Muscle Minding

A Guide for the Prevention of OOS in the Meat, Poultry and Fish Processing Industries

OSH
OCCUPATIONAL SAFETY & HEALTH SERVICE

DEPARTMENT OF LABOUR
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Published by the Occupational Safety and Health Service
Department of Labour
Wellington
New Zealand

First Edition: August 1997

ISBN 0477-03598-1

CONTENTS

SECTION 1

ABOUT THIS RESOURCE KIT

A. PURPOSE OF THIS GUIDE

This guide is part of a resource kit to assist employers to prevent Occupational Overuse Syndrome (OOS) in the food processing industries, specifically in the processing of red meat, poultry and fish (including shellfish).

OOS is a costly problem in these industries. It also results in a large number of ACC claims and notifications of serious harm to the Occupational Safety and Health Service (OSH).

This guide outlines a strategic approach to preventing OOS. The material may be used as part of training or orientation for new staff, returning workers and existing workers in the industry. It is in loose leaf format so that individual sections can be removed, copied and used separately as required.

Other, more general, information on OOS management is already available from OSH and should be used to supplement what is here. Manual handling is also a common problem in the food processing industries, and there are OSH publications that deal with this as well. (See the Bibliography for a list of relevant publications.)

The recommendations in this guide are all based on current standard practice. So far, reports on what 'works well' in the prevention of OOS in the food industry are not available. Research on the effects of interventions such as the one proposed here have not been reported.

Commitment by management is essential before implementing any programme to address OOS problems. An effective programme will adopt a team approach and involve all employees, from workers on the processing lines to high-level managers.

Although intended primarily for employers, this guide will also be of use to occupational health and safety practitioners, those working within the industry, and anyone else with an interest in reducing the effects of OOS.

OSH can provide initial assistance in dealing with OOS problems and a list of OSH branch offices is included in this guide (pages 83-84). For further assistance, you should contact one of the private consultants who specialise in this field (refer to the ACC publication *How to Select an Occupational Safety and Health Consultant: A Guide for Managers).*

B. CONTENTS OF THIS RESOURCE KIT

This resource kit contains the following items:

Guide:	*Muscle Minding: A Guide for the Prevention of OOS in the Meat, Poultry and Fish Processing Industries*
Video:	*Muscle Minding: for People Processing Red Meat, Poultry and Seafood*
Poster:	*Stay Loose, Avoid OOS*

As indicated, this guide is primarily a resource for employers and management. The video and poster are aimed at employees and show how they can help to avoid overuse problems in the workplace.

Further copies of the poster are available from OSH.

C. STATUS OF THIS GUIDE

This guide is not a code of practice. It gives guidance on reducing the incidence of occupational overuse injuries. The overall approach is based on the Health and Safety in Employment Act 1992, and following the guide will assist workplaces to comply with the requirements of the Act.

D. ACKNOWLEDGEMENTS

In producing this resource kit, a number of workplaces and people have been of assistance and OSH would like to acknowledge their help in commenting on early drafts. We particularly thank those workplaces that allowed us to visit their premises and film staff in the making of the video. The authors would like those concerned to accept this as a personal acknowledgement, as for various reasons, OSH may not credit specific companies.

SECTION 2 OOS: WHAT IT IS AND WHY IT OCCURS

INTRODUCTION

This section gives a general description of what Occupational Overuse Syndrome is, why it's believed to occur, and how it's diagnosed. It also looks at the different occupations where OOS is likely to be a problem.

A. GENERAL DESCRIPTION OF OCCUPATIONAL OVERUSE SYNDROME

Occupational Overuse Syndrome (OOS) is an umbrella term covering a range of disorders characterised by pain and/or other sensations in muscles, tendons, nerves, soft tissues and joints, with evidence of clinical signs. Symptoms such as pain, discomfort and muscle weakness may continue even after the initial clinical signs have diminished.

The disorders are caused, or significantly contributed to, by occupational factors that include prolonged muscle tension, repetitive actions, forceful movements, and sustained or constrained postures, which exceed the usual ability of the body to rapidly recover.

Other medical conditions causing the same or similar symptoms have been excluded (e.g. some rheumatological conditions, prolonged inactivity, or disuse of muscles).

CLASSIFICATION OF OCCUPATIONAL OVERUSE SYNDROME

Current opinion suggests that OOS can be classified into three groups which are referred to as localised inflammations, compression syndromes and pain syndromes (see table overleaf).

Scientific evidence seems to indicate that, in the food processing industries, localised inflammations and compression syndromes are far more common than pain syndromes.

Table 1: The Classification of Occupational Overuse Syndrome

Occupational Overuse Syndrome: Some Examples of Subtypes		
Localised Inflammations	**Compression Syndromes**	**Pain Syndromes**
Trigger finger	Carpal tunnel syndrome	Chronic pain syndrome
De Quervain's tenosynovitis	Thoracic outlet syndrome	Myofascial syndromes
Epicondylitis	Ulnar nerve compression	Fibromyalgia
Rotator cuff syndrome	Radial nerve compression	Regional pain syndrome
Bursitis		Complex regional pain syndrome (Reflex sympathetic dystrophy)
Cervicothoracic dysfunction		
Postural syndromes		
Muscle strain		

Explanatory notes for Table 1

- OOS is a complex problem that invariably has multifactorial causes. The number of possible factors is large, with much potential for interaction. Organisational factors (such as excessive workload), psychosocial factors (both in and outside of work) and individual characteristics are known to increase the risk of developing OOS. These all have to be taken into account when managing OOS.
- OOS should not be confused with the aches and pains that are a common part of life.
- The disorders included in the sub-types of OOS above can also exist alone, without overuse or occupation being the cause. These disorders would then not be classified under the umbrella term OOS.
- OOS is not a clinical entity; it is an umbrella term. For this reason OOS on its own is not an adequate diagnosis. All classifications of OOS should therefore be accompanied by a subtype, provisionally based, if necessary. For example, OOS - Carpal Tunnel Syndrome (provisional) or OOS - Epicondylitis. Multiple sub-types can also be indicated, e.g. OOS - Epicondylitis and Cervicothoracic Dysfunction.

- There is no distinction between paid and unpaid occupations for the purposes of the definition of OOS, and medical management will be similar. However, cover under the Accident Rehabilitation and Compensation Insurance Act 1992 will depend, among other things, on whether the occupation in which the condition arose was paid or unpaid.
- There is some evidence that the localised inflammations and compression syndromes are more common in manual work compared to keyboard work, where the pain syndromes appear to be more common.

B. WHY OOS OCCURS

It's useful to consider the causes of OOS under two headings: what people do, and why they do it.

Table 2: OOS in Terms of What People do and Why they do it

In terms of what people do.	***In terms of why people do those things.***
People hold muscles tense for long periods.	The workstation and/or workplace is poorly designed. Too much work is done. Insufficient breaks. People are poorly trained.
People repeatedly make forceful or jerky movements.	The work requires these movements. People are poorly trained and use poor techniques.
People drive themselves hard in response to the demands or work.	People drive themselves beyond their capacity. The demands of work are unreasonable, or are linked to a bonus system.
People react to social stressors, at home and work.	People are required to work beyond their capacity or their at coping skills are poorly developed. People are unhappy at work.
Personal factors play a part.	A variety of factors may play a a part here; i.e. individual, physiological and psychological characteristics.

This table mentions various possible causes of overuse syndromes but makes no comment about the relative importance of each type of cause. This will vary in each individual case of overuse syndrome. Current opinion, however, is that no one cause should be isolated as the cause, and that prevention strategies should therefore proceed along a broad front.

Much in the outline presented in Table 2 derives from the muscle tension theory of overuse syndromes, which states, in brief, that holding muscles tense for too long without a break is the primary cause of the initial discomfort and pain of overuse syndromes.

The muscle tension theory does not explain everything about the causes of overuse syndromes, in particular why some people develop pain that is more severe and longer lasting other people. Nor does it explain why some people spend long periods off work while others, with similar levels of pain, return to work.

Developments in knowledge about the human pain system indicates that there are physiological mechanisms through which pain can be amplified from the initially mild symptoms. It has been proposed that some people are more susceptible to developing pain in this way than others.

Many practitioners in the field of occupational medicine believe that 'illness beliefs' are the most important factor in the return to work of people off work with OOS.

Illness beliefs are beliefs about their illness held by the person affected and include:

- The belief that pain is harmful or disabling, resulting in fear-avoidance behaviour such as guarded movements and fear of movement;
- The belief that all pain must be abolished before attempting to return to work or normal activity;
- The expectation of increased pain with activity or work;
- Catastrophising: the belief that pain is uncontrollable;
- A passive attitude to rehabilitation.

Various factors may influence illness beliefs. An automatic referral to physiotherapy and other manual

therapies or giving a person time off work (especially without contact with the workplace) are two such factors.

Another difficulty with the muscle tension theory is that it does not provide an obvious explanation for the growing emphasis on psychosocial factors as causes of overuse syndromes.

C. RECOGNISING THE INITIAL SYMPTOMS OF OOS

The early symptoms of the localised forms of OOS such as 'tennis elbow' are often identifiable as something other than normal muscle pain.

The symptoms of OOS that develop into pain syndromes, however, are often those of normal muscle discomfort. These are readily reversible in the early stages, and when there is time for recovery, muscle aching and pain normally disappear. If there is insufficient time for recovery, then more serious problems may develop.

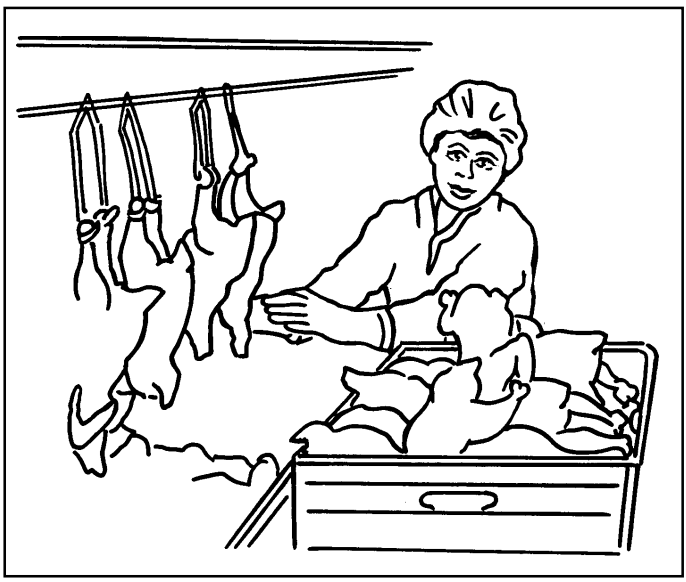
Initial feelings experienced by people with OOS may include tingling and numbness in the fingers and hands; discomfort and aching in muscles; and discomfort or pain at the points where a tendon meets the bone, where a tendon runs through a sheath and in the tendon itself.

D. OCCUPATIONS WHERE OOS IS COMMON

Overuse syndromes are found in a large number of occupations, as well as among people who are not in paid work. ACC statistics show that people in the following occupations — to name a few — are affected:

- food processing workers;
- kitchen workers;
- sewing machinists;
- cleaners;
- panel beaters;
- librarians;
- clerks;
- carpenters;

- metal polishers;
- painters;
- musicians;
- electronic assemblers;
- mail sorters;
- hairdressers;
- courtroom stenographers;
- sign language interpreters;
- keyboard operators.



Food processing is one of many occupations where OOS occurs.

SECTION 3 OOS AND THE HSE LEGISLATION

INTRODUCTION

This section briefly reviews the requirements of the Health and Safety in Employment (HSE) Act 1992 and the Health and Safety in Employment (HSE) Regulations 1995. It then relates these requirements to the specific hazards of OOS in the food processing industries.

HEALTH AND SAFETY IN EMPLOYMENT ACT 1992

Under the HSE Act 1992, employers must take all practicable steps to provide a workplace free from hazards. The Act places particular emphasis on the detection and management of significant hazards.

The Act is summarised in a number of OSH publications. In brief, employers are required to take the following steps:

1. Design for safety and health.
2. Identify, assess and control hazards.
3 Monitor employees' exposure to hazards and their health.
4 Provide information, training and supervision.

Employees also have responsibilities under the Act.

The Act makes a distinction between harm and serious harm, and between hazards and significant hazards. Where serious harm (which is defined in the First Schedule to the Act, see Appendix K) has occurred — or has the potential to occur — employers must take all practicable steps to reduce the likelihood of serious harm occurring again.

A diagnosis of occupational overuse syndrome can indicate that serious harm has occurred and, by implication, that significant hazards exist in the workplace. All practicable steps must therefore be taken to prevent harm occurring or recurring.

These steps are arranged in a hierarchy of actions:

(a) *elimination* of the hazard;

(b) *isolation;* and

(c) *minimisation*.

Where the minimisation option is used, effective systems to monitor exposure to significant hazards and to monitor personal health are required.

HEALTH AND SAFETY IN EMPLOYMENT REGULATIONS 1995

The HSE Regulations impose duties on employers, employees, designers, manufacturers and others and relate to general safety in the workplace and to the design of plant and equipment.

A. APPLICATION OF THE HSE ACT

DESIGN FOR SAFETY

Employers should ensure that the physical aspects of the workplace are designed to be safe. (This is discussed later under Application of the HSE Regulations).

Apart from the physical design of workstations and equipment, other risk factors for OOS that relate to the 'design' of work are the way work is organised, especially its timing, payment systems and whether excessive overtime is worked.

Some assessment will be needed of the amount of work to be done in the time available, in particular, the building in of time for breaks and the opportunities to take micropauses*.

