent lifting, working on a production line), or holding a position for a long time, increases the risk of injury. It is worse when repetition and duration are combined with forceful muscular effort. The effects of fatigue can damage muscles and other tissues.

4. Vibration

- Vibration through the whole body (e.g. driving a truck) can damage the back. Vibration through the hand/arm contributes to disorders of the wrist and hand.

5. Work area design

- The work area is where a particular job is based and includes:
  - work benches, conveyors, furniture and equipment used by workers doing the job.

Continually reaching or bending for items needed, or having the work surface too high or too low causes more muscular effort and earlier fatigue.

6. Use of tools

- Poor design and excessive use of hand tools contribute to disorders of the wrist, elbow and shoulder. Harmful aspects of tools are their weight, how hard they are to grip, and how much the wrist has to bend to hold them.

7. Nature of loads

- The way loads are packaged can make them more difficult to handle (e.g. the weight and bulk of loads, whether there are handles, and how stable or predictable they are).

8. Load handling

- Lifting and carrying loads are the biggest cause of back problems. They also add to shoulder problems supporting heavy loads. Pushing or pulling can also cause muscle overload and lower back problems.

9. Individual factors

- Problems can occur if a worker is not matched to the job (e.g. skill or fitness level), or does not have the right protective equipment to do the job (e.g. gloves or knee pads).

10. Work organisation

- Workers sometimes have to work too fast or for too long when meeting deadlines, or when working on fast paced production lines. Lack of maintenance on equipment can make work harder to do. Inadequate rest breaks can result in fatigue with inflammation of tissues and damage to muscles and joints.

Risk factors — Checklists and control options

How to use
If you answer YES to any of the questions below, look for a control option in the second column under the same number.

Checklist questions	Control options
Working posture 1. Is forceful, repetitive work done with the **back** bent forwards, twisted, or twisted and bent?	Back — avoid **bending**: • position tools and other work items so workers do not need to bend forward • use a scissor lift table or a pallet lifter • design suitable work heights and provide adequate knee and foot clearance • tilt some work surfaces, parts bins and spring-loaded surfaces etc. Avoid **twisting** the back: • have enough room to turn the feet when placing a load at a different angle • have swivel chairs • use rotating turntables.
2. Is the **neck** repeatedly or for long periods bent forwards, backwards, sideways or twisted?	Neck — avoid **bending**: • use an inclined work surface • work with documents/displays front on to the worker • use a jig to reorient the work piece.
3. Is prolonged or repetitive work performed with **arms** stretched forwards, above shoulder height, or outwards?	Arms: • modify equipment or provide a platform to have worker at the right height to avoid lifting the arms • use arm supports for precision work or if working with tools during sustained reaching.
4. Is work done repeatedly with the **forearm** twisting, or the **wrist** bending sideways?	Elbow and wrist: • select tools to reduce the forearm turning • use jigs to save turning components (e.g. treaded fittings) • use tools/levers that allow the wrist to remain straight • use a jig to position parts.
5. Is work done with sustained **squatting** or **kneeling**?	Legs and knees: • reduce need for kneeling and provide a cushioned surface • avoid squatting by having only necessary work done at low levels.

6. Are workers required to **sit** or **stand** continuously for more than 2 hours?	Sitting or standing: • reduce standing time with a sit-stand chair, and/or having a rail at the base of work benches relieve prolonged sitting by designing the job so worker can get up and walk around occasionally.
Repetition and duration 7. Does the work involve repetitive motions or many similar movements?	Vary the work: • change task order — alternate heavy handling with lighter tasks, or repetitive with non-repetitive work • job rotation — change workers doing a job • job enlargement — give each worker more jobs to do through the day.
8. Are tasks in a job rotation program similar to one another?	Plan rotation activities so that the same body parts are not used repetitively all the time.
9. Are rest breaks not provided?	Plan work so that micro breaks can be taken when needed or organised breaks are available in paced jobs.
10. Is regular overtime worked in tasks requiring heavy manual handling or repetitive work involving the upper limbs?	Extended hours — see that the work is suitable for shifts longer than 8 hours, otherwise, redesign the work.
Vibration 11. Is the worker exposed to whole body vibration for significant portions of the work shift?	Whole body vibration: • improve vehicle suspension and install operator seats mounted on suspension systems • isolate or damp vibrating work platforms through appropriate suspensions • operate equipment at suggested speed • limit time spent, and provide breaks away from vibrating sources.
12. Is vibration from tools/equipment transmitted to the operator's hand?	Localised vibration (hand/arm): • avoid tools with vibration in the range of 200 - 300 Hz for tasks performed repeatedly • choose tools that have speed adjustment, internal damping, vibration-isolated handles, or automatic shut off • use air-cushioned cylinders, air shutoff clutches, or properly selected isolation mounts • cover handles with vibration-insulation rubber • maintain equipment on a regular basis.

