

HEALTH AND SAFETY WORKSHOP

MANUAL HANDLING

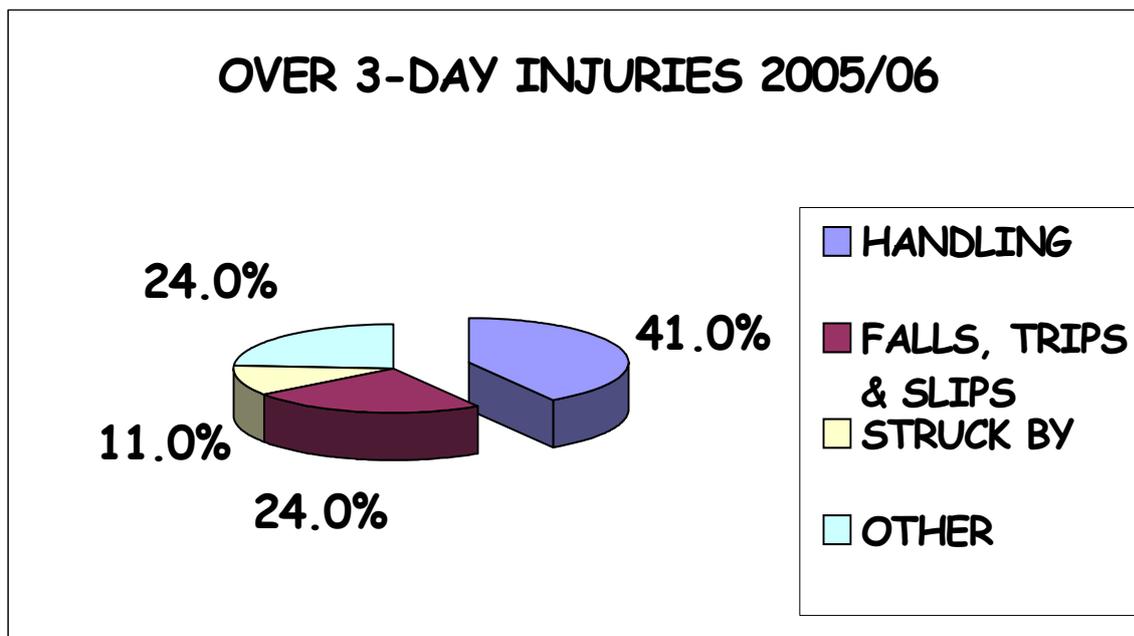
PRINCIPLE CAUSES OF INJURY

What's the problem?

More than a third of all over-three-day injuries reported each year to the Health & Safety Executive and local authorities are caused by manual handling ~ the transporting or supporting of loads by hand or by bodily force.

Most of the reported accidents cause back injury though hands, arms and feet are also vulnerable.

The pie chart shows the pattern for over-three-day injuries reported in 2005/06.



In 2005/6, injuries caused by handling, lifting and carrying;

- Were two fifths of all injuries reported;
- Fell by 5% from 50,737 to 48,078;
- Caused more than 1.9 million lost working days;
- Cost society in excess of an estimated 5 £billion.

By far the biggest problem is the high incidence of musculoskeletal disorders - put simply, back pain and strains of the neck, arm and hands, often attributable to heavy loads, awkward postures, poor seating and prolonged periods of repetitive work (including data entry).

In excess of 1 million people suffered from some kind of musculoskeletal disorder in 2005, which they believed was caused or made worse by their

current or past work.

