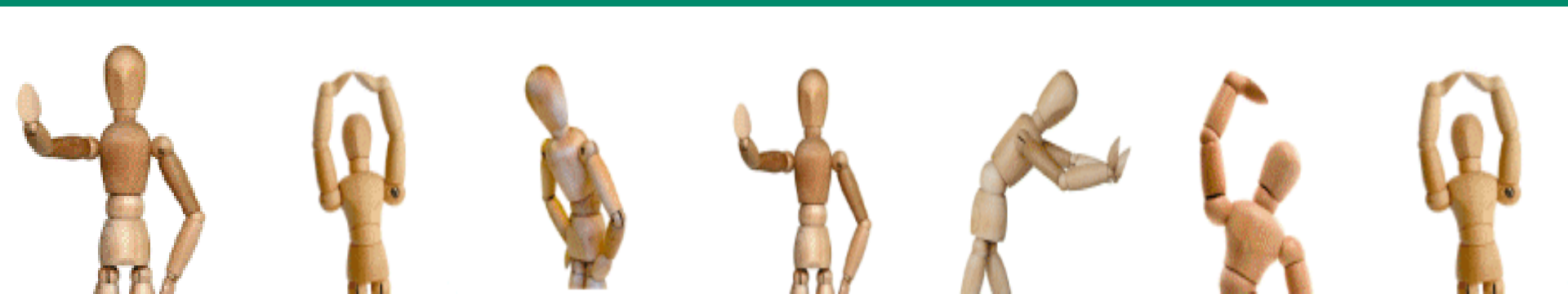


Assessing and managing musculoskeletal risks in the extractives industries

Marion Edwin, CNZHFE
Ergonomist
Optimise Ltd, Motueka
marion@optimiseltd.co.nz
www.optimiseltd.co.nz





Marion...



- Background - occupational therapist turned ergonomist
- Certified New Zealand Ergonomist (CNZHFE), owner/operator of Optimise Ltd, ergonomics consulting
- Sawmilling and forestry, manufacturing, farming, corporate, retail, hospitality, meat/dairy, and most recently the commercial fishing industry – research/consulting
- Confession... (But only one of my colleagues said they had done work in – quarrying, RTW post injury)
- But I have done a lot of work addressing musculoskeletal risks with NZ industries...

Ergonomics/human factors

- The scientific discipline... understanding the interactions among people and the other elements of a work system... to optimise human well-being, safety and overall system performance (Horberry et al 2011)
- Human-centred design optimising the fit between the things we do, the things we use, and the environments we work in
- Ergonomics = Human Factors

People knowledge

- Designing work systems based on understanding people - capabilities, limitations, motivations, behaviours, preferences...
- Anatomy, physiology, biomechanics, anthropometry, neuroscience, social psychology, cognitive science, organisational psychology, management, work study, epidemiology, public health, sociology

Ergonomics/human factors goals

- Design-based discipline - often work with product design, engineering, architecture, computer science... using our 'people knowledge' to influence the design of systems, equipment and environments
- Aims:
 - 1 Improve work performance
 - 2 Improve safety, health and wellbeing of workforce and wider community



'Concentric Rings' - Model of ergonomics factors relevant to work design.
(Adapted from Grey et al., 1987, as in Wilson and Corlett, 1995)

Ergonomics/human factors professionals

- The Human Factors and Ergonomics Society of New Zealand is our representative body, and if you are seeking an ergonomist you can look for Certified or Associate level professionals
- Others may have some experience or knowledge of some aspects of the field