IDENTIFY, ASSESS AND CONTROL HAZARDS

Employers must systematically identify hazards in the place of work (these include existing and potential hazards). These hazards must be assessed — and regularly reviewed — to determine whether or not they are significant hazards. If it is determined that a hazard is a significant hazard, further action will be required.

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* A micropause is a short break in work, of 5-10 seconds duration, accompanied by muscle relaxation. It allows for the restoration of blood flow in muscles which have been tense.

A significant hazard means a hazard that is an actual or potential cause or source of:

(a) serious harm; or

(b) harm, (being more than trivial), the severity of whose effects on any person depend (entirely or among other things) on the extent or frequency of the person's exposure to the hazard; or

(c) harm that does not usually occur, or is not usually easily detectable, until a significant time after exposure to the hazard.

The Act sets out the hierarchy of actions that must be followed when a significant hazard is identified:

(a) Where practicable, the hazard must be eliminated.

(b) If elimination isn't practicable, the hazard must be isolated.

(c) If it's impracticable to eliminate or isolate the hazard completely, then the employer must minimise the hazard to employees.

In addition, the employer must, where appropriate:

- Ensure that protective clothing and equipment is provided, appropriate to the task, and is accessible and used.
- Monitor employees' exposure to the hazard.
- Seek the consent of employees to monitor their health and, with informed consent, monitor employees' health.
- Provide information and training (see Section 5).

The results of monitoring can be used to :

- Reassess the hazards; or
- Gauge the effects of the methods used to minimise the hazard.

Employees must be given the results of monitoring.

B. METHODS OF IDENTIFYING AND ASSESSING HAZARDS FOR OOS

A number of standard methods for identifying hazards are discussed in OSH publications, such as *How to*

Identify and Control Hazards. These methods are summarised here, with particular reference to OOS.

When hazard identification is being carried out, employers are required to provide employees with the opportunity to be involved. It's also important to involve employees when designing and redesigning plant, equipment and work methods.

ASSESSING WORKLOADS

The workload should be assessed to see if it's within the capacity of the people doing the work. As a first step, the ways in which the workload will be measured should be described.

It can be difficult to assess from first principles if a particular amount of work can be accomplished by a group of workers. This is due to the inherent difficulty of this type of assessment, the variability between individuals, and the effects of training.

Often, a company uses set criteria to determine the amount of work to be accomplished. It's sensible to discuss these criteria with the workers and their representatives. If a change of workload is introduced, it should be carefully monitored.

It should be noted that people do respond to increased demands, but only up to a point. After a person reaches that limit, degradation of performance sets in. This may be apparent in the short term, but may not show up until the longer term.

PHYSICAL INSPECTIONS

Inspections are carried out by walking around the workplace, preferably in consultation with employee representatives and staff who are familiar with the area and the work. A checklist may be useful as a memory aid. Physical inspections can be broken down into smaller and smaller areas as expertise develops.

PROCESS ANALYSIS

Hazards are identified at each stage of the process. An example of this could be a fish filleting factory, where:

1. The product enters the factory warehouse.

2. The fish are weighed, stacked and put into cold storage.
3. Cutting lines then behead, gut, fillet and skin the fish.
4. The product is then trimmed.
5. The fish is layer packed.
6. The fish is check-weighed again, then frozen.
7. Product is delivered to suppliers.

Each stage of dealing with the product can pose different hazards, which can be assessed in turn.

ACCIDENT ANALYSIS

Details are analysed of both serious and non-serious harm accidents and incidents.

VIDEO FILMING

Video filming is a valuable method of evaluating movements, especially where work is repetitive and performed at a brisk pace. Slow motion replay can be used to study actions in detail.

Video filming can also be used as a training tool. People often experience muscle discomfort, aches and pains because of the hand and arm movements they make. These undesirable movements may be forced upon them by the design of their workplace and hand tools, in which case the need for redesign will be made clear by the video. On the other hand, they may not know they are making undesirable movements and the video will then show these.

RULA TASK ANALYSIS

Rapid Upper Limb Assessment (RULA) is a specific task analysis method. Muscle use, force applied and posture are assessed according to a standard method to give a final single-number score for the task. The method is not a precise indicator of risk but can be used to prioritise tasks for action. Using the method will raise

awareness about some of the risk factors for OOS. The score can be used to prioritise tasks for attention.

Copies of the method and score sheet are available from all OSH branches.

C. MANAGEMENT OF HAZARDS

The obvious solution is to remove hazards. Engineering methods are the preferred control option for hazards that arise from the design of the workstation, tools and equipment. Such solutions include redesign of the work area, and the tools and equipment used, and careful attention to the design of the flow of work and how the product enters the work area. The focus should be on reducing prolonged muscle tension, repetition, force and excessive manual handling.

Hazards posed by the organisation of the work require a different sort of control. This is discussed in the next section.

D. MONITORING

The HSE Act requires employers to monitor the employee's exposure to a significant hazard when it cannot be eliminated or isolated, and the personal health of the employee in relation to the hazard.

As a guide to the types of monitoring that can be carried out:

1. Posture can be assessed by careful observation. Each body part can be assessed, and the posture recorded can be judged against postural guidelines.
2. Muscle tension may be monitored by the use of electromyography. (Electromyography is the recording of electrical currents generated in active muscles.)
3. Cycle times of the work tasks can be measured. The times spent with excessive muscle tension and the times spent relaxed can be recorded.
4. Personal health may be monitored by self-reports of musculoskeletal discomfort. It's essential to have an early reporting system so

that when pain is experienced, it can be investigated straight away, and any changes made where necessary. (See Appendix E).

E. INFORMATION, TRAINING AND SUPERVISION

Appropriate information must be provided to the employee on identified hazards to which they are exposed, as well as specific health and safety information such as:

- health and safety policies;
- how to prevent occupational overuse and manual handling injuries;
- reporting of hazards;
- early reporting of symptoms to supervisors;
- standard operating procedures;
- emergency procedures;
- specific processes;
- the purpose of guards and safety devices; and
- the use and maintenance of personal protective equipment.

Employers should consider language and cultural differences in the provision of information to employees.

Training should be an ongoing process and be tailored to the individual's needs, as people don't learn at the same rates. It should include formal and informal sessions.

Supervisors need to be trained to detect incorrect postures and poor working techniques. They also need to know what to do with early reports of discomfort.

There are a number of trainers who are able to provide specialist training (refer to the ACC publication *How to Select an Occupational Safety and Health Consultant).*

F. ACCIDENT REPORTING, RECORDING AND INVESTIGATION

There needs to be a means for employees to report aches and pains when they do arise. The importance of

early reporting is crucial in both detection and further prevention of OOS problems.

There may need to be a system initially to cope with excess reporting — once awareness has increased within the plant.

An accident register (in the prescribed format) must be maintained by all employers, where non-serious harm and serious harm is recorded and investigated. All incidences of serious harm must to be reported to OSH as soon as possible after their occurrence, then notification must be made in writing, within 7 days.

If a diagnosis of OOS is made, or if a worker is unable to carry out normal duties because of the severity of work-related pain, then serious harm may have occurred. As a guide, being unable to carry out normal duties for seven days due to these causes should be taken as evidence of serious harm and should be reported to OSH.

Serious harm is permanent loss of bodily function; or temporary severe loss of bodily function, including musculoskeletal disease (see Appendix K).

G. REVIEW OF WORKPLACE

There should be planned, regular review inspections of the workplace, together with an effective hazard reporting system. Checklists and hazard reports can be used as a guide.

The accident/incident register should also be regularly checked.

H. DUTIES OF EMPLOYEES

Employees also have duties under the HSE Act. They must:

- Use or wear the equipment, and appropriate protective devices or clothing that is specified for the work.
- Inform supervisors of any hazard that may put any person in danger.
- Notify supervisors immediately of any discomfort experienced.

- Not carry out any activity that may cause harm to themselves, or to anyone else.
- Not remove any protective device, e.g. a knife guard.

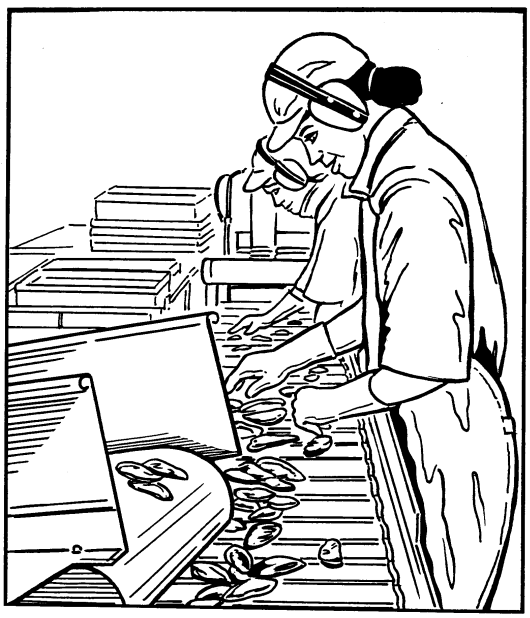
Where equipment, protective device or clothing is supplied by the employer, it should be appropriate for the task and fit the individual. Workers should receive training in the use of this equipment.

I. APPLICATION OF THE HSE REGULATIONS: THE DESIGN OF PLANT AND EQUIPMENT

Design for human use should be the first consideration when reorganising a workstation or when designing a new work area. Consideration also needs to be given to hygienic design and ease of cleansing.

Regulation 66 (Part VII) of the Health and Safety in Employment Regulations requires that ergonomic principles be taken into account by the designers and manufacturers of plant and equipment.

Workstation design begins with an appreciation of safe body positions so that the 'shape' of the workstation is correct (see Appendix C) and incorporates anthropometric data so that the workstation is the correct size (see Appendix D). Size limitations reflect the need to make the workstation *big enough* for tall



Workstation designed so that work can be performed close to the body.

people, and to bring things that must be reached for or grasped *close enough* for short people.

The design of a workstation should accommodate each person likely to use it, rather than just the 'average' person. For this reason, workstations may need to be adjustable.

The degree of adjustability required will also depend on the number of different people who use the workstation and on the nature of the work.

Poorly designed workstations may require people to work with prolonged, undesirable postures; to make overly long reaches; or to twist or bend their bodies. These are risk factors for OOS.

To summarise these considerations:

1. Design workstations to 'fit' the person, using the correct 'shape' and 'size'.
2. Work tables or stands may need to be adjustable when a range of employees use the same workstation.
3. Design equipment and tools to reduce muscle forces and prevent prolonged or frequently repeated manual handling actions.
4. Suspend heavy tools or objects from an overhead support.
5. Substitute power tools for manual tools.

SECTION 4

HAZARD IDENTIFICATION AND CONTROL OPTIONS

INTRODUCTION

Identification of hazards relating to causes of occupational overuse syndrome involves consideration of the worker, their actions, their workload and environment, and their workstation and tools (the knives and utensils they use on a regular basis).

The worksite analysis needs to identify existing hazards and conditions, operations that create hazards, and areas where hazards may develop. It should also include regular assessment of injury records to identify injury patterns: where injuries occurred, what type of injuries occurred, and what type of tasks were involved.

The following lists are a guide to assist with hazard identification and control. They are not exhaustive but may be used as prompters.

Working with arms raised above the heart is a risk factor in the development of OOS.

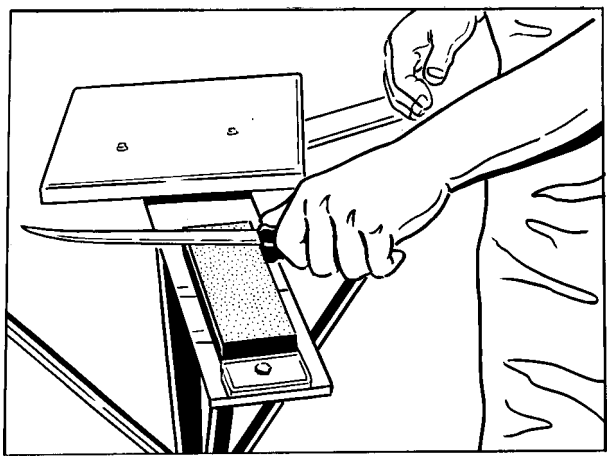
A. WORK ORGANISATION AND TASK SCHEDULING

This is an important subject and considers the impact that the nature of the work and the workload may have on the worker.

Work organisation is the objective nature of the work process. It is the description of the way work is structured, supervised and processed and the institutional features of work such as the nature of the organisational chart; who is the boss; who has power, authority and responsibilities; and how work gets done. The nature of the tasks, including workload and task content, are also part of work organisation.

The practical factors that need to be taken into account in the workplace can include: the clarity of the tasks, their monotony, the chain speed or rate at which the product travels past the workers, other time pressures, staffing levels, pay systems, the effect of busy seasons and other increases in workload, breaks in the work and overtime and shiftwork.

The nature of the tasks can change in a number of circumstances. For example: when new technology is introduced, when the speed of the line is changed, when different types of product are being processed or when the temperature of the environment or the product on the line is altered. Regulating the speed at which product enters the processing line is extremely important and must be controlled.



Provide time for knife sharpening and tool maintenance.