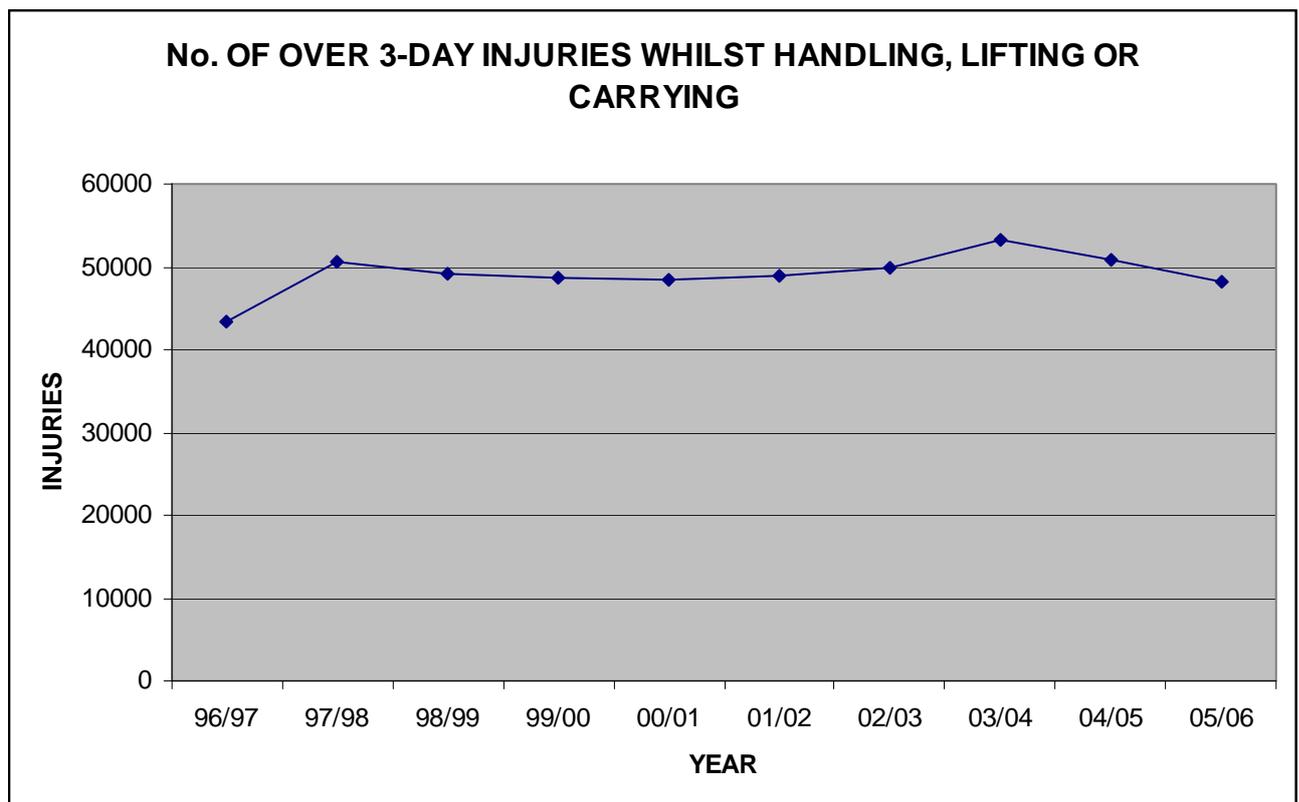
On average each sufferer took 17 days off in 2005/6.

The HSE's statistics show that its efforts to get judges to impose higher fines for health and safety offences may be paying off. In 2001-02, the average fine per case prosecuted rose by 39 per cent to £12,194.

What should I do about it?

Consider the risks from manual handling to the health and safety of your employees. If there are risks, the Manual Handling Operations Regulations 1992 (amended 2002) apply.

Consult and involve the your workers. As well as making good sense, consulting employees on health and safety matters is a legal requirement. If there are safety representatives appointed by trade unions you recognise, the law requires you to consult them. If there are none representing the employees at risk from manual handling, consult the employees themselves or any representative they have elected for health and safety.



What are my duties?

The employer should:

- **Avoid** the need for hazardous manual handling, as far as reasonably practicable;
- **Assess** the risk of injury from any hazardous manual handling that can't be avoided., and
- **Reduce** the risk of injury from hazardous manual handling, as far as reasonably practicable.

Employees also have duties too. They should:

- follow appropriate systems of work laid down for their safety;
- make proper use of equipment provided for their safety;
- co-operate with their employer on health and safety matters;
- inform the employer if they identify hazardous handling activities;
- take care to ensure that their activities do not put others at risk.

Avoid manual handling

For example

Check whether you need to move it at all.

- can large items be worked on where they are? Do they have to be moved?
- can you take the treatment to the patient, not vice versa?
- can raw materials be piped to their point of use?

Consider automation, particularly for new processes.

Think about mechanisation, like the use of a lift truck.

For example:

- A conveyor;
- A pallet truck;
- An electric or hand powered hoist;
- A lift truck.

Beware of new hazards from automation or mechanisation.

For example:

- Automated plant will still need cleaning and maintenance;
- Lift trucks must be suited to the work and have trained operators.