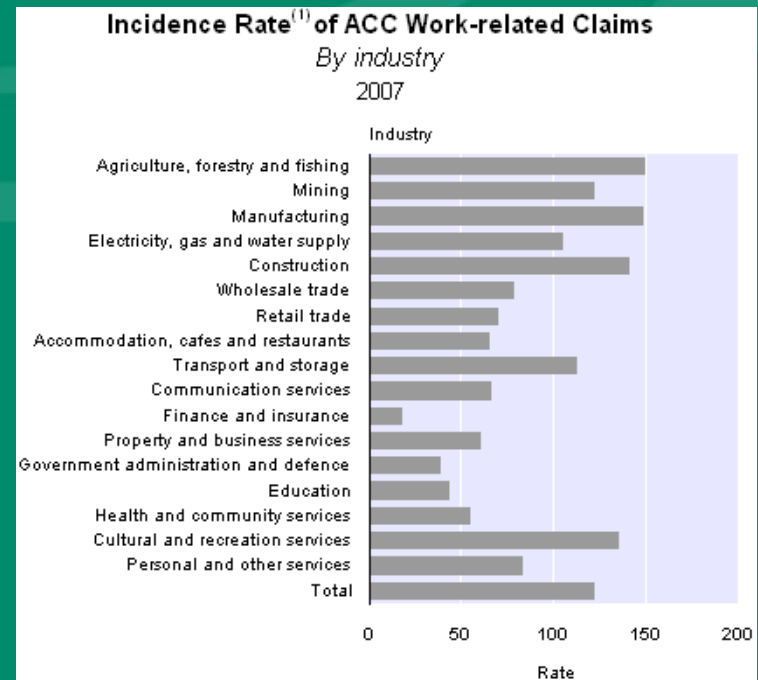
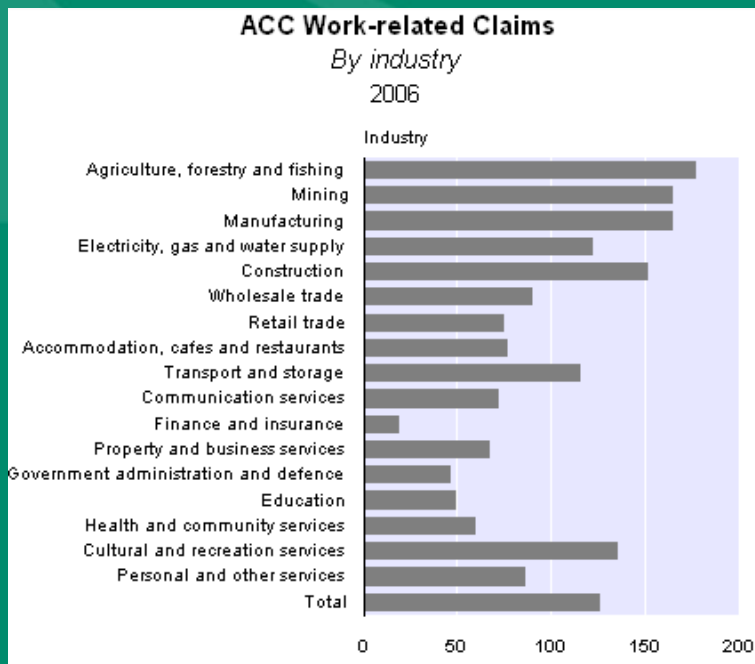


Extractives Industry H and S

- Traditionally about controlling higher impact, low frequency injuries - death, serious harm/serious ill health
- New legislation demands improved hazard identification and risk management generally – for safety and health
- Musculoskeletal disorders may be less catastrophic, but have significant long-term impacts, and often reduce worker capacities
- As an example, commercial fishing recognised that half of their incidents were ‘strain/sprain’ in origin, and have commenced work targeting this

How prevalent is MSD in the NZ extractives industries?

- Hard to tell easily... Mining 165 claims per 1000 FTE 2006 (2nd highest by industry), but less in 2007... (Statistics NZ)
- Strains and sprains = 42%/43% of all claims (2006/2007)



Musculoskeletal disorders (MSD)

- Occupational overuse conditions (RSI, WRULD, Cumulative TS, OOS, Carpal TS, med/lat epicondylitis, de Quervain's tenosynovitis... etc...)
- Back injuries
- Strains and sprains
- Vibration-related conditions (HAV, WBV)
- (Discomfort, 'sore bits', 'just me lumbago')
- Related to manual handling
- Enter ACC's 2006 'Preventing and Managing Discomfort, Pain and Injury Programme' (DPI)

Based on scientific evidence - 2006 'DPI Programme'

2006-2011, 3 hour session, learning objectives included:

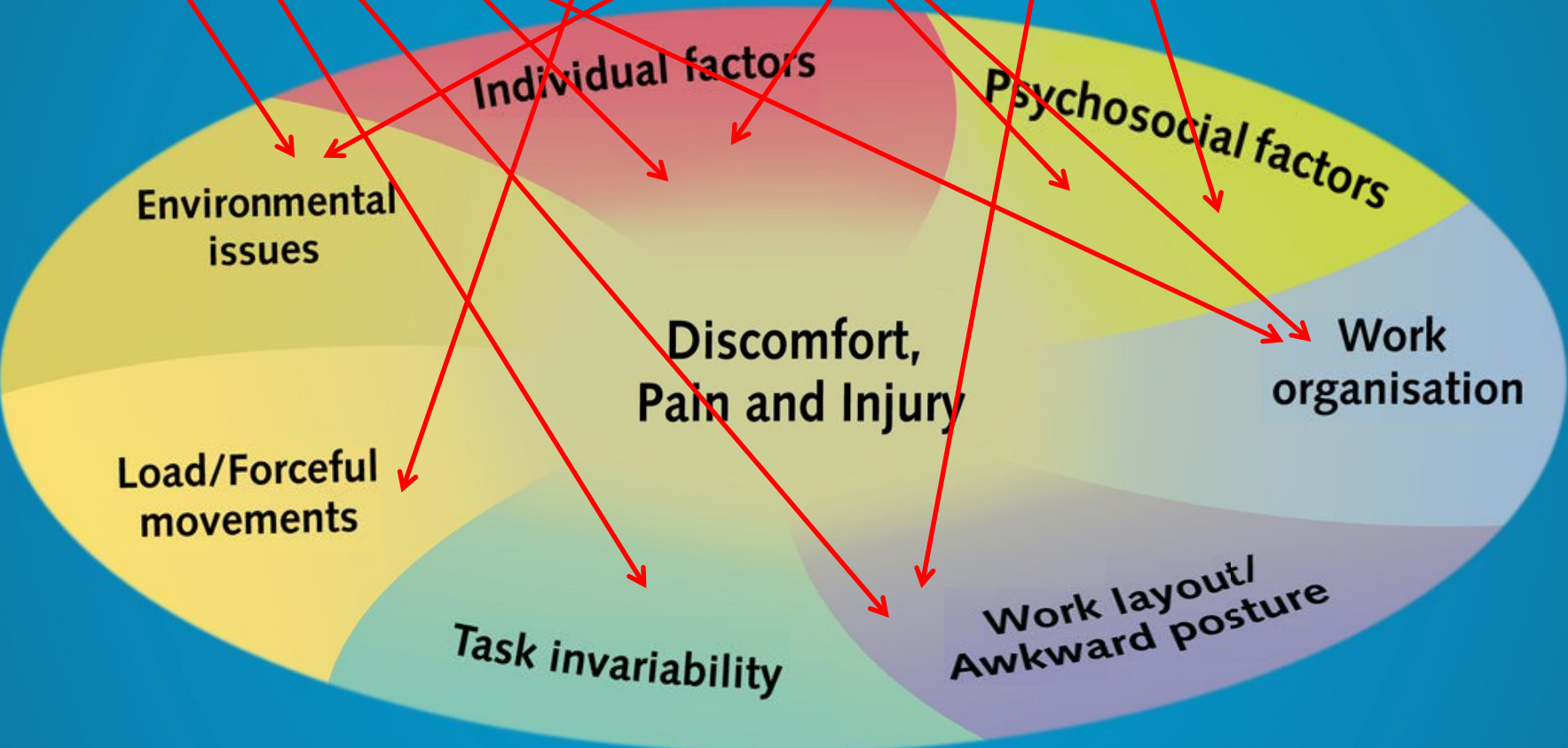
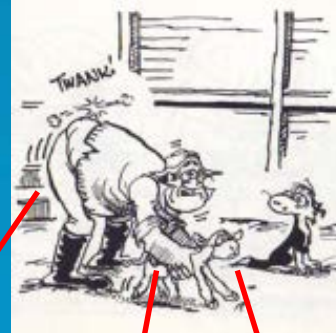
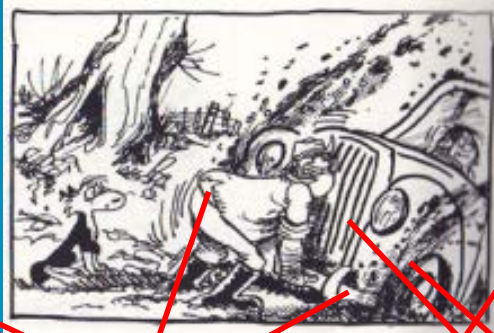
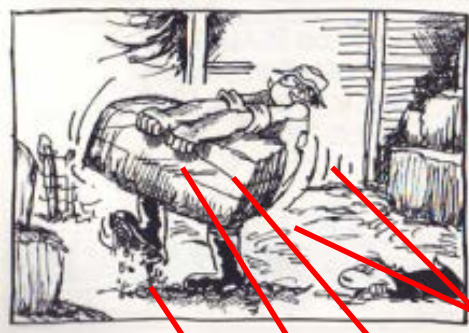
- Knowledge of seven groups of Contributory Factors for DPI (an ergonomics/human factors approach)
- Understanding how the contributory factors interact
- Management strategies must address all groups of contributory factors
- The range of tools and resources available to help implement DPI approach

The Seven Groups of Contributory Factors









Resources

- Early reporting forms – employee/employer
- Information on 'stay at work' and 'early return to work' programmes
- HabitAtWork web resource – education
- WorkSmart Tips resource – industry specific guidance
- Risk Reckoner for manual handling risk assessment
- Cost benefit analysis tool on ACC website
- Systems and Practices checklist



HabitAtWork

HabitAtWork is an educational tool promoting self-help and problem solving for preventing and managing discomfort, pain and injury.
Learn more and assess yourself by choosing your work environment.