CONTROL OPTIONS:

To ensure task clarity:

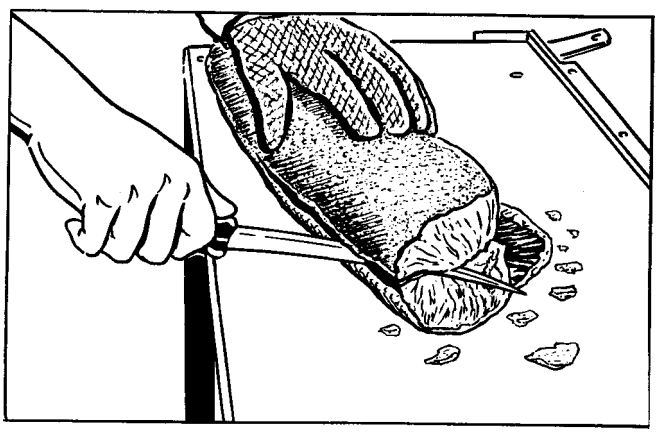
- Provide clear job descriptions and training.
- Ensure workers are familiar with the performance specification.
- Provide feedback on whether workers are meeting the performance specification.
- Create clear lines of reporting.

To provide interesting work:

- Reduce monotonous tasks to a minimum.
- Rotate tasks that are monotonous.

To prevent unreasonable workloads:

- Establish workloads that are sustainable in the long term — undertake an assessment of the speed of the production line versus injury costs, and maintain a level of work that prevents musculoskeletal problems.
- Design a work/rest schedule that creates a balance between health and productivity. A 10-minute break every hour is advisable in many cases.
- Have employee input into the determination of workload.
- Have a means to assess staffing needs in special cases — when operators are absent unexpectedly or for extra duties or seasonal work.

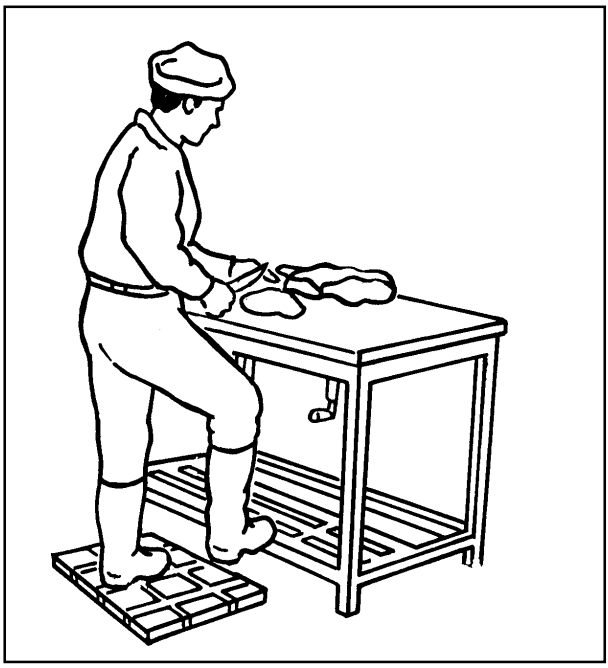


Mesh glove should be worn to protect holding hand.

- Make allowances for breaks and micropauses in the design of work schedules.
- Keep overtime and shiftwork to a reasonable limit.
- Allow for a gradual build-up to full speed at the start of a season or when a person is starting a job.
- Provide time for sharpening tools and tool maintenance.
- Ensure pay does not relate to a bonus system or piece rate.
- Ensure payment systems do not increase workloads.

B. AWKWARD POSTURES

As is well established, the adoption of certain postures may act to load muscles forcefully and/or require them to contract for long periods. Poor postures may result from the poor design of equipment and facilities; a lack of education, knowledge and training; or a general lack of ability to sense the state of one's own body.



Provide adjustable workstations and allow for footrests.

CONTROL OPTIONS

- Assess job tasks, with the redesign of the work area being the first option.
- Train employees on how to use tools and correct postures.
- Consider how individual tools are used.
- Obtain feedback from employees on trials of new workstations and tools.

C. TASK INVARIABILITY

This term applies to both the physiological and psychological 'sameness', which are characteristic of many tasks that are repetitious and unchanging. Invariability often implies constant muscle tension.

CONTROL OPTIONS

- Provide job rotation so that workers carry out tasks that use different muscle groups.
- Organise team work within areas so that members of the team can share the different jobs.

D. STATIC LOAD

Muscles, tendons and nerves may all respond to static loading in ways that are undesirable. Examples of static loading are: work with arms outstretched; work above the heart, work with shoulders raised; lifting heavy weights; holding meat, fish, shellfish in the non-knife hand; and grasping a knife.

CONTROL OPTIONS

- Reassess employee tasks.
- Measure load and forces used (by use of video, task analysis).
- Bring work closer to centre of body (vertically and horizontally).
- Reduce weights to be lifted.

E. FORCEFUL AND RAPID MOVEMENTS

Many external influences on the body require the muscles to exert force. The sizes of the forces that the body must generate to react to the outside world, and the manner in which those forces vary with time (variability, repetitiveness, work-rest cycle, recovery times, breaks), will influence tension in muscles, pressure in the carpal tunnel or in a muscle, friction between a tendon and the sheath it runs in, and pressure or irritation of a nerve.

Some factors that modify the musculoskeletal load are its duration, the type of grip used and the diameter of the handle gripped, wrist postures, the use of gloves, and working technique or behaviour.

The design of hand tools and workbenches and the location of parts to be worked on or grasped play a major part in preventing hazards such as from:

- Slippery tool handles;
- Heavy hand tools — more force is required;
- Deviation or flexion/extension of the wrist;
- Blunt knives;
- Trolleys that are awkward to manoeuvre;
- Pallet racks of awkward height, weight, shape;
- Inadequate clothing or gloves;
- Holding the product while cutting;
- Vibration from power saws and hand tools.

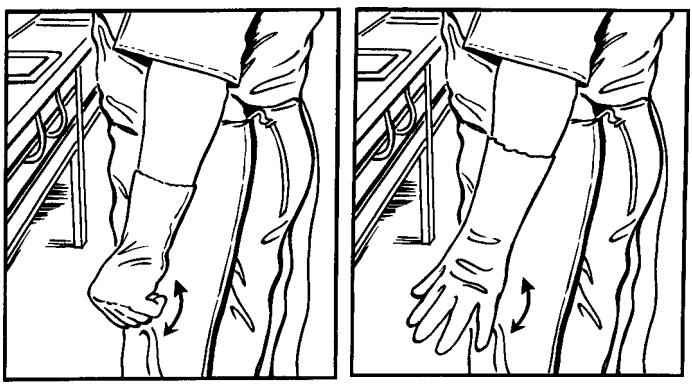
CONTROL OPTIONS

- Use knife or tool handles with texture grips in preference to those with ridges and grooves. Wide handles should be used for ease of grip. There should be a range of handle sizes available to meet the needs of different people.
- Have a wide range of equipment available for special needs, such as left-handed knives. Knives should be trialled to ascertain their effectiveness, suitability and grip strength required in use.
- Suspend heavy tools from tool balancers.

- Design and select tools that are of the minimum weight. The maximum weight of a hand tool should be 4.5 kg.
- Have a regular maintenance schedule for tools and equipment.
- Have a policy on knife sharpening. Provide training in sharpening and safe handling techniques.
- Purchase trolleys designed for the job; maintain them regularly, i.e. check wheels and oil regularly.
- Packing areas should accommodate a range of heights. It's preferable to have racks that move up and down with a range of weights. Packing boxes and conveyor belts should be at approximately waist height.
- There should be as little manual handling as possible of the product, especially if it's over 20 kg.
- Regularly maintain and upgrade all vibrating power saws.

PERSONAL PROTECTIVE EQUIPMENT

- Shoes and gumboots should be comfortable nonslip, heavy-duty.
- Knife-guards should be adequate for knife and sharpening equipment
- Protective clothing should be warm and unrestrictive.



Stretching and warm-up exercises before work promote blood flow to the fingers.

- Arm guards should protect the 'holding' hand.
- Mesh gloves should be worn.

F. FIT, REACH AND SEE

Operators need to be able to *fit* the general height and size of their workstations, *reach* the items they work with and *see* clearly.

The following is a list of common errors:

- The workstation is too high or too low.
- The workstation is nonadjustable.
- Operators need to reach too high, too low or too far forward to obtain necessary equipment.
- No stable base is provided on which to stand.
- There is no choice of standing or sitting position to work in.
- Work must be consistently performed above the level of the heart.
- Work requires a twisting or turning movement.
- Work requires excessive bending of the neck or back.
- Working conditions are cramped.
- Lighting is too low for the task.
- Lighting is too bright or poorly positioned, causing reflections and glare.

CONTROL OPTIONS

- Design or select the workstation to fit a specific task.
- Ensure work space is large enough to allow for the full range of movements required.
- Provide an adjustable workstation which can be altered for the operator's height. (Time to make the adjustments at the start of each shift will be needed).
- Provide adjustable fixtures such as footstools, stands and platforms that can be changed to suit different workers' proportions.

- Place equipment that is used frequently within easy reach.
- Provide space to enable work to be carried out without restriction.
- Fit rubber stoppers on the bottom of tables for stability.
- Analyse tasks. Many tasks in the food industry are best carried out at waist level. This is not an inviolable rule, and precision tasks may need to be done at a higher level than this.
- Analyse the position required to carry out the task; adjust workstation; bring work closer to the operator.
- Boning areas should have adjustable tables and a footrest for the employee so that they are working at approximately waist height.
- Provide adequate lighting over workstations, positioned to avoid reflections.
- Obtain ergonomic expertise when redesigning work areas.

G. COLD AND VIBRATION

This category of hazards includes:

- Exposure to low temperatures (in the chilled boning room).
- Shock and impact loading (e.g. when using nut-runners, or the hand as a hammer).
- Whole body and hand arm vibration (vibrating hand tools cause an automatic muscle tightening and may lead to disease).
- Contact with sharp edges ('handlebar palsy' in cyclists, 'bowler's thumb', using scissors).

Some have suggested that high noise levels may also increase muscle tension.

COLD

Cold conditions may precipitate symptoms of OOS. When we perform dynamic work (with muscle movement) the body generates its own heat, especially

when the work is vigorous. In the food processing industry, the work is 'static' and there's little heat production. Therefore it's very important to keep warm and relaxed.

Cold draughts are common from compressing machinery. Cold air may cause feelings of local cooling of flesh. This can be so great as to reduce the blood supply to the extremities, which can increase the risk of the problem.

CONTROL OPTIONS

- Provide protective equipment and warm clothing in cold environments. Clothing needs to be unrestrictive and of a reasonable fit.
- Provide gloves where necessary.
- Encourage workers to wear thermal underclothes.
- Redirect cool air blowing onto workers from pneumatic tool exhausts and prevent drafts.
- Ensure that workers who spend long periods in freezers take their breaks in warm areas.

VIBRATION

Vibration is a risk factor for OOS. Raynaud's phenomenon or 'white finger' — a reduction in the blood supply to the extremities, usually the middle digits — may occur in response to vibration, particularly in cold and wet environments.

When it occurs, the fingers must be rewarmed slowly.

CONTROL OPTIONS

Stretching and warm-up exercises should be carried out before work to lessen the effects of the vibration. Employers should:

- Select vibration-free equipment.
- Reduce vibration at source.
- Reduce the time employees spend using vibrating equipment.
- Minimise the occurrence of vibration by maintenance of machinery.

- Mount equipment to prevent the transmission of vibration to operators.

H. PSYCHOSOCIAL CHARACTERISTICS OF WORK

Psychosocial factors are the individual, subjective perceptions of the work organisation factors (see above). They often have the same names as the work organisation factors but are different in that they carry an emotional value for the worker. Thus, the nature of supervision can have positive or negative psychosocial effects..

Research suggests that if people can answer 'yes' to the questions that follow, then they are likely to be at significantly less risk of musculoskeletal discomfort:

- Do you enjoy your work?
- Do you get on well with your supervisor?
- Do you get on well with your co-workers?
- Do you get support when you need it?

How people respond to these questions will depend, to some extent, on their perception of the organisational structure, e.g. their job future, job security, production pressures, supervisory style and their reaction to social stressors at home and at work.

CONTROL OPTIONS

- Have a good climate of communication in the workplace.
- Encourage team work.
- Encourage the prompt reporting of hazards, with appropriate action taken.

I. PSYCHOLOGICAL CHARACTERISTICS OF THE WORKER

It has been suggested that some psychological characteristics may contribute to the development of discomfort at work, such as:

- a tendency to take on too much work;
- working through deadlines;

- being a competitive perfectionist;
- a tendency to be unaware of early warning signs of discomfort, or to ignore them;
- an inability to relax, or a poorly developed ability to sense the state of one's muscles.

However, there is little research to support or refute the hypotheses on psychological risk factors. Note too that people with these characteristics may be the most valuable employees.

CONTROL OPTIONS

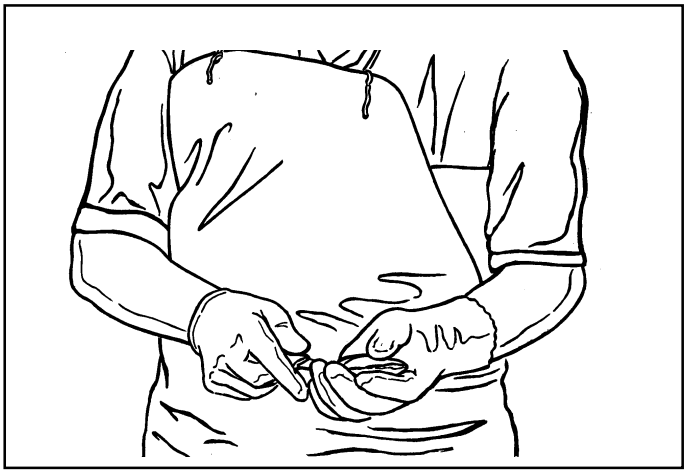
- Recognise the above characteristics during work and discuss with the employee.
- Assess workers during orientation induction.
- Provide training on prevention of OOS.
- Ensure breaks are taken regularly.