KNOW YOUR LEGAL RESPONSIBILITIES

Manual Handling Operations Regulations 1992

The incorrect handling of loads causes large numbers of injuries and can result in pain, time off work and sometimes-permanent disablement. The Manual Handling Operations Regulations replaced old fashioned and largely ineffective legislation with a modern, ergonomic approach to the problem.

They apply to any manual handling operations, which may cause injury at work. Those operations will be identified by the risk assessment carried out under the Health and Safety (General Provisions) Regulations. They include not only the lifting of loads, but also lowering, pushing, pulling, carrying or moving them, whether by hand or other bodily force.

The regulations are supported by general guidance. More detailed guidance is available for individual industries where there are special needs.

Managers, Safety Co-ordinators and staff have to take three key steps:

- **Avoid** hazardous manual handling operations where reasonably practicable. Consider whether the load must be moved at all. And if it must, whether it can be moved mechanically, for example, by forklift truck.
- **Assess** adequately any hazardous operations that cannot be avoided. An ergonomic assessment should look at more than just the weight of the load. This means considering the shape and size of the load; the way the task is carried out (e.g. the handler's posture); the working environment (e.g. is it cramped or hot?); the individual's capability (e.g. is unusual strength required?). Unless the assessment is very simple a written record of it will be needed. The general guidance will include some simple guidelines to help with assessment; and
- **Reduce** the risk of injury as far as reasonably practicable. A good assessment will not only show whether there is a problem but will also point to where the problem lies. That is the starting point for your improvements. For example, if the load is bulky or heavy it may be possible to use mechanical handling aids or break down the load. If handlers have to adopt an awkward posture you may be able to rearrange the task. Additional training may be required.

CURRENT EEC MANUAL HANDLING LEGISLATION

Legal

The legal requirements are covered by a number of acts of which the principal ones are: -

- **Health and Safety at Work, etc Act 1974**
- **Management of Health and Safety at Work Regulations 1999 (SI 1999 No. 3242)**
- **Manual Handling Operations Regulations 1992 (as amended in 2002) (SI 1992 No. 2793)**
- **Safety Representatives & Safety Committee Regulations 1977**
- **Health and Safety (Consultation with Employees) Regulations 1996**
- **Disability Discrimination Act 1995 (in particular section 6)**

Practical Guidance

Under the Manual Handling Operations Regulations 1992, all manual-handling activities, which involve a risk of injury, should be avoided where possible. If it is not possible to avoid the activity, then an assessment of the associated risks should be undertaken and the risks reduced to the lowest level possible. Self-employed people have the same duties to themselves.

The assessment should take into account:

- **L**oad, such as whether animate (people and animals) or inanimate (boxes, furniture, etc)
- **I**ndividual's capabilities, i.e. the capabilities of the people to perform the activity safely.
- **T**ask, i.e. the activity being carried out;
- **E**nvironment, i.e. where the activity is performed

Loads

These are the objects, people or animals being lifted or moved.

Inanimate loads

The following factors should be taken into account:

- weight
- size dimensions, i.e. bulky/ unwieldy
- flexibility/rigidity
- shifting/moving weight

- stability
- available and effective grip, i.e. presence of handles or straps
- inherent harmful or awkward properties, i.e. hot or cold, splinters, sharp edges, slippery surfaces
- imposed work rates outside the control of the employees.

Animate loads

In addition to the above, the following points should also be addressed for animate loads:

- their level of dependence or ability and willingness to assist themselves
- their level of comprehension and communication
- the likelihood of unpredictable behaviour, fits or spasms, fear and uncertainty of what is happening
- existing medical conditions, i.e. proneness to dislocations, brittle bones
- the presence of medical or scientific/research aids, e.g. body or limb braces, feeding or sample tubes, etc.

Individuals

The individual capabilities of a person to perform a manual handling activity must also be established.

The following factors should be considered:

- level of fitness and strength required
- gender
- age
- height and weight
- pregnancy
- existing health conditions, e.g. heart, respiratory or back problems
- requirements for the use of protective clothing or equipment which could hinder the ability to manually handle a load
- training undertaken and any required
- knowledge and familiarisation of, and adherence to, the correct techniques and procedures.

Task

This is the description of the actual manual handling activity, e.g. lifting boxes, pushing trolleys, etc.