Office 2.0  Industrial 

Select your work environment

This website requires **Flash Player 7** or later, which you can download from www.adobe.com.
Alternatively you can download [text versions here](#).
→ [Download HabitAtWork or Assessment Module](#)
→ [Disclaimer and Copyright](#) → [Order HabitAtWork and Intranet Resource Pack on CD](#)

✕ Exit to ACC website



Office 2.0

SELECT THIS WORK ENVIRONMENT

Industrial

WORK ENVIRONMENT SELECTED

Use this tool to prevent and manage discomfort, pain and injury in the industrial environment.

KEYWORD SEARCH



Learning: Myths and realities

[DPI](#) | [DPI Quiz](#) | [Resources](#) | [FAQs](#)

Learning: Work in comfort

[Contributing factors](#) | [Positions and postures](#) | [Setting up your work area](#)

Assess yourself

Self-help: Get rid of pain

[Click here if you experience discomfort or pain](#)



Manager's toolkit

[Prevent](#) | [Early report](#) | [Stay at work](#) | [Return to work](#) | [Barriers and Myths](#)



Exercise of the Day

[replay](#)

[Click here to view more exercises.](#)

[Contact us](#)

[Exit to ACC website](#)

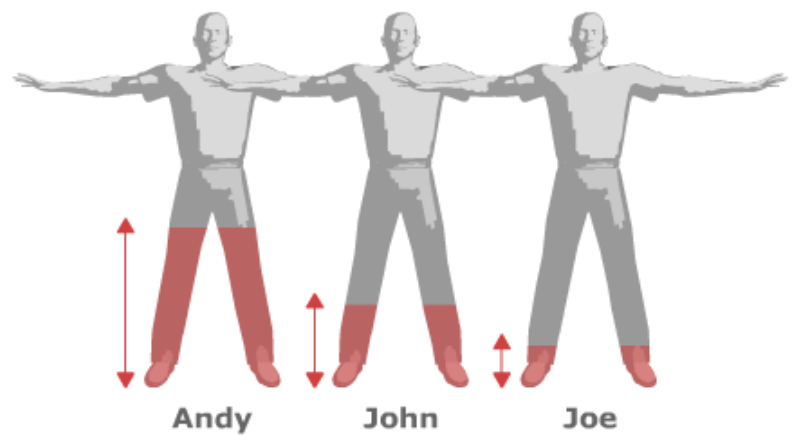




The combination effect(2)

Each person's container has a different capacity due to individual factors that can't be changed such as age, gender, and genetic makeup. In the pictures below, this is shown by a base block in the container which changes its total capacity.

The larger the base block the less room there is for contributory factors to fill up the container. This difference in overall capacity explains why in apparently identical situations, some people will get discomfort, pain and injury and others won't.



The size of the base block, which represents a number of individual factors, differs from one individual to another.

KEYWORD SEARCH



Myths and realities

Work in comfort

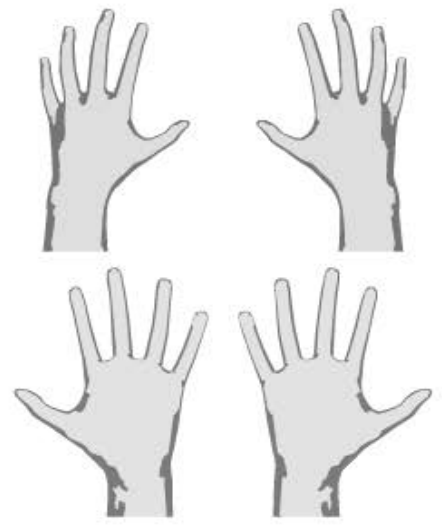
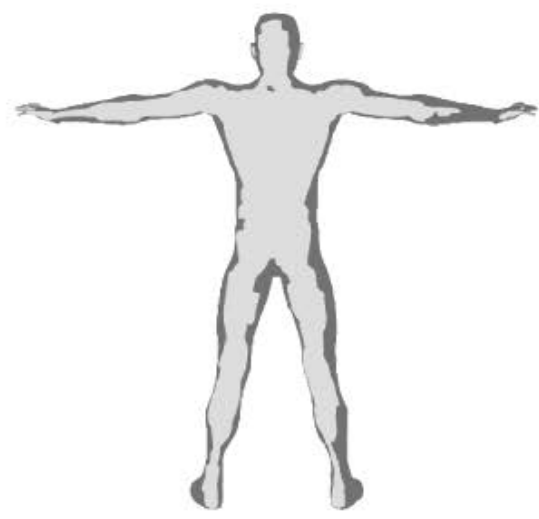
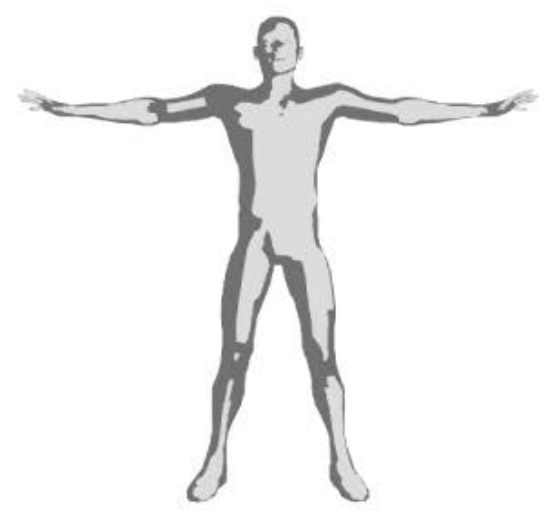
Assess yourself