J. BEHAVIOURAL CHARACTERISTICS OF THE WORKER

This term refers to the way people hold and move their hands and limbs to do their work. Sometimes, actions are forced on people by the design of the equipment they are using, and its design will need alteration.

The following actions, particularly if carried on for some time, are likely to lead to discomfort and pain:

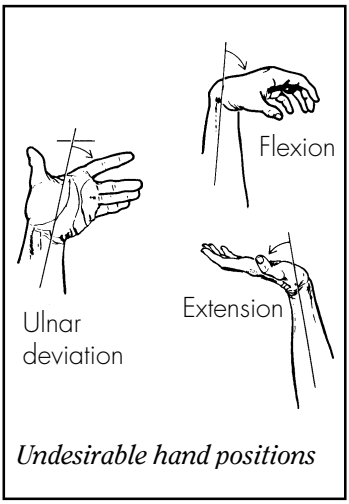
- Prolonged abnormal postures of the back, neck, shoulders or arms, e.g. excessive forward



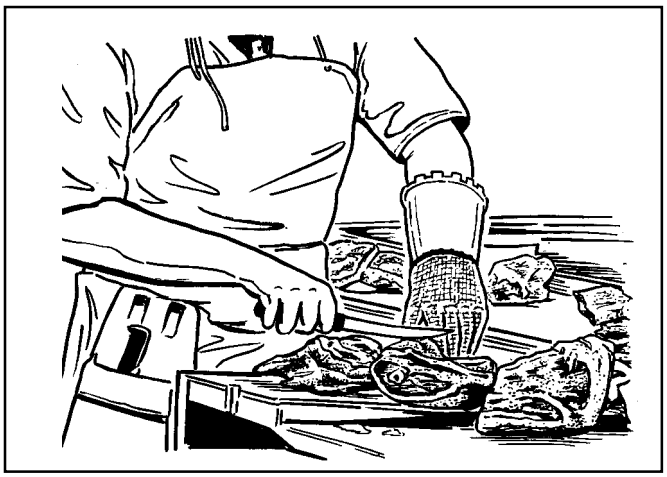
Train workers in using balanced, relaxed postures.

bending and forearms bent away from midline position.

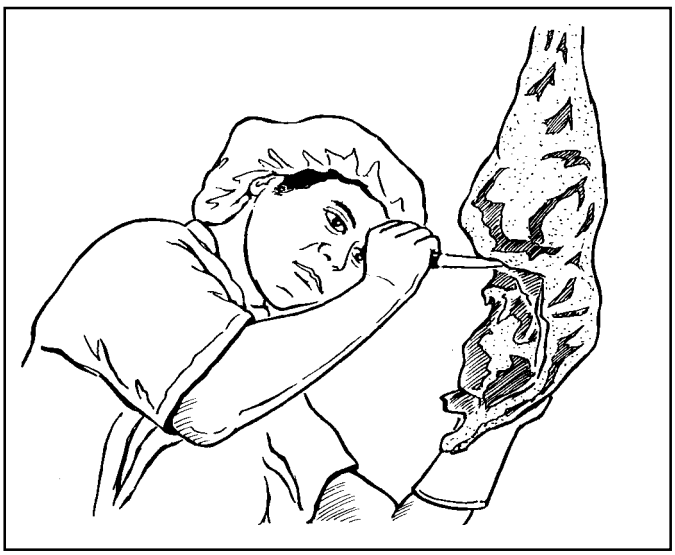
- Wrist extension, if excessive, particularly if sharp movements or force are involved (see Appendix I).
- Excessive ulnar deviation (sideways bending of the hand towards the little finger) both in movement or during sustained holding.
- Repetitive pronation-supination (turning of the forearm so the palm of the hand faces up, then down).
- Overspanning (spreading the fingers out wide to grip objects).
- Excessive force in squeezing movements.
- Using pinch grips rather than power grips.
- Shock-loading to the hand, wrist and arm from using a hammer, or by tugging, jerking or sharp torque reactions.
- Repetitive picking up with the hands.
- Pressure placed on the hand by tool handles.
- Lifting heavy objects.



Undesirable hand positions


Provide information and training in safe knife handling.

- Analyse work positions, in consultation with workers.
- Provide the results of analysis to supervisors or managers for change.
- Train workers and supervisors to:
  - adopt balanced, relaxed postures;
  - use good working techniques;
  - use micropauses, let the body relax;
  - have relaxed muscles generally.
- Provide time for:
  - adjusting the workstation properly;
  - doing exercises;
  - taking breaks;
  - stretching and limbering.
- Provide training in knife handling.
- Provide manual handling training. Ensure there is as little manual movement of the product as possible, especially if it is over 20 kg.
- Analyse the way tools and equipment are used (especially in high-risk areas, such as fish filleting and boning). Trial new equipment for suitability of use.



Force required to hold the knife while cutting fat and skin is one of the hazards in processing.

- Train workers how to use tools correctly and ensure time is given during orientation for them to come up to speed gradually.

(Note the overlap with other types of risk factor listed under Subsection I: Psychological Characteristics).

K. OOS HAZARDS THAT RESULT FROM THE NATURE OF THE PRODUCT

In the processing of red meat, chicken, fish and shellfish, the texture of the meat varies greatly, as does the state in which it is cut. For example, fish may be semi-thawed and mussel shells are steamed to open them. Red meat may be chilled or warm, depending on the type of meat it is. Hence, the equipment required to open or cut the product varies as well. Some of the hazards in processing are:

- The effort required in handling heavy, awkward carcasses, or blocks of frozen or thawing fish.
- The force required to hold the knife while cutting fat and skin around meat.
- The grip required when opening shellfish.
- The force required to hold the product.
- Wet conditions, making the product slippery.

CONTROL OPTIONS

- Suspend heavy meat carcasses or joints.
- Provide training in correct ways to handle carcasses and large pieces of meat.
- Provide suitable knives for the different textures of meat.
- Ensure regular sharpening of knives, and maintenance of sharpening equipment.
- Regulate speed of process line so that excessive demands are not placed on the workers.
- Provide training in specific specialty jobs, and allow workers time to build up to speed.
- Control the temperature of the product, for ease of cutting.
- Ensure that gloves are appropriate for the task.

L. OTHER ENVIRONMENTAL HAZARDS

Other hazards in the workplace environment include:

- Poor housekeeping, e.g. meat offcuts and fat on floors.
- Standing on cold, wet concrete floors— this may increase muscle tension in the legs and back.
- Wearing uncomfortable gumboots.

(Many other workplace hazards which are not direct causes of discomfort or injury, such as in-running nips on conveyor belts, could also be mentioned here.)

CONTROL OPTIONS

- Sweep and wash the floors at regular intervals to avoid slipping hazards.
- Remove offcuts of product regularly.
- Provide insulating nonslip footwear.
- Provide anti-fatigue mats where possible.

SECTION 5 INFORMATION AND TRAINING FOR ALL IN THE WORKPLACE

INTRODUCTION

The HSE Act requires employers to provide employees with information and training in a form that they can readily understand. This section covers the content of information and training required for the prevention of OOS in the food processing industries.

A. WHAT'S MEANT BY INFORMATION AND TRAINING?

Giving information is simply passing on verbal or written material. The Health and Safety in Employment Act 1992 requires information to be given to employees concerning the hazards identified in the plant and the measures taken to counter them.

By itself, information has a very limited role in ensuring the safe use of knives or discomfort-free work. What counts is that employees 'behave safely'. In particular, this means that they 'use their bodies' in ways that are safe — and this needs time, opportunity and skilled coaching with feedback.

Training is where a trainer coaches a person in ways of doing things, in this case carrying out physical actions, while monitoring the development of skill in the desired actions.

The main health and safety problems that information and training must address are the prevention of knife cuts and muscular discomfort, since the latter can develop into occupational overuse syndrome (OOS). Employees need to know why and how muscular discomfort (and in the extreme case, OOS) can occur. This will lay a foundation for the training they receive.

B. TRAINING

Training should recognise the immense skill needed to do most of the tasks in the food processing industry effectively. There are no Olympic or Commonwealth Games events called the 'Boning Marathon' or the '200 Oyster Shucking'. Yet the skill and proficiency of many a New Zealand worker equals that of an Olympic medallist.

The aim of training for skill development is to promote rhythm and relaxation in the way physical actions are performed. Relaxed, skilled performance looks attractive and effortless and has its basis in the adoption of appropriate postures, rhythmical actions and safe working techniques. As for all athletes, warm-up exercises should be performed before the 'event'.

For an employer, the time and effort invested in training will be repaid in the long term as tasks are done more *efficiently*, leading to greater production; more *effectively*, leading to higher quality production; and more *safely*, leading to fewer injuries and less discomfort.

Stretching frequently allows muscles to rejuvenate.

Aspects of the way people use their bodies are addressed below under C. Five topics are discussed separately but it's the net effect of their application that counts — how these points are integrated into the performance of a particular task. This is a major challenge for trainers.

C. SAMPLE INFORMATION ABOUT OOS FOR EMPLOYEES

Employees need simple information about the reasons for workplace discomfort so that they can appreciate why the various preventive suggestions are made. The muscle tension explanation for OOS can be used to illustrate its causes. These causes can be presented in two ways: (a) in terms of what people do and then (b) in terms of why people do those things. (See table 2, page 9).

Why we can get discomfort because of work

The basic cause of workplace discomfort is that muscles are held tense for too long. The idea of repetitive movements is misleading. When we make repetitive movements (typing, knitting or working with knives for example) some muscles (especially the ones on the top of the forearm) remain tense all the time. It's usually these muscles that get the problem.

The reason discomfort develops is like this:

Muscles and tendons receive blood through very fine vessels passing between the muscle fibres. A tense muscle squeezes on these vessels and they collapse, slowing the flow of blood.

When blood flow slows enough or stops, the muscle may switch to a form of working which is very inefficient. This uses up the energy store in the muscle very quickly and leads to a build-up of acid wastes in the muscle (lactic acid). This is what causes the discomfort and pain.

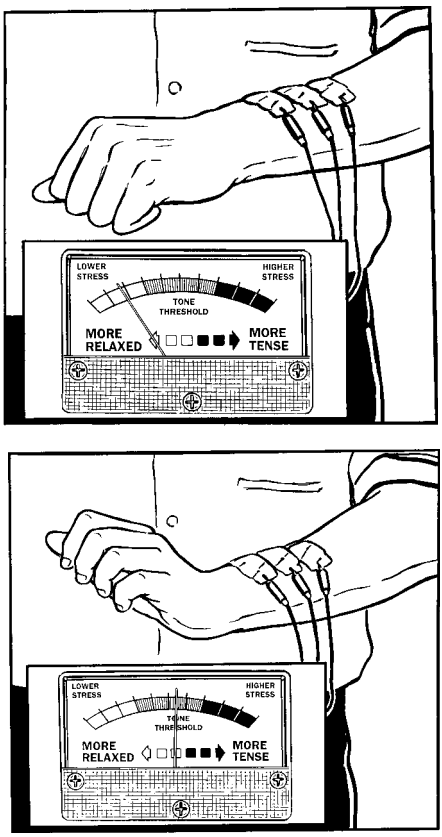
Initially, this discomfort is normal fatigue. Muscles and tendons are able to resist fatigue and they will recover quickly if they can relax between contractions. Regular rest breaks, including micropauses (see page 45), and/or a variety of tasks are needed to prevent the tensing of muscles and tendons beyond their limit for recovery.

Muscle pain can make the neighbouring muscles come out tense in sympathy by a reflex action (the socalled 'splinting reaction'). This is a normal reaction to injury and is good where bracing is needed for acute injuries like a broken bone.

In chronic pain, however, a self-sustaining cycle of tension can occur. In the beginning, this discomfort is normal fatigue. Muscles (and tendons) are able to resist fatigue and they will recover quickly if they can relax between contractions. Regular rest breaks (including micropauses) and/or a variety of tasks are needed to prevent the tensing of muscles and tendons beyond their limit for recovery.

If the nerves don't get enough blood, other problems may occur. Just as a tense muscle may deny itself blood, so it may cause nerves to get cut off from a proper supply as well. Tense muscles may squeeze on nerves, causing numbness and tingling.

This simple explanation may be all that's needed to explain the feelings that people with this particular type of discomfort often get.



The use of the electromyograph to measure muscle tension is shown in the video.

So, the basic cause of these problems is:

Muscle tension x time.

Therefore, reducing tension by relaxing muscles and reducing the length of time for which tension is held — and giving muscles time to recover between contractions — are the keys to avoiding both short-term discomfort and long-term problems.

Relaxing — keeping muscle tension to a minimum — comes in a number of guises:

- Holding a relaxed posture.
- Knowing what relaxation feels like — and applying it.
- Doing exercises.
- Using micropauses.
- Employing rhythm in the way tasks are done.
- Using safe working technique and skilled actions.

All of these are covered in the next section and more fully in the appendices.

D. PERSONAL FACTORS: THE WAY PEOPLE USE THEIR BODIES

Much of this guide is concerned with designing and organising work so that people can do it with the least strain. This is called 'fitting the task to the person'.

Training — or 'fitting the person to the task' — is another consideration. In this context it's reasonable to expect that people who have knowledge about these matters and put this knowledge into practice will be more protected against discomfort.

POSTURE

Postures that avoid the need for muscles to be tense for long periods are a needed foundation for the healthy and safe performance of tasks.