The following factors should be considered:

- whether the loads are held away from the body
- twisting

- reaching upwards, downwards or across, e.g. retrieving heavy files from high, low or wide shelves
- the distance the load has to be carried
- stooping
- strenuous pushing, pulling
- static supporting of a load
- repetitive activities, i.e. the frequency at which the activity is carried out
- the duration of each activity.

Environment

The environment in which a manual handling activity is carried out can also have a significant effect on the overall risk rating of that activity. For example, a hot humid environment will increase the likelihood of tiredness and fatigue over a shift. Similarly a small cramped working area may mean more bending or stooping, which means a bad working posture is adopted. Stairs, steps and other changes in floor level are also important considerations.

The following factors should be considered:

- restricted working space
- poor lighting
- noise
- changes in floor level, including steps and stairs
- poorly maintained floor surfaces and other trip or slip hazards
- very hot or cold temperatures
- high humidity
- limited furniture layout alternatives.

Control Measures

The purpose of the risk assessment is to determine adequate and appropriate control measures to eliminate or at least reduce the risks evaluated in the risk assessment. The following list details common manual handling control measures:

- Splitting larger inanimate loads into smaller units
- obtaining assistance from colleagues
- knowing and accepting personal limitations
- mechanical aids, e.g. hoists for lifting and moving people or forklift trucks for lifting boxes, etc
- other "animate" aids such as belts, glide sheets or transfer boards, height adjustable beds, etc
- planning the activities and any associated movements and routes

- height adjustable workstations
- adequate rest and recovery periods during strenuous and/or repetitive activities
- introducing the right for employees to refuse to carry out manual handling activities which they consider pose an unacceptable risk to their safety and well-being
- drafting and implementing a manual handling policy for the workplace
- comprehensive and clear training information, and instruction - with competent supervision where necessary.

Whatever control measures are introduced, they should be effective and regularly monitored, e.g. by looking at sickness absences accident figures, records of equipment purchase, etc, to ensure their continued effectiveness.

Key Facts

- Manual handling activities must be avoided where there is a risk of injury. If this is not possible the activities must be assessed and any risks reduced as low as is reasonably practicable;
- Manual handling assessments should address **L.I.T.E.:**
 - **L**oad, both animate and inanimate
 - **I**ndividual performing the task
 - **T**ask
 - **E**nvironment

HOW TO CARRY OUT EFFECTIVE RISK ASSESSMENTS

Assessing and reducing the risk of injury

Who should make the assessment?

The assessment is the employer's responsibility. You should be able to do most assessments in-house; you know your business better than anyone. Most will require just a few minutes' observation to identify ways to make the activity easier and less risky, i.e. less physically demanding. Advice from outside experts may be helpful in difficult or unusual cases, or to get you started.

Problems to look for:

The loads, are they:

LOADS	ASSESSMENT
<ul style="list-style-type: none"> ➤ Heavy, bulky or unwieldy? ➤ Difficult to grasp? ➤ Unstable or unpredictable? ➤ Intrinsically harmful, e.g. Sharp or hot? 	

Individual capacity does the job:

INDIVIDUAL CAPACITY	ASSESSMENT
<ul style="list-style-type: none"> ➤ Require unusual capability? ➤ Endanger those with a health problem? ➤ Endanger pregnant women? ➤ Call for special information or training. 	

The tasks, do they involve?

TASK	ASSESSMENT
<ul style="list-style-type: none"> ➤ Holding loads away from the body trunk? ➤ Twisting, stooping or reaching upwards? ➤ Large vertical movement? ➤ Long carrying distances? ➤ Strenuous pushing or pulling? ➤ Unpredictable movement of loads? ➤ Repetitive handling? ➤ Insufficient rest or recovery time? ➤ A work rate imposed by a process? 	

The working environment, are there:

ENVIRONMENT	ASSESSMENT
<ul style="list-style-type: none"> ➤ Constraints on posture? ➤ Poor floors? ➤ Variations in levels? ➤ Hot/cold/humid conditions? ➤ Strong air movements? ➤ Poor lighting conditions? ➤ Restrictions on movement or posture from clothes or personal protective equipment? 	

What role can employees play in carrying out assessments?

Your employees can help you carry out the assessment - they often know what problems there are and how best to solve them. If their work is varied

or not closely supervised, make sure they are aware what risks to look for when manual handling, and what to do about them. But the final responsibility for assessments rests with employers.