Self-Help and Problem Solving - use this any time you experience discomfort or pain

Get rid of pain

Select an area where you have discomfort or pain:



[Fill out an early report form](#)

Print this page

Contact us

Home

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Next



Welcome to Work Smart Tips

About Work Smart Tips

Create free Health & Safety tips sheets for your workplace



ABC Tiling
Peter Smith

The resource contains important information for your workplace. Keep the information handy.

ACC PROCESSES:
The Accident Compensation Corporation (ACC) provides comprehensive, no-fault personal injury cover for all New Zealand residents and visitors to New Zealand.
This means you can apply for ACC's help, no matter how you get injured, or where built in New Zealand.
ACC's help can include a wide range of services - from government research treatment, to help around the home while you get better, and assistance with your income if you can't work because of your injury.

EAT WELL
Healthy foods provide energy to function and nutrients to help you stay well.
- Eat the servings of fruit and vegetables per day.
- Eat good fats in foods like nuts, seeds, avocados, vegetable oil, salmon. Reduce bad fats by eating lean meat, reduced fat dairy products, and lower fat foods and oils.
- Replace sweet snacks with fresh fruit, low sugar moulded bars and nuts, or a smoothie.
- Try having less salt with your food.
- Drink at least 1.5-2 litres of water per day.
- Take lunch breaks away from your work area. Your digestion works best when you are relaxed.

COPE EFFECTIVELY WITH STRESS
Find positive ways to deal with stress at work and home.
- Face up to the big issues, e.g. family relationships, financial and health. Get professional help/counselling if you need it.
- Stay positive. Managing a stressful situation will get easier you feel good.
- If your work is stressful, tell your boss. Healthy food, plenty of sleep and exercise are also healthy and reduce your ability to cope with stress.
- Allow yourself time to relax and recover from stress. Schedule fun time!

HAZARD INFORMATION
Walls, masonry, PPE and machinery guards, always check etc.

HYDRATION
- Dehydration can make you fatigued, affect your judgement, cause cramps, heat stress or heatstroke. Even low levels of dehydration can cause problems.
- The amount of water you require will vary depending on the work undertaken, individual characteristics, temperature etc. But if you are doing strenuous work, you should have at least 2litres (around 3 glasses) per hour.
- Even without strenuous work, a person requires around 1.5 to 2 litres of water per day.
- Coffee/alcohol/drugs do not count as water replacement. In fact, these drinks can make you lose water.

ABC TILING

BACK EXTENSION
- Stand with feet hip-width apart, leaning on a stable surface.
- Curve backwards to stretch back into extension.

BACK OF FOREARM STRETCH
- Place shoulders, elbow bent, behind with palm facing down.
- Hold hand and gently tugdown elbow, stretching fingers back and down.

FRONT THIGH STRETCH
- Using support, stand on one leg.
- Keep knees safe by side, bring feet towards your backfoot.
- Try to keep your back straight.

HIP STRETCH
- Stand flat on one leg.
- Pull opposite knee up towards chest keeping an upright position.

FIRST AID PART A
USE R.U.E.S. (RUEE FIVE DAYS)
RUEE: To find further damage, avoid moving the injured part as much as possible.
RUEE: Put ice in a baggie (soak and place on the injured part for 20 minutes, every two hours for the first 48 hours).
COMPRESSION: Bandage between two treatments.
ELEVATION: Keep the injured area raised as much as possible.
WOUNDING: If the pain or swelling hasn't gone down significantly after 48 hours, seek professional medical help.

FIRST AID PART B
AVOID R.U.E.S. (RUEE FIVE DAYS)
RUEE: Avoid hot baths and showers, saunas, hot water bottles, heat packs and treaments.
RUEE: Medical assistance (swelling and cooling) at the injury site and direct heating.
WARNING: This should not override the injured part for 72 hours unless approved by a medical professional.
WOUNDING: Managing an injury in the first 72 hours can slow down recovery.



Get going quickly with our ready made Work Smart Tips sheets.

Or create a customised Work Smart Tips sheet with your own selection of tips and stretches.

[Get started here >](#)

Welcome to

Work Smart Tips

About Work Smart Tips



Choose your workplace

Select a workplace below which best describes the environment you work in.