The elements of good posture are the foundation for workplace design, so if the workstation design is poor, then good posture may be impossible. But poor workplace design is not the only reason for poor

postures. Habits built up over time can contribute. It may simply be that a person does not realise that they have a poor posture. This lack of realisation may stem from an inability to sense the state of the muscles or body parts. If this is the case, video filming and playback can play an important role in training.

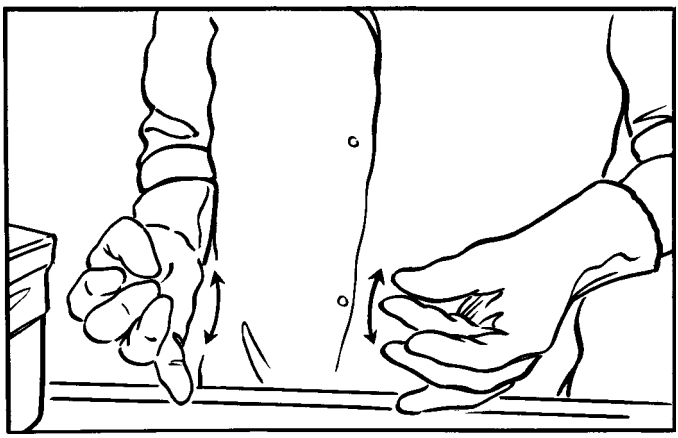
Features of safe postures all follow from the criterion that muscles not be held tight and tense for long periods. They are listed in Appendix G, which may be copied and distributed during training.

RELAXATION

Relaxation means the *absence* of tension in a muscle, above the natural resting amount. Relaxation is not 'doing something', it is rather 'stopping doing anything'. (Perhaps it isn't hard to see why relaxation does not come naturally to many people). A parallel to muscles stopping being tense is that thoughts also stop. This is, hopefully, impossible for most people, so it is helpful to say that 'our involvement with our thoughts' reduces to a minimum.

Having relaxed muscles while performing tasks is an essential skill. This is not to say that tasks should be performed half-heartedly, or in a floppy sort of way, but that the minimum tension necessary in each muscle is used to perform each element of a task, and that muscles that are not involved in the task are as relaxed as possible.

Watch a relaxed person in your workplace to see how they hold their body.



Warm-up exercises appropriate to the task should be carried out in a relaxed manner before starting work.

Relaxation does not come naturally, but there are good ways to learn it. They all involve feedback — immediate information on the state of the muscle.

EXERCISES

Three types of exercises are useful at work.

Warm-up exercises

Stretching warm-up exercises, appropriate to the task, should be carried out before work starts. Stretching is carried out most safely after warm up, so some kind of aerobic exercise is advisable beforehand, even if it involves no more than walking up several flights of stairs.

Traditional exercises of this nature are available from many sources.

Exercises to promote blood flow

These are useful when muscles have been held tight and tense for long periods.

Exercises to lengthen tight muscles

When muscles have been held tight and tense for some time they may also be shortened. Gentle lengthening exercises are then useful.

Exercises are demonstrated in the video and described in Appendix F, which may be copied and distributed during training sessions.

MICROPAUSES

Micropauses are brief breaks in work that allow muscles to relax and refresh their blood supply.

Physiological research has shown that after several minutes' tension, a muscle can be completely refreshed if it relaxes for just a few seconds. When tension is held for a period approaching an hour, several hours are required before the muscle returns to normal.

Opportunities to take micropauses can be found in almost any task. They should be taken frequently (every three minutes at least, for 10 seconds) and a conscious endeavour should be made to relax the muscle during the pause. This means stopping holding a knife. With time, and as skill develops, the need for conscious effort will lessen.

RHYTHM

Rhythm is built into performance when muscles alternate in their contractions to carry out tasks in an attractive, fluid manner. Rhythm takes on a life of its own and supports action. It removes the need to concentrate on each element of a task so that concentration can focus on the important or dangerous elements, such as using a knife safely.

Apart from skilled movements, rhythm also means an alternation of action and rest. Taking breaks regularly, such as 10-minute breaks every hour where strenuous or repetitious work is performed, and frequent micropauses taken every three minutes or so between tasks or parts of tasks, should reduce discomfort and can be expected to increase productivity.

Note that 'rhythm' is different from 'beat'. Rhythm is flexible and accommodates variation whereas 'beat' requires conformance to a set cycle — the very opposite of rhythm. Machine-paced tasks, each with their own 'beat', are more demanding than rhythmical tasks.

Like relaxation, rhythm is not something that can be 'taught', but it can be acquired.

WORKING TECHNIQUE AND SKILL

The term 'working technique' refers to factors such as:

- The way joints are held while tasks are performed;
- The way motions and movements are performed to accomplish tasks.

Working technique is explained more fully in Section 4.

Skill is when:

- The muscles required for the action or task operate effectively and economically; and
- No other muscles do unnecessary work.

Skill is thus a process of forgetting as well as learning — discarding the unneeded movements as well as developing the needed ones.

Skill is a notable feature of work in the food processing industry. Skill is evident in the fluid, seemingly effortless movements that experienced people make.

People new to a job often betray this fact by the many unneeded movements they make. This is neither good nor bad — time, practice and a climate of encouragement will allow their skill to increase.

Research has shown that skill can always improve — there's always a new skill level to go on to.

E. ACCIDENT REPORTING

Training in this area involves informing employees of their obligations to point out hazards, and to report aches and pains to their supervisor. The sooner accidents and incidents are reported, the sooner action can be taken to rectify any problems. (See Section 5d.)

F. LIFESTYLE FACTORS

What we do in our personal lives has an effect on how we carry out our work. Exercise provides increased muscle tone, improves energy levels and enables the body to better tolerate the demands of physical work. It's therefore beneficial to prepare for the tasks involved in employment, just as one would prepare for recreational pursuits. Preparation for a 10-km run, for example, would involve warming up and stretching the muscles to be used before starting the run. Diet complements exercise by providing the necessary nutrients to keep the body functioning.

Skill is a feature of all facets of work in the food processing industry.

FITNESS

The movements carried out at work tend to be repeated. This means that muscles lack variety in the way they move. (In some cases, this lack can be extreme.) Exercises that give muscles a variety of movement over their full range of contraction are necessary to offset this.

DIET

Carbohydrates and a variety of other foods such as vegetables and fruit provide the energy needed to carry out heavy manual tasks.

Complex carbohydrates include all types of bread, cereals (both hot and cold) and grain products.

These food sources also promote attentiveness while carrying out repetitious tasks that require heavy physical exertion, and sustained or repeated muscle activity.

The emphasis in this guide is on occupationally related disorders. However, other activities outside the workplace that require intense, sustained or constrained postures may contribute to overuse syndrome as well.

SECTION 6

MANAGEMENT OF OOS PROBLEMS WHEN THEY OCCUR

INTRODUCTION

Management must be prepared to deal with OOS problems if they do occur in the workplace. The first prerequisite is that senior management recognise the problem. Second is that they have the commitment to make the needed changes in work tasks, work organisation, workstation design, and so on.

That commitment needs to be supported by policies and procedures that promote the actions necessary to discharge that commitment.

A. MANAGEMENT COMMITMENT

Essential elements of commitment are:

- A dedication to identifying, assessing and controlling hazards relating to OOS.
- Attention to design of plant and equipment design, work schedules, process and flow.
- Attention to environment considerations, i.e. space, lighting, heat, cold.
- Having relevant managers/supervisors/ health and safety personnel trained in the prevention of OOS.
- A willingness to work in collaboration with employees, union representatives, ACC and OSH officers.
- Budgetary provision for safety and health.

B. POLICY DEVELOPMENT

A health and safety policy on OOS is best developed in collaboration with workers and their representatives and would include:

- A general statement of commitment to the prevention and control of OOS.
- An expectation of staff commitment to follow the policy.
- Provision for the employment of temporary staff if staff have to go off work, or duties need to be changed.
- Rehabilitation aspects included, such as early return to work guide.

The policy must be signed by the general manager or their representative. (See Appendix B.)

C. OOS REPORTING SYSTEM

To effectively manage OOS, there must be an early reporting system in place. This means:

- Training for all to recognise OOS symptoms.
- A delegated person responsible for taking action once symptoms have been reported.
- Assessment of job tasks in relation to symptoms.
- Provision of alternate duties.
- Liaison with medical staff to effectively manage time off work.
- Referral for correct diagnosis of symptoms.

There must be a health and safety culture within the workplace, with all staff working towards the goal of zero work-related injuries.

D. MANAGEMENT OF EARLY SIGNS AND SYMPTOMS

It is preferred that the employee remain at work. However, this will depend on the severity of his/her symptoms, alterations to the workplace and the availability of alternative duties.

Immediately it's known that a person has symptoms, an analysis of the work organisation, the design of the workstation, and the person's working technique should be carried out. This needs to occur, along with an analysis of the symptoms and how they present.

It may be necessary to have a formal diagnosis at this stage to determine what actions may have lead to the discomfort.

It may be useful to consult a doctor with occupational health experience. An ergonomist, an occupational therapist or other relevant practitioners may be called in to give advice on the formal assessment of tasks, using techniques already described in Section 4.

Alternative duties (see Appendix J) can be provided if:

(a) The doctor diagnosing has agreed that the person can stay at work without further injuring themselves; and

(b) The alternative duties do not aggravate any symptoms or bring on any other symptoms.

E. REHABILITATION

Rehabilitation/injury management is a process to restore the person with OOS to the fullest, physical, psychological, social, vocational and economic usefulness possible. It's a process that depends on the active co-operation and support of all parties concerned.

Basic principles in the management of an effective rehabilitation programme are as follows:

- Immediate action should be taken in dealing with reported injuries.
- An early start to treatment provides more chances for the worker to be actively involved in the whole rehabilitation process, which in turn allows the person to feel valued and able to contribute to his/her recovery.
- Ensure the person affected is able to understand the nature of their problem and its contributing factors. Simplify information/explanation to avoid the process being too complex to understand.
- Encourage an appropriate early return to work. This will help to maintain the worker's physical, mental and emotional wellbeing.
- If a worker has been off for over a month, it's advisable to have them tested for ability to carry

out tasks. Rehabilitation or physiotherapy centres carry out these tests. They will set up the tests to simulate work as much as possible and put the person through a number of tasks and monitor their body's physical reaction.

- Ensure regular communication is maintained between everyone involved in the rehabilitation process, including the person affected.
- Ensure that everyone involved in the process has the same outcome expectations.

Important points to note when reintroducing a person to work are:

- The injured operator needs to be involved in planning for return to work duties.
- The person should be aware that their physical muscular strength and ability to perform the task may have altered, so it's vital they return to normal work pace gradually.
- Duties should be modified to adapt to the person's capabilities.
- Others in the workplace need to recognise these factors and support their return to work.

This is discussed in more depth in Appendix J.

APPENDIX A COST FACTORS IN OOS

The costs to a company of work-related accidents and ill-health are often poorly appreciated.

Apart from the direct costs of an accident, or in this case, of a person having to leave work because of severe musculoskeletal pain, the associated indirect costs can be very large.

Typical costs that might be incurred by a company are as follows:

DIRECT COSTS

- Possible ACC experience rating penalty, lasting up to five years;
- Medical treatment;
- Sick leave;
- Wage top up for staff on ACC;
- Possible court fines and legal fees;
- Costs of the redesign of workstations and equipment;
- Costs of specialist equipment e.g. supports, splints.

INDIRECT COSTS

- Loss of productivity;
- Loss of skilled staff;
- Cost of hiring new staff to replace injured staff;
- Cost of training new staff;
- Loss of quality as new workers are trained;
- Additional supervision of new workers;
- Time spent investigating the incident;
- Effects of loss of morale;
- Possible personal grievance claims;

- Loss of reputation;
- Loss of market share: loss of product orders.

INDIRECT COSTS EXCEED DIRECT COSTS

There is a range of estimates for the ratio between the direct and indirect costs of an accident/incident. Typically a factor of between 4 and 8 is used. This means that for every dollar spent on the direct cost, between $4 and $8 will also be spent in some way.

If a profit margin of 10% is used, then the additional activity by a company needed to recoup these costs is as follows:

Direct cost of incident	$500
Indirect cost of incident	$2000 - $4000
Total cost	$2500 - $4500
Additional turnover required to offset these costs	$25,000 -$45,000

These are all costs to the company. Not included are the costs incurred by the person affected, ACC or by the public health system.

COSTS TO THE PERSON INJURED OR OFF WORK

- Possible home help;
- Medical costs;
- Rehabilitation costs;
- Loss of income;
- Pain and suffering;
- Effect on home life, hobbies and lifestyle;
- Effect on other family members;
- Travel to and from treatment providers.

APPENDIX B HEALTH AND SAFETY POLICY

INTRODUCTION

The standard components of a health and safety policy are detailed below, with some additional aspects that are particular to occupational overuse syndrome.

A. HEALTH AND SAFETY POLICY

- The policy needs to be written down.
- The policy should be distributed to all staff.
- The policy needs to be supported by other actions (described below) and financial considerations taken into account.
- The policy should be reviewed regularly, to determine that it is both working and feasible.
- Channels for action need to be established.

B. GOALS AND RESPONSIBILITIES

- Information on health and safety performance should be collected.
- The health and safety policy should address the current strengths and weaknesses of past and current performances.
- Goals for health and safety need to be reviewed periodically.
- Job descriptions should describe responsibilities for health and safety.
- Required roles need to be described and criteria for performance stated. The performance assessment should consider health and safety performance.
- There needs to be a mentor for health and safety, and regular contacts with other health and safety personnel.

