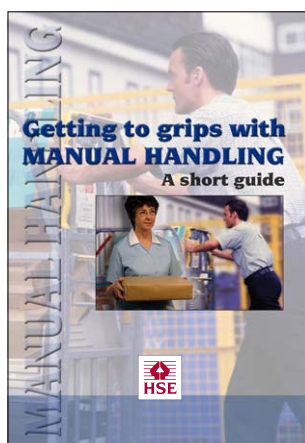


# Getting to grips with manual handling

## A short guide

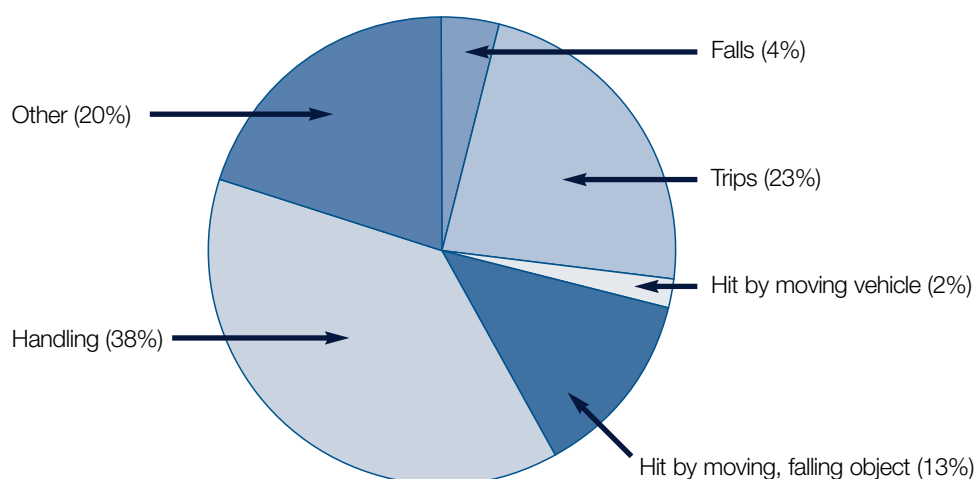


This booklet explains the problems associated with manual handling and sets out best practice in dealing with them. The advice is intended for managers of small firms or similar organisations. But the general principles are relevant to all workplaces, whatever their size. Avoiding injuries from manual handling makes sound business sense.

The Manual Handling Operations Regulations 1992, as amended in 2002 ('the Regulations') apply to a wide range of manual handling activities, including lifting, lowering, pushing, pulling or carrying. The load may be either inanimate - such as a box or a trolley, or animate - a person or an animal. This guidance gives useful practical advice for employers, managers, safety representatives and individual employees on how to reduce the risk of injury from manual handling.

### What's the problem?

More than a third of all over-three-day injuries reported each year to HSE and local authorities are caused by manual handling - the transporting or supporting of loads by hand or by bodily force. The pie chart shows the pattern for over-three-day injuries reported in 2001/02.



**Figure 1** Kinds of accident causing over-three-day injury, 2001/02

The most recent survey of self-reported work-related illness estimated that in 2001/02, 1.1 million people in Great Britain suffered from musculoskeletal disorders (MSDs) caused or made worse by their current or past work. An estimated 12.3 million working days were lost due to these work-related MSDs. On average each sufferer took about 20 days off in that 12-month period.

Manual handling injuries can occur wherever people are at work - on farms and building sites, in factories, offices, warehouses, hospitals, banks, laboratories, and while making deliveries. Heavy manual labour, awkward postures, manual materials handling, and previous or existing injury are all risk factors implicated in the development of MSDs. More information and advice on MSDs is available on the HSE website, including advice on managing back pain at work (see 'Further reading').

Prevention and control of MSDs, such as manual handling injuries, has been identified as a priority by the Health and Safety Commission. Taking the action described in this booklet will help prevent these injuries and is likely to be cost-effective. However you cannot prevent all MSDs, so it is still essential to encourage early reporting of symptoms and make arrangements for the proper treatment and rehabilitation of anybody who does get injured.

## **What should I do about it?**

**Consider** the risks from manual handling to the health and safety of your employees - the rest of this booklet will help you to do this. If there are risks, the Regulations apply.

**Consult and involve** the workforce. Your employees and their representatives know first-hand what the risks in the workplace are. So they can probably offer practical solutions to controlling them.

## **What are my duties?**

The Regulations require employers to:

- **avoid** the need for hazardous manual handling, so far as is 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, so far as is reasonably practicable.

These points are explained in detail under 'Avoiding manual handling' and 'Assessing and reducing the risk of injury'.

Employees 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.

## Avoiding manual handling

### *Check whether you need to move it at all*

For example:

- does a large workpiece really need to be moved, or can the activity (eg wrapping or machining) safely be done where the item already is?
- can you take the treatment to the patient, not vice versa?
- can raw materials be piped to their point of use?