Do assessments need to be recorded?

No, except where it would not be easy to repeat the assessment. In such cases the significant findings should be recorded and kept.

Do I have to do assessments for each individual employee and workplace?

No. It's quite acceptable to do a generic assessment that is common to several employees or to more than one site or type of work.

The important thing is to identify the risk of injury and point the way to practical improvements.

How should I use my assessment?

Don't just forget it or file it away. The purpose of the assessment is to pinpoint the worst features of the work - and they're the ones you should try to improve first. It is also important to remember to update the assessment when significant changes are made to the workplace.

Ways of reducing the risk of injury

CAN YOU:-	YES/NO
➤ Improve workplace layout to improve efficiency?	
➤ Reduce the amount of twisting and stooping?	
➤ Avoid lifting from floor level or above shoulder height?	
➤ Reduce carrying distances?	
➤ Avoid repetitive handling?	
➤ Vary the work, allowing one set of to rest while another is used?	

CAN YOU MAKE THE LOAD	YES/NO

- | | |
|---|--|
| <ul style="list-style-type: none">➤ Lighter or less bulky?➤ Easier to grasp?➤ More stable?➤ Less damaging to hold? <p><i>Have you asked your suppliers to help?</i></p> | |
|---|--|

CAN YOU:	YES/NO
<ul style="list-style-type: none"> ➤ Remove obstructions to free movement? ➤ Provide better flooring? ➤ Avoid steps and steep ramps? ➤ Prevent extremes of hot and cold? ➤ Improve lighting? ➤ Consider less restrictive clothing or personal protective equipment? 	

CAN YOU	YES/NO
<ul style="list-style-type: none"> ➤ Take better care of those who have a physical weakness or are pregnant? ➤ Give your employees more information, e.g. about the range of tasks they are likely to face? ➤ Provide training? 	

How far must I reduce the risk?

To the lowest level 'reasonably practicable'. That means reducing the risk until the cost of any further precautions ~ in time, trouble or money - would be far too great in proportion to the benefits.

Do I have to provide mechanical aids in every case?

You should definitely provide mechanical aids if it is reasonably practicable to do so and the risks identified in your risk assessment can be reduced or eliminated by this means. But you should consider mechanical aids in other situations as well as safety. Even something as simple as a sack truck can make a big improvement.

What about training?

Training is important but remember that, on its own, it can't overcome:

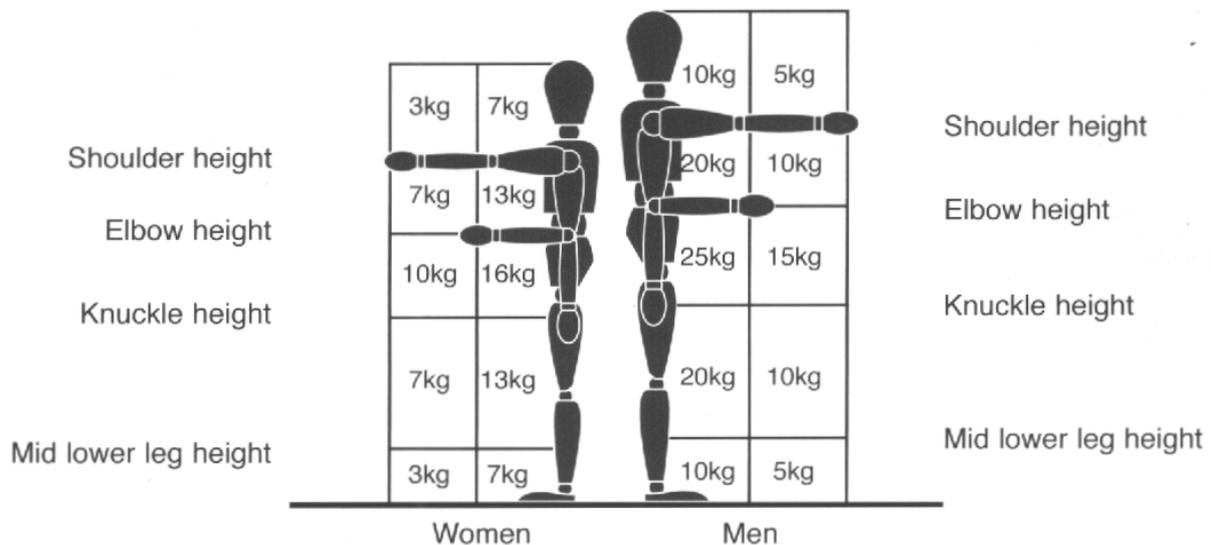
- a lack of mechanical aids;
- bad working conditions;
- unsuitable loads;