C. OOS POLICY

An OOS policy should cover:

- The inclusion of ergonomic criteria in the design of equipment and work.
- The assessment of jobs, tasks and equipment to identify and assess hazards.
- Provision of information to staff.
- Training for staff.
- Provision for coping with changes in workload due to sudden jobs/orders, seasonal work, people away from work unexpectedly, machine breakdowns, etc.
- Early reporting of symptoms, and further reporting procedures.
- Development of a rehabilitation plan.
- Identification of suitable alternative duties.
- How workers and their representatives will be involved.

APPENDIX C

WORKSTATION DESIGN CHECKLIST

There are many examples of workstation design checklists based on ergonomic principles. The following* is one of the best-known and lists the basic principles of design for workstations and equipment:

1. The worker should be able to adopt an upright and forward-facing posture.
2. Where vision is a requirement of the task, the necessary work points should be visible with the head and trunk upright, or just with the head inclined slightly forward.
3. All the work activities should permit the worker to adopt several different — but equally healthy and safe— postures without reducing their capability to do the work.
4. Work should be arranged so that it can be done, at the worker's choice, in either a seated or a standing position. When seated, the worker should be able to use the backrest of the chair, at will, without necessitating a change of movements.
5. The weight of the body, when standing, should be carried equally on both feet, and foot pedals should be designed accordingly.
6. Work should not be performed consistently at or above the level of the heart. Where light hand work above the heart must be performed, rests for the upper arms are a requirement.
7. Work activities should be performed with the joints at about the midpoints of their range of motion.
8. Where muscular force must be exerted, it should be by the largest appropriate muscle group available, and in a direction co-linear with the limbs concerned.

---

*See *The Ergonomics of Workspaces and Machines*. 2nd Edition. Clark T S and Corlett E N, Taylor and Francis, London, 1995.

9. Where a force has to be exerted repeatedly, it should be possible to exert it with either of the arms, or either of the legs, without undue force.

NOTE

This checklist describes the 'shape' of the body as it should be positioned at the workstation. From this and anthropometric data (see Appendix D) the size of the workstation can be estimated.

These two starting points lead to an initial workstation design which serve as a basis for a trial. Results from such a trial can then be used to refine the design. Sometimes several rounds of trial/redesign are required before a workstation will cater for the acceptable percentage of users.

OSH has published a fuller set of checklists for the analysis of management systems and workplace design to prevent OOS (see Bibliography).

APPENDIX D

ANTHROPOMETRIC ESTIMATES FOR NEW ZEALANDERS

The data in this appendix are given as a guide only. They can be used to obtain some initial measurement for the dimensions of workstations but they can never, used alone, define what will be convenient for a large range of users.

Some of the data will indicate the minimum distances required between parts of workstations for body clearance (6 below), or for reaching to objects in front of the body.

Some useful rules of thumb:

1. Bench height. Set the bench at standing elbow height less about 50mm. The exact height will depend on the type of work to be done and the height of the item being worked on. Precision work needs to be higher, for example, but not so high to cause people to work with raised shoulders.
2. Add an appropriate amount for shoes — for men, 25mm, and women 45mm — but depending on the situation and the type of footwear worn.
3. Knuckle height is a useful reference point for the height of handgrips and support rails.
4. Finger height is a useful reference point for the minimum height of controls.
5. Thigh thickness is a useful minimum distance for the clearance between seats and the undersides of desks or workstations.
6. Buttock-knee length is a useful reference for the clearance between a chair back and any vertical sides of a workstation or desk that are an obstacle for the knee.

One valuable aspect of the table is that it demonstrates just how much short and tall people vary in their dimensions, and the consequent variability that may need to be built into a workstation.

ANTHROPOMETRIC ESTIMATES FOR NEW ZEALANDERS

		Males 19-45 yrs			Males 45-65 yrs		
Body Dimension		**5th**	**50th**	**95th**	**5th**	**50th**	**95th**
1	Stature	1665	1770	1870	1650	1745	1840
2	Eye height	1560	1660	1760	1545	1635	1730
3	Shoulder height	1355	1455	1550	1340	1430	1525
4	Elbow height	1035	1115	1190	1025	1095	1165
5	Hip height	865	940	1010	855	925	995
6	Knuckle height	710	770	830	700	760	815
7	Fingertip height	605	670	725	605	660	715
8	Sitting height	875	930	975	860	915	960
9	Sitting eye height	755	805	855	745	790	840
10	Sitting shoulder height	555	605	655	550	595	640
11	Sitting elbow height	200	250	295	195	245	290
12	Thigh thickness	140	160	185	140	160	185
13	Buttock-knee length	555	605	650	555	595	640
14	Buttock-popliteal length	455	500	555	450	495	545
15	Knee height	505	555	605	500	550	595
16	Popliteal height	405	450	490	400	440	480
17	Shoulder breadth	430	470	515	425	465	505
18	Hip breadth	315	360	405	320	365	405
19	Chest depth	205	245	275	230	265	295
20	Abdominal depth	215	260	300	235	290	340

		Females 19-45 yrs			Females 45-65 yrs		
		5th	**50th**	**95th**	**5th**	**50th**	**95th**
1	Stature	1555	1650	1750	1525	1630	1765
2	Eye height	1450	1550	1650	1425	1530	1635
3	Shoulder height	1255	1345	1440	1230	1330	1430
4	Elbow height	965	1035	1105	945	1020	1100
5	Hip height	765	835	905	750	885	895
6	Knuckle height	680	740	795	670	730	795
7	Fingertip height	580	640	705	565	635	695
8	Sitting height	820	875	935	800	865	920
9	Sitting eye height	710	760	815	695	750	810
10	Sitting shoulder height	525	570	620	510	560	615
11	Sitting elbow height	195	240	285	190	235	285
12	Thigh thickness	130	160	185	135	160	185
13	Buttock-knee length	535	585	620	530	585	635
14	Buttock-popliteal length	445	490	540	445	490	545
15	Knee height	470	510	555	460	505	555
16	Popliteal height	365	410	455	355	405	450
17	Shoulder breadth	365	405	445	355	400	440
18	Hip breadth	310	375	435	320	385	450
19	Chest depth	200	245	290	225	270	310
20	Abdominal depth	200	250	295	225	275	330

NOTE: there has never been a comprehensive survey of the sizes of the New Zealand population. These data are estimates based on measurements of British adults and the relation between their average stature and the average stature of the New Zealand population.

References

Size and Shape of New Zealanders. NZ Norms for Anthropometric Data. Wilson N, Russell D and Wilson B. Life in New Zealand Activity and Health Research Unit, University of Otago, 1993.

B*odyspace, Ergonomics, Anthropometry and Design*. 2nd Edition, Pheasant S T, Taylor and Francis, London, 1996.

APPENDIX E

SELF-REPORT OF DISCOMFORT

1. Name: _____

2. Age: _____

3. Are you:

Left-handed ☐

Right-handed ☐

4. Job title: _____

5. Length of time in present job: _____

6. Today's date:_____

7. Do you have discomfort now? Yes ☐ No ☐

If yes, please describe it:

_____

_____

_____

_____

8. When did you first notice any discomfort in this job?

_____

_____

9. Please describe the task that causes the most discomfort:

_____

_____

_____

_____

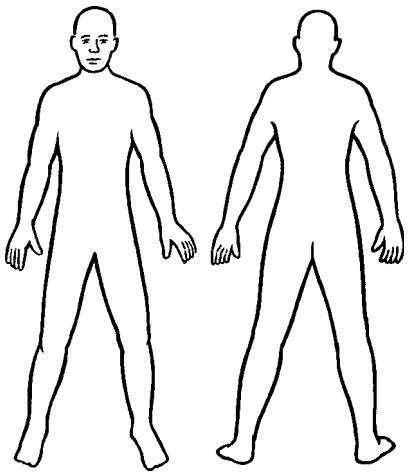
10. Please describe the tasks that are second most serious cause of discomfort:

_____

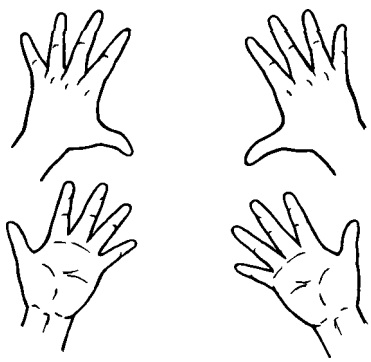
_____

_____

11. Please shade on the body diagram below where discomfort is occurring:



12. Please shade on the diagrams of your hands where any discomfort is occurring:



13. General comments:

_____

_____

_____

_____

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_____

_____

APPENDIX F

VIDEO AND EXERCISES

ABOUT THE VIDEO

The video accompanying this resource kit is a training tool aimed at workers. It covers the processing of red meat, poultry and fish (including shellfish) and gives guidance on what workers can do themselves to prevent OOS. It points out, however, that there's a limit to what employees can do, and that plant, equipment and workflow changes may be required.

The video gives a short explanation of why OOS occurs and gives tips on how to reduce the likelihood of injury by:

- using micropauses;
- sharpening the knife correctly;
- stretching and warming up muscles;
- holding the knife at a correct angle;
- performing specific exercises;
- understanding elements of the knife;
- adopting comfortable postures;
- standing close to workstations; and
- developing rhythm.

The video shows the use of an electromyograph (EMG), a device that measures muscle tension.

The video should be useful as part of an orientation procedure and as part of up-skilling, reminding workers of the areas where they can take responsibility.

The following pages give a summary of the exercises shown in the video, and can be copied and given to staff.

EXERCISES TO HELP AVOID OOS

The video *Muscle Minding,* which was produced specifically for people who work in the meat, poultry and fish processing industries, demonstrates some simple exercises that will help with the prevention of Occupational Overuse Syndrome (OOS). These exercises are explained and illustrated below.

When should these exercises be done? To get the maximum benefit, you should perform them at the start of your shift, during breaks and any other time you feel the need for them.

While performing the exercises, it's important to maintain a relaxed stance. Your legs should be roughly shoulder-width apart, your shoulders should be relaxed, and your hands should be at the side of the body to start with.

These exercises are all designed to promote blood flow and help lengthen tight forearm muscles.

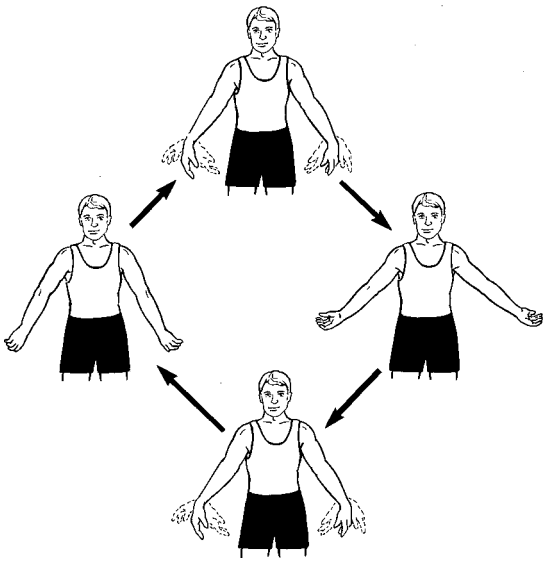
A. FOREARMS (40 SECONDS)

1. HAND FLAPS

With your arms loose at the side of the body, shake and flap your hands in a gentle and relaxed manner for 5 -10 seconds. Let your wrists go completely limp. Don't use any forearm muscles to do the exercise.

2. FOREARM TURNS

Hold your arms out a little from the body and slowly rotate each arm so that the palms face out and up, to stretch the upper inner forearm muscle. Hold for 5 seconds; making sure your fingers are loose. Now rotate fully in the reverse direction. Relax and flap hands again.



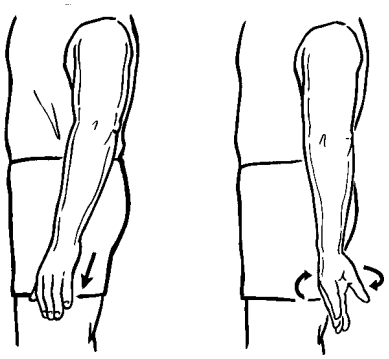
3. HAND FLAP

Repeat 1.

1

4. SECOND ARM TURN

Twist the wrist so palms turn inwards and backwards, to stretch the outside forearm muscle. Hold for 5 seconds. Rotate fully in the reverse direction. Relax and flap hands again.



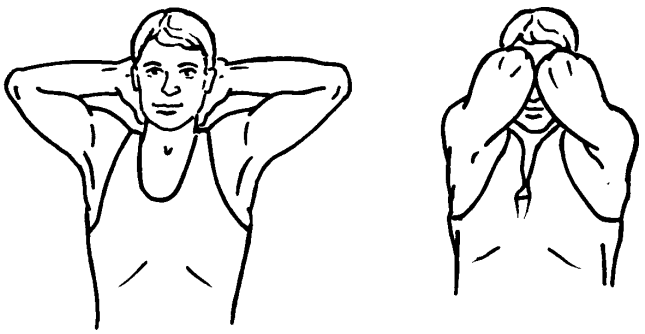
B. SHOULDERS

SHOULDER ROTATION (30 SECONDS)

Slowly rotate your shoulders forwards, upwards, backwards and then allow them to drop, completing a large circle, taking at least four seconds to perform this movement. Relax momentarily and then repeat the exercise one or two times. Now, do this exercise in the opposite direction.