Cab operators



Construction



Farm work



Fishing



Forestry



Health



Hospitality



Industrial



Libraries



Meat processing



Metal manufacturing



Office



Road transport



Sawmills



Viticulture and horticulture

Drag tip here to add it to your tips sheet

Show me: All tips Key: Enlarge tip Tip can be edited

ACC processes

- › The Accident Compensation Corporation (ACC) provides comprehensive, no-fault personal injury cover for all New Zealand residents and visitors to New Zealand
- › This means you can apply for ACC's help, no matter how you got injured, or

Access/egress

Editable

- › Ensure steps and handholds are in good condition
- › Always maintain 3 point contact when entering or leaving a cab. Climb up, back down
- › Know where your escape route is, and the cab

Alcohol and drugs

Editable

- › Never mix alcohol or drugs with operating
- › If you take medications that make you drowsy, talk to your boss about alternative duties that don't involve equipment operation or driving

Build your own tip

Editable

Use this for your own work smart tip...

Cab controls

Ensure that your controls are:

- › maintained in good working order
- › easy to operate smoothly, requiring neither too much or too little force
- › laid out so that those of greatest priority and frequent use are easiest to reach

Cab set-up

Editable

Adjust your setup for YOU

- › Seat height/angle so feet comfortable on pedals. Ankles, knees, hips at 90° or a little more.
- › Back rest for good lumbar support, and relaxed work position. Not too upright or

Checklist

Editable

Use this for your own checklist...

Contact

Editable

Cope effectively with stress

Editable

- › Understand the resources at work and in the community to help deal with stress
- › Face up to the big issues, e.g. family/relationship, financial and health. Get professional help/counselling if you need it

Danger signs

Editable

WATCH OUT FOR:

- › Yawning
- › Impatience and slow reaction times
- › Sore or heavy eyes
- › Sweaty hands, hunger, thirst or cramp
- › Not remembering the last few

Distractions

Editable

Don't use your cellphone while operating machinery. Take a break if you need to:

- › eat, drink or smoke
- › use your cell-phone
- › put in a new CD/or change radio station.

Early reporting

Editable

- › Report all discomfort, pain or injury (eg. aching, tingling, stiffness, twinges) as early as possible to your manager
- › Talk to your supervisor about the availability of alternative duties, such as:

Emergency evacuation procedure

Editable

CAB SET-UP

Adjust your setup for YOU

- › Seat height/angle so feet comfortable on pedals. Ankles, knees, hips at 90° or a little more.
- › Back rest for good lumbar support, and relaxed work position. Not too upright or laid back.
- › Seat suspension right for your weight/work conditions, neither too hard nor too soft/bouncy.
- › Seat height and position of controls so arms are relaxed by sides, elbows at 90°-120° with wrists flat. Keep neutral positions where possible.
- › Any screens, RTs or other equipment should be easy to use but not block visibility or movement.
- › Change position regularly to prevent discomfort.

Drag onto your tip sheet to edit.

Print a ready made sheet, or create your own

Tips for cab operators



This resource contains important information for your workplace. Keep the information handy.

RESPONSIBILITIES - THE BASICS

- When you're operating company equipment you're responsible for your actions - so do yourself proud.
- › Follow the site and road rules
 - › Always wear your seat belt
 - › Drive to conditions and within the speed limit
 - › Keep your driver's licence and endorsements current.

ACCESS/EGRESS

- › Ensure steps and handholds are in good condition
- › Always maintain 3 point contact when entering or leaving a cab. Climb up, back down
- › Know where your escape route is, and the cab emergency exits - participate in emergency drills
- › Know the procedures used by emergency services in evacuations
- › Is there anything else going on in the work area that might affect you?
- › Check for uneven ground before getting out.

SEAT BELTS

- › If your cab is fitted with a seatbelt you must wear it
- › Wearing your seatbelt is the law!
- › Seatbelts must be in good condition and fit for purpose
- › Some seatbelts may also provide postural support.

CAB CONTROLS

Ensure that your controls are:

- › maintained in good working order
- › easy to operate smoothly, requiring neither too much or too little force
- › laid out so that those of greatest priority and frequent use are easiest to reach

Avoid having too many or varied controls to manage at one time, such as driving, attached equipment, computer, RT, telephone, clipboard, rear-view camera etc.

This can overload your mental capacity as an operator, which can result in fatigue and greater risk that you'll make a mistake.

CAB SET-UP

Adjust your setup for YOU

- › Seat height/angle so feet comfortable on pedals. Ankles, knees, hips at 90° or a little more.
- › Back rest for good lumbar support, and relaxed work position. Not too upright or laid back.
- › Seat suspension right for your weight/work conditions, neither too hard nor too soft/bouncy.
- › Seat height and position of controls so arms are relaxed by sides, elbows at 90°-120° with wrists flat. Keep neutral positions where possible.
- › Any screens, RTs or other equipment should be easy to use but not block visibility or movement.
- › Change position regularly to prevent discomfort.