Training should cover:

- manual handling risk factors and how injuries occur;
- how to carry out safe manual handling techniques;
- appropriate systems of work for the individual's tasks and environment;
- use of mechanical aids;
- practical work that identifies and corrects non-safe practice.

General risk assessment guidelines

•



- Each box in the diagram above shows guideline weights for lifting lowering;
- Observe the activity and compare to the diagram. If the lifter's hands enter more than one box during the operation, use the smallest weight. Use an in between weight if the hands are close to a boundary between boxes. If the operation must take place with the hands beyond the boxes, make a more detailed assessment.
- The weights assume that the load is readily grasped with both hands;

- The operation takes place in reasonable working conditions;
- Any operation involving more than twice the guideline weights should be rigorously assessed even for very fit, well trained individuals working under favourable conditions;
- There is no such thing as a completely 'safe' manual handling operation. But working within the guidelines will cut the risk and reduce the need for a more detailed assessment.

Twisting

Reduce the guideline weights if the lifter twists to the side during the operation. As a rough guide, reduce them by 10% if the handler twists beyond 45 degrees, and by 20% if the handler twists beyond 90 degrees.

Frequent lifting and lowering

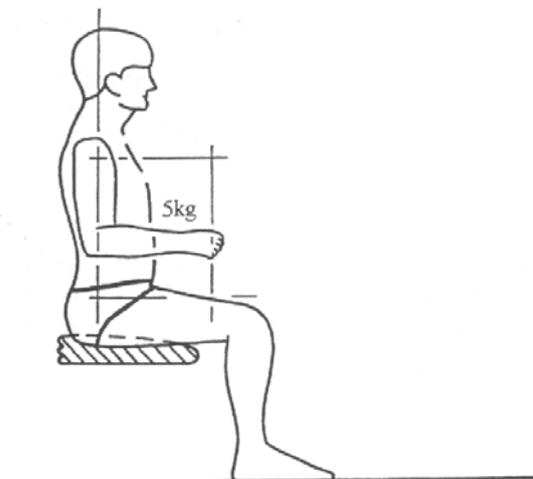
The guideline weights are for infrequent operations, up to about 30 operations per hour, where the pace of work is not forced, adequate pauses to rest or use different muscles are possible, and the load is not supported for any length of time.

Reduce the weights if the operation repeated more often.

As a rough guide, **reduce the weights by 30% if the operation is repeated five to eight times a minute.**

Reduce by 80% where the operation repeated more than 12 times a minute.

Handling while seated?



The guideline figure for handling operations carried out while seated is shown and applies only when the hands are within the box zone indicated. If handling beyond the box zone is unavoidable a more detailed assessment should be made.

Loads that can be handled in safety by a person who is seated are substantially less than can be dealt with while standing. This activity therefore demands

particular care. Lifting loads from the floor while seated should be avoided

where possible.

The possibility of accidental movement of the seat should be considered. Castors may be inadvisable, especially on hard floors. A swivel-action seat will help the handler to face the load without having to twist the trunk. The relative heights of seats and work surfaces should be well matched.

Are you saying I mustn't exceed the guidelines?

No. The risk assessment guidelines are not safe limits for lifting. But work outside the guidelines is likely to increase the risk of injury, so you should examine it closely for possible improvements. You should remember that you must make the work less demanding if it's reasonably practicable to do so.

SAFE HANDLING & LIFTING OF LOADS

Manual handling of loads

When manual handling forms part of an employees working routine, it is the responsibility of the employer to ensure that this task is carried out in a safe manner. It is up to every employer to carry out a risk assessment. If it is recognised that the employee is being asked to or expected to lift dangerous loads, action must be taken.

The **Health and Safety Executive** have issued guidelines on what constitutes a safe lift. It is important to note that these recommendations are guidelines only, and should not be misinterpreted.