Work area design 13. Are workers not able to operate in an upright, forward facing position with upper arms close to the trunk?	Location of work components, displays or controls: • provide all materials, tools, controls and maintenance items in front of the worker and between waist and shoulder height • design supply and disposal areas so operators do not twist to get supplies or dispose of units • place frequently used displays and controls directly in front of the worker • operate controls at around elbow height without bending or twisting the body.
14. Do working heights or reaches cause workers to bend or reach beyond a comfortable range?	Working heights and reaches: • Working **height** should be at about elbow height, higher for precision work, and lower when force is needed. • Frequent **reaches** should be no more than **30** cm to the front of the body in a seated position and **50** cm in a standing position.
15. Is there insufficient space for working movements and materials (e.g. limited knee and foot room)?	Make sure workstations are adjustable where possible to suit all size workers, otherwise design: • **height** to suit tall workers and raise shorter workers by providing moveable platforms or benches • **reaching** distances for shorter workers, and the largest workers will also be able to reach comfortably • **knee and leg clearance** under work surfaces so larger workers can move the body easily.
16. Is the seat poorly designed or poorly adjusted, or is a back rest with lumbar support, armrest or footrest required?	Seating should be adjustable with a swivel base, and have: • a contoured backrest with a lumbar curve except where the back rest would interfere with work • arm rests where hand activity is not continuous • a foot rest where the feet do not reach the floor.
Use of hand tools 17. Are heavy tools or equipment used repetitively or for a prolonged period?	If tools are heavy and being used repetitively, consider: • suspending — for operations repeated in the same place • counter balancing — especially if tools have to be held away from the body.

18. Does the design of the tool handle require the wrist to be bent during use or a forceful or wide grip?	Tool handle design: • have the wrist in the shake-hands position • be cylindrical (about 4 cm in diameter) • have a comfortable gripping surface (e.g. dimpled) • without sharp edges or areas that dig into the fingers or palm of the hand • have a handle span between 6-9 cm.
19. Do the tool handle dimensions not fit the hand well?	Tool handle dimensions: • grip length should be about **10** cm for precision tools and **12** cm for power tools • cut-out handles should be about **12** cm long by **6** cm wide.
Nature of loads 20. Are there problems handling a load due to its size or shape?	Try to make loads as light or small as possible by: • repackaging (e.g. putting in smaller containers, or specifying smaller or more manageable loads when purchasing) • reducing the number of objects handled at one time.
21. Could the handles on containers be better sized or shaped for the weight and size of the load?	Get handles put on boxes or containers when loads are heavy, moved frequently or are hard to grasp. Handles should be at the top of the load, and sized to suit the hand: • about **11** cm wide by **5** cm, and larger if gloves are used • cylindrical handles about **4** cm in diameter.
22. Are there problems handling a load due to its condition? (e.g. is the load hard to grip, fragile, unbalanced, non rigid, or slippery)?	Where handles or handholds can not be provided: • look at providing hooks, suction pads or other gripping devices • have an easily gripped surface (e.g. by waxing). Surfaces should not be slippery. To avoid sudden movement of a load: • anchor items so they will not move • use slings or other aids to maintain control during handling where the load lacks rigidity • use baffles, dividers or packing to keep the contents stable in partly filled packages.

Load handling 23. Is forceful handling, such as lifting, lowering or carrying, done frequently or for long periods?	Manual lifting or carrying heavy loads should only be done as a **last resort**. Use **mechanical aids** that suit the load and the work being done, and are as light and easy to use as possible. **Redesign** the task: • by modifying the load weight, size and shape (see item 20 above) • reduce the amount of loading/unloading by using mobile racks for pallets, containers or trays • keep heavy work items at working height • convert from carrying to pushing, pulling, sliding or rolling suitable loads.
24. Are mechanical aids not available which could make work easier?	Locate aids close to the work area, and have them in good working order.
25. Are loads carried over long distances or stored so workers have to bend or reach high?	Have goods delivered close to where they are needed and arrange work area layout to reduce carry distances. Where possible store loads between thigh and shoulder level. Place only light items above or below this level.
26. Are loads pushed/pulled repetitively?	Reduce pushing or pulling: • use non-powered conveyors, air bearings, ball castor tables, monorails • use trolleys with large wheels or castors that roll freely, and with handles at about 1 m.
Individual factors 27. Does the worker lack sufficient experience, or not been trained to do the task or use the equipment safely?	See that: • a worker's skill matches the job, especially for heavy or fast work • training is given, and is updated when the job changes (e.g. when there are new tools, equipment or working method).
28. Are there special factors that might affect how easily the worker can do the job (e.g. age, injury history)?	See that the work is suitable for the worker: • avoid allocating young (under 18 years) or older workers to physically demanding or fast work • assess jobs for workers with a previous back injury • take pregnant workers off physically demanding tasks such as lifting or carrying loads in the last three months of pregnancy.
29. Is the worker new to the work or returning from a period of rehabilitation or an absence from work?	Give the worker time to work up to full speed. Provide for adjustment through: • reduced line or machine speeds • reduced workloads or more frequent breaks job rotation.

30. Does the worker's clothing or PPE interfere with task performance?	To increase work efficiency and reduce effort: • see that workers do not wear clothes that restrict movement • see that gloves are the right size and cover only the part of the hand that needs protection (vibration) • provide knee protectors for work involving kneeling.
Work organisation 31. Is there insufficient staff to meet deadlines or cope with peaks in demand?	Control peaks in workload: • In slacker periods, prepare work for those times when deadlines become urgent. • Rearrange materials flow round the worksite to smooth supply and reduce double handling.
32. Is the work pace controlled by a machine or process?	Self-paced work is better for physically demanding tasks: • provide adequate supplies of materials so workers do not have to leave their work area • provide buffers on assembly lines so material can be taken off-line (e.g. "holding" bins or benches) • reduce the speed for abnormal conditions, such as poor quality raw materials or new products.
33. Has maintenance on tools and equipment not been done or fallen behind schedule?	Set up procedures for the routine maintenance/ servicing of power tools and equipment. List which items need servicing and specify for each who should do it, the type of service, and how often.