NOISE HAZARDS

- › Identify and report sources of excess noise
- › Ensure noisy machinery is maintained regularly
- › Always wear appropriate hearing protection when working, keep it in good condition and replace it when worn.

OPERATOR FATIGUE

- › Take a break every two hours - walk around a stretch
- › Take a power nap 15 - 20 mins
- › Plan your work schedule for regular breaks
- › Get good quality sleep prior to operating
- › Eat well balanced meals at normal meal times
- › Keep hydrated
- › Recognise and manage the 1-3 pm 'sleepy period'.

WORK METHODS

- › Pay attention to stress levels and muscle tension which can quickly lead to discomfort when operating. Deal with causes of stress.
- › Use micropauses and stretches to release tight muscles, particularly for neck and hands. Shaking hands and arms may help to 'let go' tension.
- › Avoid over-stretching or 'spanning' hands when two or more controls are used at once.
- › Use big muscles rather than small muscles.
- › Review design of awkward cab/control layouts
- › Ensure that you get enough cardiovascular exercise - if you sit all day you need to get your limbs and blood moving.

ENVIRONMENTAL ISSUES

- › Ensure air conditioner and temperature controls are working
- › Windows clean, good visibility
- › Seats, armrests, wrist rests in good condition
- › Appropriate shades, window tinting, visors and sunglasses to avoid sun strike, glare and in-cab reflections
- › Beware of blind spots from pillars and fall over, roll over and cab protection gear.

HANDLING TIPS

- › If you have been sitting for a long time, warm up before heavy handling
- › Think and plan before lifting/handling
- › Keep loads close to body
- › Adopt a stable position
- › Get a good hold
- › Avoid bending your back
- › Avoid twisting or leaning sideways
- › Keep your head up when handling
- › Move smoothly
- › Put down load then adjust its position.

WORK TOOLS & EQUIPMENT

- › **Selection:** right size/fit, adjusted to individual
 - › **Equipment:** right tool for the job
 - › **Daily maintenance:**
 - › Sharpen
 - › Clean
 - › Check – springs, screw tightness
 - › Secure any loose items in the cab
- If in any doubt, speak to your supervisor.

Injury cost calculator

Whether a worker gets injured at home or at work, your business is affected. You need to find and train a replacement, deal with the paperwork and still keep everything working. What if wages for the replacement worker are just the beginning of a larger impact on your bottom line? Do you know the real cost of an injury?

How to use the calculator

The injury cost calculator has two parts:

1. Case studies - examples of costs to employers that result from injuries in work, home and sport settings.
2. Create your own - use costs from your business to build your own injury scenario. Find out what the real cost of an injury could be.

[Start the calculator.](#)

Note:

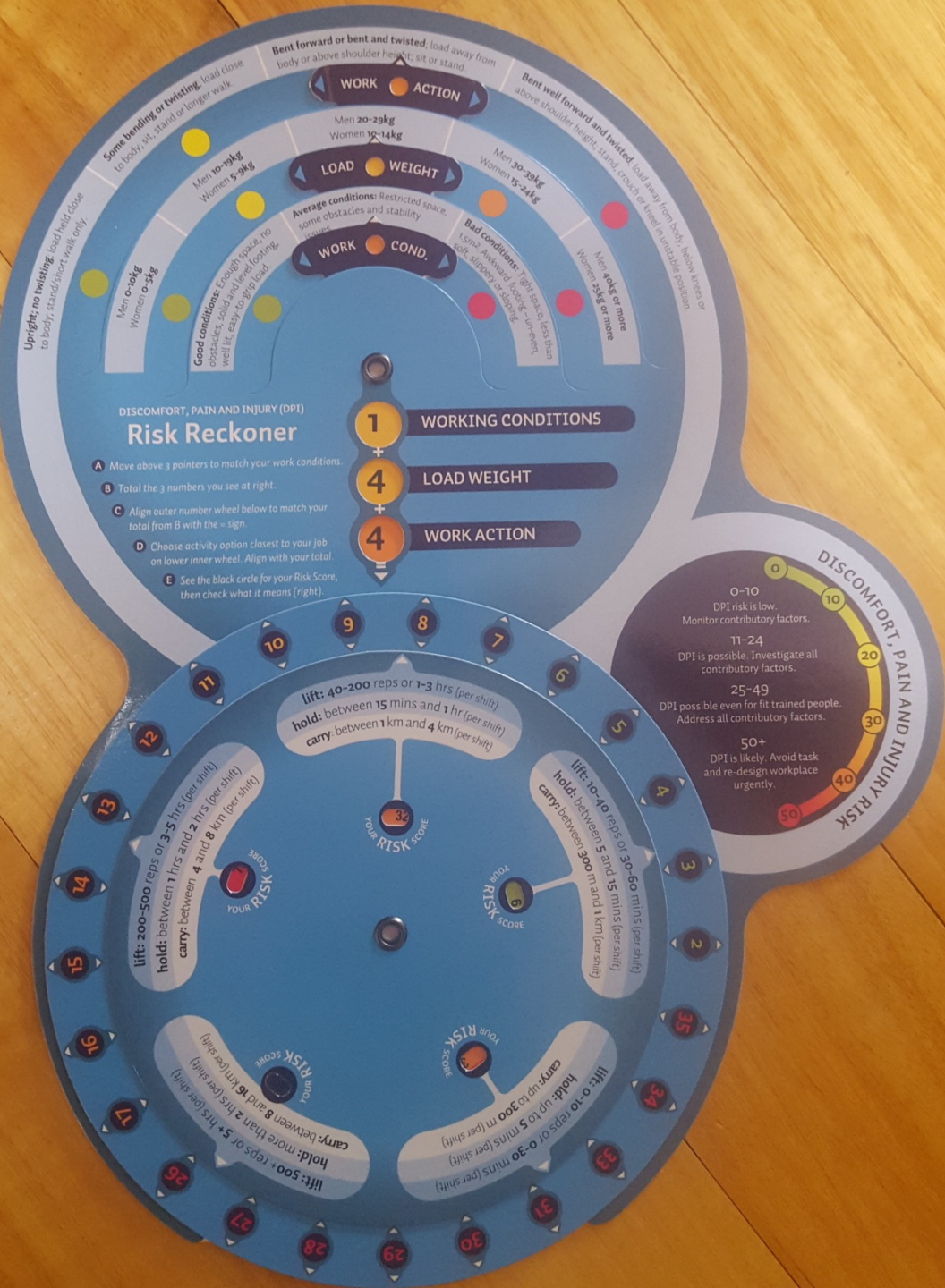
This injury cost calculator doesn't show how workplace injuries may affect the ACC work levies you pay, as a result of experience rating.

[Experience rating](#) is a system of modifying a business' ACC work levy based on its claims history. Under the experience rating framework, employers who have lower-than-average injury rates, with better-than-average rehabilitation or return to work rates, may receive a discount on their ACC work levy. Those with worse-than-average claims experience may receive a loading on their levy.

Last updated: 7 July 2014

Last reviewed: 10 June 2014

- Risk Reckoner – manual handling risk



Systems and practices checklist

Workplace:

Assessor:

Date:

System/Practice	Tick	Comment
1. Management commitment and awareness		
- Senior managers have received a high level overview of discomfort, pain and injury		
- Management have displayed commitment		
- Sufficient time and money has been allocated to preventing and managing discomfort, pain and injury		
- Workplace has an active H&S system		
2. Review		
- Early report forms and accident registers are reviewed and trends identified		
- Hazards are well managed and documented		
3. Planning		
- The organisation has a plan for preventing and managing discomfort, pain and injury		
4. Training		
- Staff understand the seven groups of contributory factors for discomfort, pain and injury		
- New staff are given training in early reporting		
5. Hazard Management		
- Discomfort, pain and injury hazards have been identified using contributory factors assessment		
- Control plans have been developed and reviewed periodically		
6. Early Reporting		
- The work climate supports early reporting and action		
- Staff know when and how to report		
- Staff are reporting problems early		
- Supervisors have guidelines and processes to deal with reports		
- Supervisors investigate each report within 24 hours		
7. Injury Management/ Stay at Work/Return to Work		
- The company has a range of identified alternative duties for each position		
- Employees are provided with a referral to give the treatment provider		
- Employees off work are contacted regularly and encouraged to visit and keep in touch		
- There is regular liaison with treatment providers and ACC case managers		



PREVENTION. CARE. RECOVERY.

Te Kaporeihana Āwhina Hunga Whara

- Systems and practices checklist
- Start here...

MSD interventions

- Good H and S systems that incorporate contemporary knowledge of MSD
- Early reporting of discomfort
- Robust hazard identification (DPI/ergonomics approach) and associated actions to eliminate or minimise hazards
- Design of equipment – modification and adjustment issues, and pre-purchase work
- Education for supervisors/managers re: MSD
- Induction/training of workers re: self-management aspects

Consider:

- Hydration status of workers
- Fitness – cardio/strength
- Break-taking practises – micropauses, statutory work breaks, task breaks
- Rosters/shifts/sleep
- Vibration – whole body and hand/arm
- Workplace design
- General health/wellbeing/’stress’

References

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Marion Edwin CNZHFE
Ergonomist
Optimise Ltd
Motueka

027 626 1300

marion@optimiseltd.co.nz
www.optimiseltd.co.nz