Once it is determined that a problem exists, there are several courses of action that can be considered:

- 1 Is the lift really necessary? - Can the lift be eliminated by using conveyors etc
- 2 Can the load be reduced? - Is it possible to reduce the weight by using smaller boxes or packs etc
- 3 Does the task have to be carried out manually? - Can it be done by machine, or can a lift assist be used?

In most cases, one of the above answers will provide a suitable solution to most typical handling problems.

In the case of lift assistors, there are many different options, some have distinct advantages and disadvantages, which have to be taken into account when considering the alternatives.

Here are a few examples:

Forklift Truck.

Fork trucks are readily available in most industrial factories, and can provide a cost-effective solution for occasional lifts. There are however disadvantages to this solution when more numerous lifts are needed. Forklifts are expensive to tie up, and waiting time is very costly and non-productive. Forklifts are also limited in the types of task they are suitable for.

Platform / Lift Tables.

These can offer a low cost solution to ergonomic problems involving pallets or stillages. When used in conjunction with a rotary turntable, they can be

used to increase the safe load carrying capacity by preventing reaching. The disadvantages of this type of assist are that some may require costly civil work to be undertaken, and they are inflexible in that they remain fixed in one position. Care should also be taken to ensure that you do not increase the likelihood of repetitive strain injuries, because the same muscles are being used continually.

Chain Hoists.

These come in three main types, Manual Electric and Pneumatic. They offer cost effective solutions to many handling applications, but have a limited range of tools that can be classified as failsafe. They are ideally suited to lifting applications where overhead access is unrestricted. The drawbacks are that they can be slow, and one hand is usually required to operate the controls.

Overhead Cranes.

As with fork trucks, if only occasional lifts are required, these can offer a low cost solution, but can prove costly in waiting time where more regular lifts are required. As with hoists, open access is required above the load at all times, and tooling options are limited.

Robots.

Robots can only be a cost-effective option when there are a large number of lifts involving similar items. Whilst they usually totally eliminate the need for manual handling, their cost will limit practical use in most typical handling situations. They tend to be inflexible and tool changes can be expensive.

Extra Manpower.

It may sometimes be practical to use extra manpower for certain types of occasional lift. The disadvantages are cost and also the fact that it can be extremely dangerous for 2 or more people carrying the same item (in the event of trip or slip, serious injury can result)

Balancers / Manipulators.

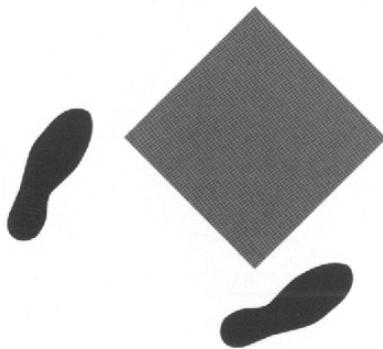
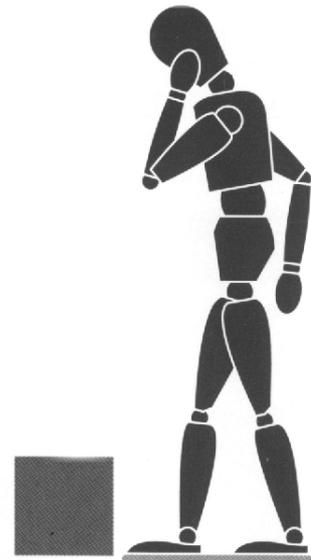
Available in Electronic, Pneumatic Vacuum and hydraulic variants, this type of lifting aid can offer assistance in most manual lifting situations. They can usually be floor or overhead mounted, and some are available as mobile units. They are a very flexible piece of equipment with tooling changes taking moments. They are usually easy to operate, and have low running costs. Initial outlay can be high, but sometimes, this is the only piece of equipment that will solve certain handling issues.

Good manual handling technique

If you have to lift something manually, then here are some important points, using a basic lifting operation as an example.

Stop and think

- Plan the lift.
- Where is the load to be placed?
- Use appropriate handling aids if possible.
- Do you need help with the load?
- Remove obstructions such as discarded wrapping materials.
- For a long lift, such as floor to shoulder height, consider resting the load mid-way on a table or bench to change grip.



Position the feet

- Feet apart, giving a balanced and stable base for lifting (tight skirts and unsuitable footwear make this difficult).
- Leading leg as far forward as is comfortable and if possible, pointing in the direction you intend to go.