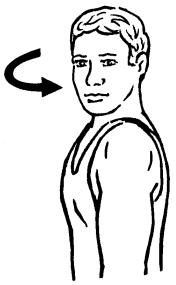
CHEST AND SHOULDER EXERCISES (ABOUT 20 SECONDS)

With your neck straight, clasp your hands behind your head and gently stretch your elbows back until your shoulder blades feel like they are close. Now stretch each elbow out sideways, and hold this for five seconds. Relax momentarily and then move the elbows forward and as close together as possible. Hold this for five seconds and relax.



C. HEAD

1. HEAD ROTATION (ABOUT 20 SECONDS)

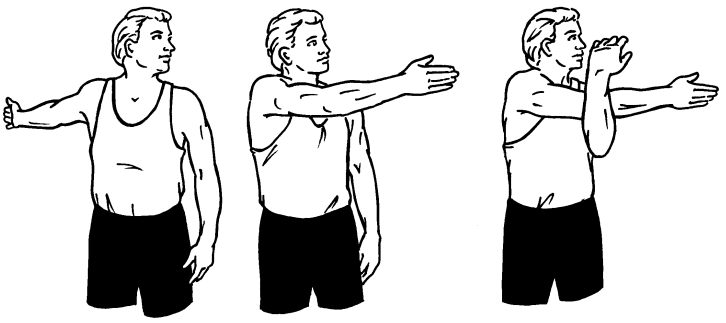


Turn your head slowly (keeping your chin in), look to your left side and then behind you, gently stretching at the end point. Hold for five seconds and return to the straight ahead position and relax. Imagine a point of light moving slowly around the room, and follow it with your eyes. Now, repeat the exercise to the right side.

2. HEAD SHRUG AND STRETCH (ABOUT 20 SECONDS)

Raise your shoulders as high as possible while tucking your chin in. Hold for five seconds, then relax and go into neck stretch. Drop your shoulders and hold them downward, while stretching your head upwards. Make sure your head is not tilted forward or backward during this exercise.

3. SHOULDER STRETCH



Start with your right arm stretched back as far as it will go. Look to the left and move the right arm horizontally across the front of the body until it points to the left. Place the left arm over the right elbow and pull backwards to fully stretch for five seconds. Relax momentarily and repeat on the opposite side.

APPENDIX G

SAFE BODY POSITIONS

Safe body positions are those positions where when muscles are not held tense for long periods. The following features of safe body positions all stem from the idea of reducing muscle tension to a minimum. The comments in italics refer to features of your workplace or to other reasons that may cause you to adopt an undesirable position.

Face straight on to your work

If your body turns constantly to one side then muscles on that side will be tense for long periods. *(Workstation places work to one side: working to one side rather than drawing the work to be in front).*

Stay upright

If your body constantly leans forward or leans over to one side, then the muscles in your lower back or your side will be tense for long periods. *(Workstation too low).*

Balance your head

If your head constantly tilts too far forward or back then the muscles at the top of your neck will be tense for long periods. There are safe ways to look down, such as rotating the head on the top of the neck rather than bending forward. *(Workstation too low or too high: workpiece too close to your body).*

Shoulders low and relaxed

If your shoulders are constantly raised, then the muscles on the sides of your neck/shoulders will be tense for long periods. *(Workstation too high: general tension is often expressed in raised shoulders).*

Elbows gently at your sides

If your elbows are constantly held out sideways, then the muscles on the top of your shoulders will be tense for long periods. *(Workstation too high).*

Work with your wrists straight

If your wrists are bent, it may be because your elbows are pushed out, or your workstation is too high or low.

Have good foot support

Make sure your feet are well supported. If they dangle, your leg muscles have to stay constantly tense to keep them in place.

Do some limbering movements from time to time

Do these to counter the effects of a static position. Once every hour or so is ideal.

APPENDIX H

KNIFE HANDLING

INTRODUCTION

This is a general section on knife safety, covering aspects of knife handling as they relate to OOS. It acknowledges the individual's expertise with boning, filleting, trimming, shucking, slicing and does not attempt to override that.

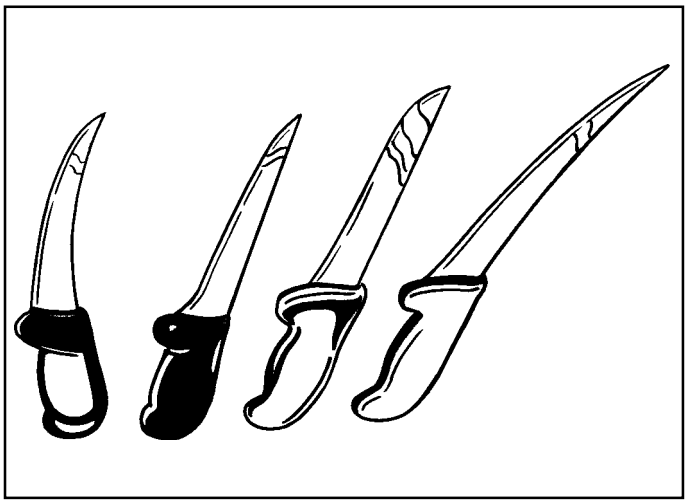
Knife choice, handling, sharpening and maintenance are key areas in the prevention of OOS in poultry, meat and fish processing. Injuries include (as well as cuts) wrist sprains and strains and these are due to repetition, force exerted and posture while carrying out their tasks.

One of the main problems experienced is the frequent bending and twisting of the wrist too far from the natural position, particularly when movements are fast and jerky.

WORKPLACE POLICY

Each workplace should have a policy in place that covers:

(a) Selection of the correct knife for the task, including considerations such as comfort, fit, handle diameter and material, and blade shape.



Selection of the correct knife for the task is important.

(b) Protective equipment to use with the knife, i.e. arm guard, scabbards, protective gloves, aprons, knife guards (including where and when to use this equipment).

(c) Training by a suitably qualified person on:

- sharpening techniques;
- steeling techniques;
- general handling of knives;
- working techniques.

(d) A supervisory position or a buddy system until the new worker is suitably trained.

(e) Storage of the knife, its cleaning and sanitation techniques.

SAFETY TIPS FOR WORKERS

Some extra safety tips for workers are:

- Never try to catch a falling knife.
- Keep your knife in the scabbard when not in use.
- Wash the knife in boiling water before stoning.
- Make sure the steel is fitted with a guard.
- Make sure you have been shown how to sharpen the knife before attempting it yourself.

KEY POINTS

There should be consultation between management, employees and safety and health representatives in the selection, trialling and training in the use of new knives.

Knives should be trialled for suitability in each different type of work or area, e.g. boning and slicing.

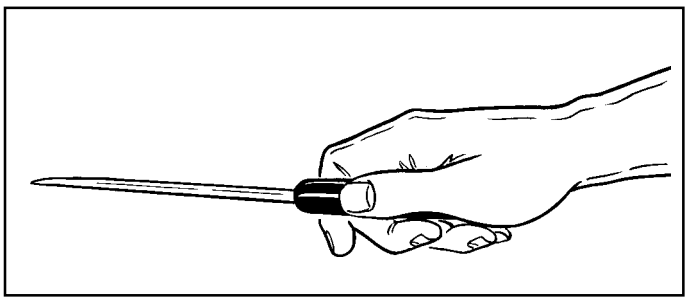
The handle needs to be large enough to provide a secure grip. This prevents the hand slipping forward over the blade (run through) and reduces the force required to hold the knife.

The handle design should reduce excessive wrist bending — the principle is to bend the tool, not the wrist.

The line of action of the tool should coincide with the line of the action of the wrist and forearm.

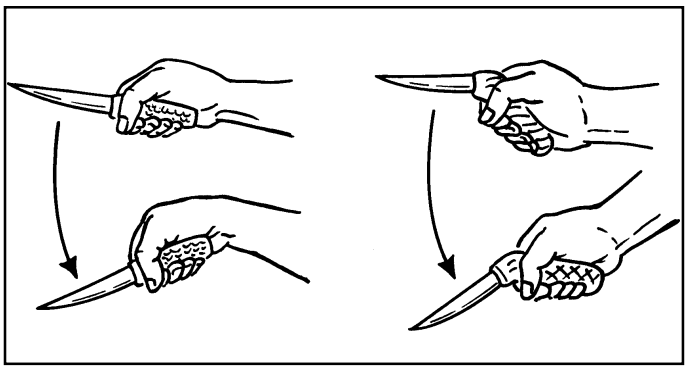
The knife should be gripped evenly along the surface of the handle.

Sharpness of the knife is essential in reducing the force required to make a cut. If the knife is blunt, more force is needed to cut and this increases the risk of overuse problems. Sufficient time should be provided for people to sharpen their knives.



Line of action of the knife should coincide with the line of action of the wrist and forearm.

Training in using a new knife is essential. Different methods may be required with different designs. The work rate may need to be lowered to allow a lead-in time from training.



Provide training in how to use knives and tools correctly.

Reference

For further information, see Meat Industry Generic Entry Level Unit Standard *Sharpen and Maintain Hand Knives in the Meat Processing Industry*, available from the New Zealand Qualifications Authority.

APPENDIX

WORKING TECHNIQUE

Safe working techniques all relate to the way muscles apply tension.

The way that joints are held while tasks are performed:

- Avoid marked bending up at the wrist, particularly if sharp movements or force are involved.
- Avoid excessive sideways wrist bending — during movement or in holding sustained hand positions.

The motions and movements used to accomplish tasks:

- Avoid repeated turning of the forearm (along its length).
- Avoid over-spanning — wide opening and gripping movements of the fingers.
- Don't apply excessive force in squeezing movements.
- Use a power grip (as when holding a hammer) rather than a pinch grip (as when holding a pencil).
- Avoid repeated shock loading to the hand, wrist and arm from the use of a hammer, or by tugging, jerking or from sharp torque reactions.
- Avoid repetitive picking up with the hands. (As when moving a pallet of paving blocks from the front gate to the back yard).

APPENDIX J

EXAMPLE OF A REHABILITATION PROGRAMME

Rehabilitation is a process to restore the person with OOS to the fullest physical, psychological, social, vocational and economic usefulness possible. As such, it depends on the active co-operation and support of all parties concerned.

An appropriate early return to work should be encouraged, with time off work limited to a minimum.

A. PRINCIPLES OF RETURN TO WORK PROGRAMMES

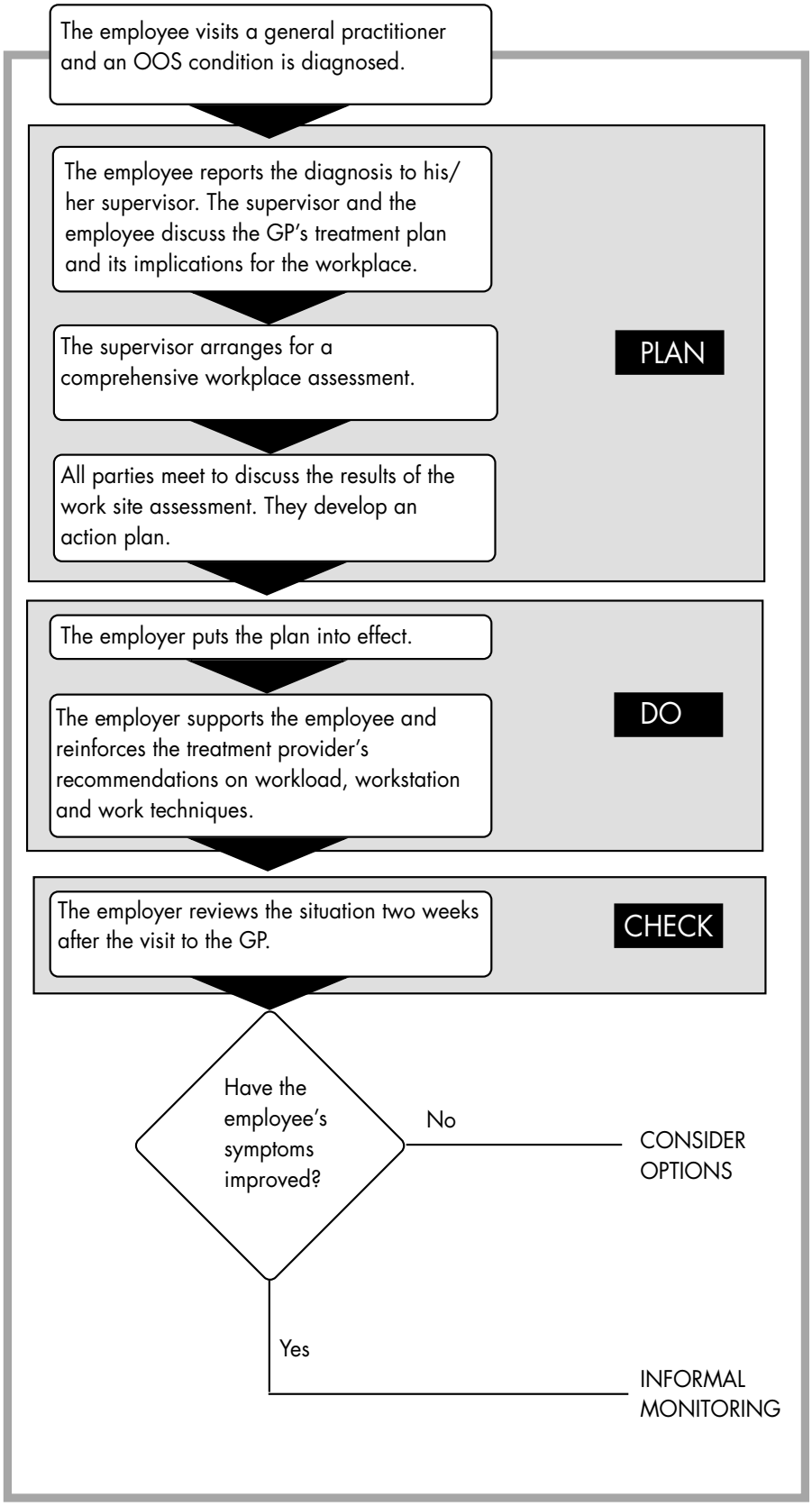
Return to work plans need to be arranged in advance so that the person returning can be dealt with promptly and effectively.