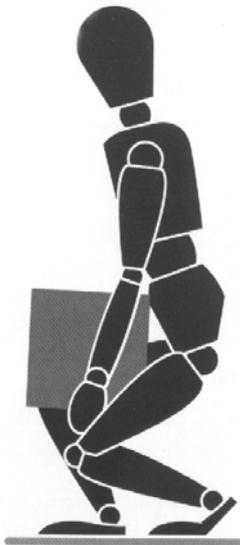
Adopt a good

- When lifting from a knees.
- Do not kneel or
- Keep the back maintaining its (tucking in the
- Lean forward a if necessary to get
- Keep the shoulders the same direction



posture

low level, bend the
overflex the knees.
straight,
natural curve
chin helps).
little over the load
a good grip.
level and facing in
as the hips.



Get a firm grip

- Try to keep the arms within the boundary formed by the legs.
- The best position and type of grip depends on the circumstances and individual preference; but must be secure.
- A hook grip is less tiring than keeping the fingers straight.
- If you need to vary the grip as the lift proceeds, do it as smoothly as possible.

Keep close to the load

- Keep the load close to the trunk for as long as possible.
- Keep heaviest side of the load next to the trunk.
- If a close approach to the load is not possible, slide it towards you before trying to lift.

Don't jerk

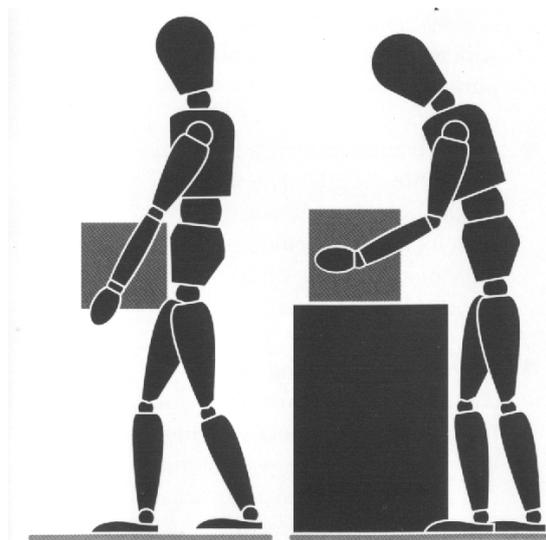
- Lift smoothly, raising the chin as the lift begins, keeping control of the load.

Move the feet

- Don't twist the trunk when turning to the side.

Put down, then adjust

- If precise positioning of the load is necessary, put it down first, then slide it into the desired position.



Good handling technique for pushing and pulling

Some practical points to remember:

- **Handling devices.** Aids such as barrows and trolleys should have handle heights that are between the shoulder and waist. They should be well maintained and run smoothly.
- **Force.** As a rough guide the amount of force that is needed to move a load over a flat, level surface, using a well maintained handling aid is at least 2% of the load. E.g. if the load weighed 400 kg then the force needed to move it would be 8 kg. The force will be much greater if conditions are not perfect. Operators should try to push rather than pull when moving a load.
- **Slopes.** Employees should get help from other workers when they have to negotiate a slope as pushing and pulling forces can be very high. E.g. if a 400 kg load is moved up a slope of 1 in 12 (about 5%) the required force is over 30 kg even in perfect conditions. This is above the guideline weight men and well above that for woman.
- **Uneven surfaces.** Moving a load over soft or uneven surfaces requires higher forces. On uneven surfaces the force needed to start a load moving could increase by as much as 10% and soft ground makes this even

worse.

- **Stand and pace.** To make it easier employees should keep their feet well away from the load keep to walking pace.

How do I know if there's a risk of injury?

It's a matter of judgement in each case, but there are certain things to look out for, such as people puffing and sweating, excessive fatigue, bad posture, cramped work areas, awkward or heavy loads or a history of back troubles. Operators can often highlight which activities are unpopular, difficult or arduous.

Can you be more definite?

There is no such thing as a completely 'safe' manual handling operation. It's difficult to be precise. So many factors vary between jobs, workplaces and people. But the general risk assessment guidelines should help to identify when a more detailed risk assessment is necessary. Working within the guidelines will reduce the need for a more detailed risk assessment.

These notes are based on HSE publications, including:-

- Getting to Grips With Manual Handling - A short guide
- Manual Handling Guidance regulations