The following elements of a return to work programme will need to be considered:

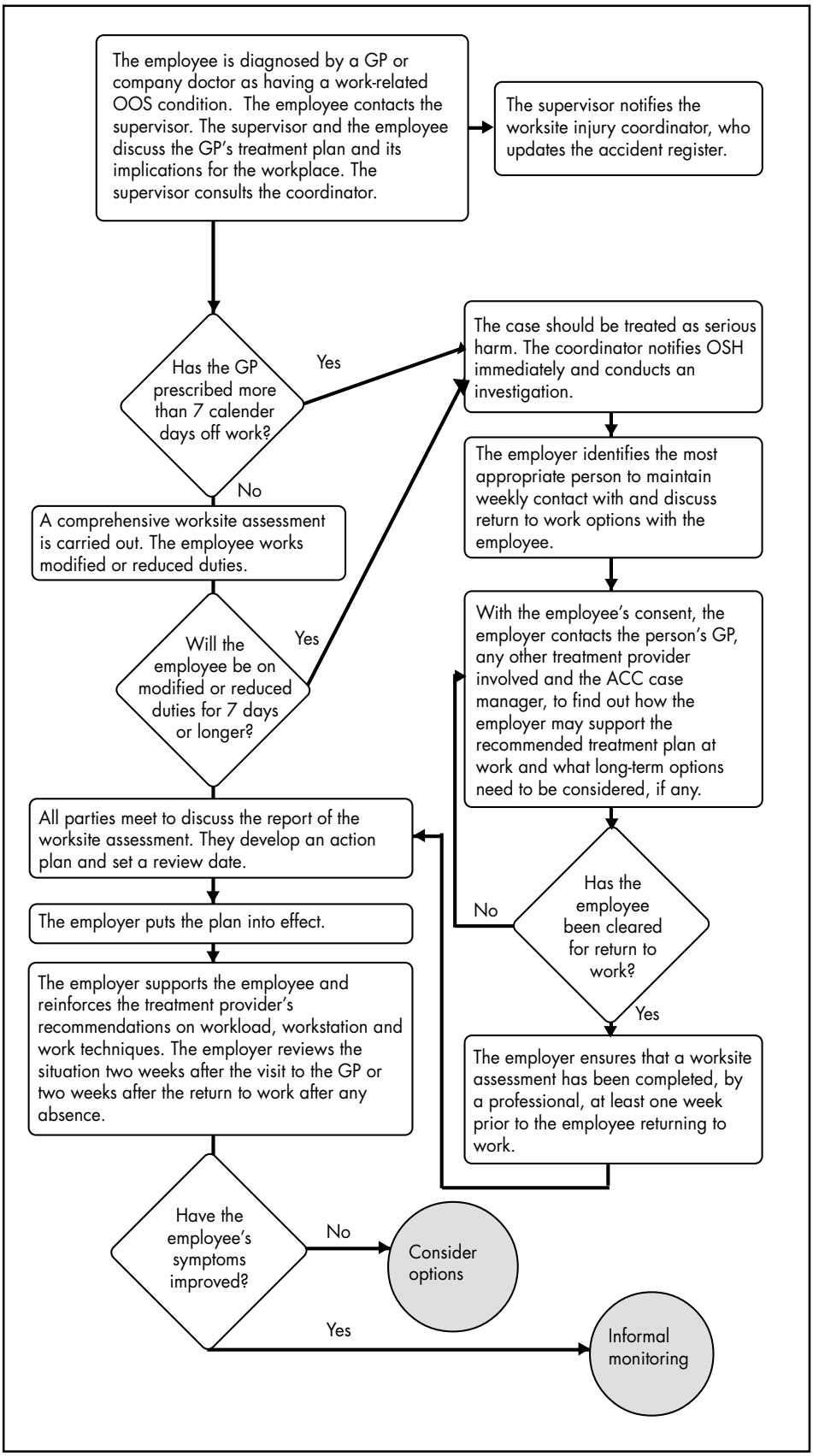
- The identification in advance of alternative duties.
- Communication between treatment providers and the employer.
- Contact with the person affected while he/she is away from work.
- A workplace assessment, followed by any indicated remedial action for the workplace design and for work practices.
- An assessment of the person's physical skills.
- The identification of any training the person might need.
- A gradual reintroduction to full work speed.
- Plans to review the effectiveness of the intervention.

A sample management outline for the resolution of difficult cases is presented in summary form overleaf.

MANAGEMENT OF THE RETURN TO WORK: BASED ON THE QUALITY CYCLE



MANAGEMENT OF THE RETURN TO WORK: DETAIL



B. REINTRODUCTION OF AN EMPLOYEE AFTER ABSENCE

A sample outline of a gradual reintroduction to work after absence due to OOS is shown below. This should not be regarded as a hard and fast procedure, but it does indicate the type of regime that may be needed.

C. PROCEDURES FOR REINTRODUCING AN EMPLOYEE AFTER AN ABSENCE

After time off work due to injury, an operator's muscles may feel completely recovered, but they will also have lost physical condition. It's essential for the person to work up to full production gradually. The following points should be observed:

1. An injured operator may have been losing speed for some time before going off work. Temporary staff should be used to clear away any backlog of work, and to avoid overloading the remaining operators in a section.
2. The injured operator should be invited back to work while still off work to discuss the probable contributing causes to injury. This should be done sufficiently early to implement changes before the operator returns to work.
3. The now-recovered operator should not work a full shift for the first four days. A suitable work schedule might be, after 1-2 weeks off work, as follows:

DAY 1:

Four sessions of work (if the employee has been off work for 2 weeks), or six sessions of work (if only 1 week off work) of 15 minutes. The employee's operating style should be monitored during these periods, and the adoption of relaxed work-styles made a necessary condition of return to work. Temporary staff can be retained to take the bulk of the workload. The operator is given a relaxing task or is sent walking for the intervening periods. At the end of Day 1, and every day after for 2 weeks, the

operator should be checked by the supervisor to see how he/she is faring.

DAY 2:

Six sessions (if the employee has been off work for 2 weeks), or 9 sessions (if only 1 week off work) of 15 minutes. The operating style should be monitored for at least half of these sessions, and relaxation again emphasised. As for Day 1, the periods when the operator is not at the work should be filled with a non-stressful task which does not involve heavy hand loads. For example, prolonged writing should be avoided, as should the use of heavy directories or over-full filing cabinets.

DAY 3:

Five sessions (if the employee has been off work for 2 weeks), or 7 sessions (if only 1 week off work) of 30 minutes. Monitoring and intervening tasks as before.

DAY 4:

Review progress in the morning. If there are signs of discomfort overnight, return to Day 1 and check for other contributing factors. Otherwise proceed with 6 sessions (if the employee has been off work for 2 weeks), or 7 sessions (if only 1 week off work) of 45 minutes.

DAY 5:

Seven sessions of 45 minutes (if the employee has been off work for 2 weeks), or 7 sessions of 50 minutes (if only 1 week off work).

Hence, full production must include some hourly break. It should be possible to introduce a 10-minute break, although this may take some organisation. The breaks do not have to be inactive, they only need to be different from the activities which place stress on the muscles during the main task.

D. ALTERNATIVE WORK DUTIES

When alternative work duties are assigned, care must be taken not to aggravate the prevailing symptoms by assigning the person to a task that requires the same posture and muscle group to be used.

Alternative duties should be discussed and evaluated by the health professional responsible for the person's rehabilitation before they are allocated a task. This allows the identification of potential hazards in each person's case. Failure to carry out this fundamental requirement may result in further harm occurring.

Employers, supervisors and the employees should follow the advice on work procedures or time frames set by the health professional in order to effect a full and speedy recovery. By the same token, health professionals should have knowledge of the conditions the employee works in.

Below is a list of alternative duties used by some organisations to provide work for persons diagnosed with OOS. Each case and task must be evaluated for individual suitability. These duties may not be suited to everybody, due to vibration, body positioning and manual strength required, and are suggestions only.

Duties

assembling cartons
specified parking
stock yards
amenity cleaning
general housekeeping
gardens and grounds
special projects
visitor guide
waterblasting
deliveries/pickups
rodent control
laboratory assistant
quality assurance manuals
filing.

APPENDIX K DEFINITION OF SERIOUS HARM

At the print time of this document, the definition of serious harm in the First Schedule to the Health and Safety in Employment Act is under review. There will be extensive consultation with interested parties, commencing from mid-1997.

Please note that the wording below is a proposal only at this stage, and is subject to change and approval by the Minister of Labour, following consultation.

In the meantime, the definition set out in the First Schedule to the HSE Act continues to apply.

If you have any comments to make, please direct them to the OSH Centre for National Support (for address, see page 83).

We intend to update this information as necessary.

PROPOSED AMENDED FIRST SCHEDULE (SERIOUS HARM) TO THE HEALTH AND SAFETY IN EMPLOYMENT ACT 1992.

1. Any of the following conditions that amounts to, or results in, permanent loss of bodily function, **or which are likely to render a person unable to carry out normal employment duties for seven (7) calendar days:** respiratory disease, noise-induced hearing loss, neurological disease, cancer, dermatological disease, communicable disease, musculoskeletal disease, illness caused by exposure to infected material, decompression sickness, poisoning, vision impairment, chemical or hot-metal burn of eye, penetrating wound of eye, bone fracture, laceration, crushing.

2. Amputation of body part.

3. Burns requiring referral to a specialist registered medical practitioner or specialist outpatient clinic.

4. Loss of consciousness from lack of oxygen.

5. Loss of consciousness, or acute illness requiring treatment by a registered medical practitioner, from the absorption, inhalation, or ingestion of any substance.

6. Any harm that causes the person to be hospitalised for a period of 48 hours or more, commencing within 7 days of the harm's occurrence.

BIBLIOGRAPHY

Legislation

Health and Safety in Employment Act 1992

Health and Safety in Employment Regulations 1995

OSH and ACC Publications

How to Identify and Control Hazards. Occupational Safety and Health Service, Department of Labour, Wellington, 1993.

How to Select an Occupational Safety and Health Consultant: A Guide for Managers. Accident Rehabilitation and Compensation Insurance Corporation, Wellington, 1966.

Manual Handling Guidelines for the Workplace. Occupational Safety and Health Service, Department of Labour, Wellington, 1991.

Occupational Overuse Syndrome: Checklists for the Evaluation of Work. Occupational Safety and Health Service, Department of Labour, Wellington, 1991.

Occupational Overuse Syndrome: Guidelines for Prevention and Management. Occupational Safety and Health Service, Department of Labour, 1991 (Reprinted 1995).

Occupational Overuse Syndrome: Treatment and Rehabilitation - A Practitioner's Guide. 2nd edition, ACC and Occupational Safety and Health Service, Department of Labour, Wellington, 1993.

Other New Zealand Publications

Knife Handling in the Meat Industry. Rata Sonny. Meat Industry Training Board and New Zealand Fishing Industry Training Council, Accident Compensation Corporation, 1995.

Knife Management Manual, Sockburn Plant, Alliance Group Ltd., Christchurch, 1994.

Meat Industry Generic, Unit No. 2503, *Sharpen and Maintain Hand Knives in the Meat Processing Industry*. NZ Qualifications Authority.

Additional Publications

Ergonomics in the Meat Industry, Employee Information. American Meat Institute, ErgoTech Incorporated, Washington DC, 1991.

Ergonomics Program, Management Guidelines for Meat Packing Plants. Occupational Safety and Health Administration, US Department of Labor, 1990.

Fitting the Task to the Man: A Textbook of Occupational Ergonomics. 4th Edition, Etienne Grandjean, Taylor & Francis, London/New York, 1988.

Health and Safety Training for Meat Processors: Working Together to Eliminate Accidents. Ontario Ministry of Labour, United and Commercial Workers, Ontario Meat Council, Workers Health and Safety Centre, Ontario, Canada, 1994.

Health Hazard Evaluation Report, HE 80-38-744 Longmont Turkey Processors Inc. Pryor P and Singal M. Longmont, Colorado. Hazard Evaluations and Technical Assistance Branch, NIOSH, 1980.

Manual Handling and Noise in the Poultry Processing Industry: Reducing the Risk. Department of Business and Employment, Industry Services, Occupational Safety and Health Authority, Victoria, Australia, 1995.

Model Code of Practice for Prevention and Management of Repetition Strain Injury. National Occupational Safety and Health Commission, Worksafe Australia, Sydney, 1986.

Psycho-social factors and work-related musculoskeletal diseases. Bongers P, de Winter C R, Kompier M A J and Hildebrandt U V. *Scandinavian Journal of Work, Environment and Health*, Vol. 19 (5) pp. 297- 312, October, 1993.

Repetitive Motion Disorders: The Medical Ergonomics Training Programme: A Guide for the Poultry Industry, Independent Poultry Task Force.

The Ergonomics of Workspaces and Machines. 2nd Edition. Clark T S and Corlett E N, Taylor & Francis, London/New York, 1995.

Work-Related Musculoskeletal Disorders: A Reference Book for Prevention. Kuorinka I and Forcier L (Eds). Taylor & Francis, London/New York, 1995.