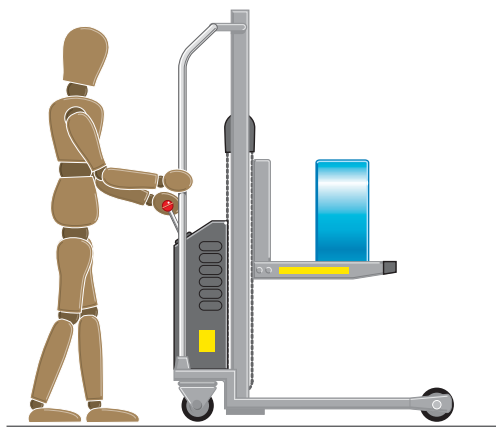
### *Consider automation, particularly for new processes*

### *Think about mechanisation and using handling aids*

For example:

- a conveyor;
- a pallet truck;
- an electric or hand-powered hoist;
- a lift truck.

But **beware of new hazards** from automation or mechanisation.



For example:

- automated plant still needs cleaning, maintenance etc;
- lift trucks must be suited to the work and have properly train operators.

## 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, your employees and safety representatives know your business better than anyone. Most situations will require just a few minutes' observation to identify ways to make the activity easier and less risky, ie less physically demanding. Later in this booklet you will find easy-to-use guidelines to help decide whether there are risky lifting activities where a full assessment is required. Advice from outside experts may be helpful in difficult or unusual cases, or to get you started. See Table 1 for the kind of problems to look for.

### *What role can employees and their representatives 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. You have duties under the Safety Representatives and Safety Committees Regulations 1977 and the Health and Safety (Consultation with Employees) Regulations 1996 to consult and keep safety representatives and employees up to date. Consultation with them will offer the best solutions as they are best placed to know how the job works and what can be done to improve it. It is especially useful to get your employees' input when buying new equipment.

### *Do assessments need to be recorded?*

It is often useful to record and keep the main findings, and this should always be done if it would be difficult to repeat the assessment. However, an assessment need not be recorded if:

- it could very easily be repeated and explained at any time because it is simple and obvious; or
- the handling operations are low risk, and are going to last a very short time.

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

It is sometimes acceptable to do a 'generic' assessment - one that is common to several employees or to more than one site or type of work. However:

- this should only be done if there are no individual or local factors which need to be taken into account, for example differences in stature, competence etc;
- you should review any generic risk assessment if individual employees report adverse symptoms, become ill, injured or disabled, or return following a long period of sickness, as they may have become vulnerable to risk.

Remember, you may need to carry out individual risk assessments for employees with a disability and to comply with the requirements of the Disability Discrimination Act 1995 (in particular section 6).

*The important thing in all assessments is to identify all significant risks 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 (see Table 1). It is also important to remember to update the assessment when significant changes are made to the workplace.

All employees covered by a risk assessment - including generic assessments - should be told about the risks it identifies.

**Table 1** Making an assessment (cont'd on next page)

Problems to look for when making an assessment	Ways of reducing the risk of injury
<p><i>The tasks, do they involve:</i></p> <ul style="list-style-type: none"> <li>■ holding loads away from the body?</li> <li>■ twisting, stooping or reaching upwards?</li> <li>■ large vertical movement?</li> <li>■ long carrying distances?</li> <li>■ strenuous pushing or pulling?</li> <li>■ repetitive handling?</li> <li>■ insufficient rest or recovery time?</li> <li>■ a work rate imposed by a process?</li> </ul>	<p><i>Can you:</i></p> <ul style="list-style-type: none"> <li>■ use a lifting aid?</li> <li>■ improve workplace layout to improve efficiency?</li> <li>■ reduce the amount of twisting and stooping?</li> <li>■ avoid lifting from floor level or above shoulder height, especially heavy loads?</li> <li>■ reduce carrying distances?</li> <li>■ avoid repetitive handling?</li> <li>■ vary the work, allowing one set of muscles to rest while another is used?</li> <li>■ push rather than pull?</li> </ul>
<p><i>The loads, are they:</i></p> <ul style="list-style-type: none"> <li>■ heavy, bulky or unwieldy?</li> <li>■ difficult to grasp?</li> <li>■ unstable or likely to move unpredictably (like animals)?</li> <li>■ harmful, eg sharp or hot?</li> <li>■ awkwardly stacked?</li> <li>■ too large for the handler to see over?</li> </ul>	<p><i>Can you make the load:</i></p> <ul style="list-style-type: none"> <li>■ lighter or less bulky?</li> <li>■ easier to grasp?</li> <li>■ more stable?</li> <li>■ less damaging to hold?</li> </ul> <p>If the load comes in from elsewhere, have you asked the supplier to help, eg provide handles or smaller packages?</p>
<p><i>The working environment, are there:</i></p> <ul style="list-style-type: none"> <li>■ constraints on posture?</li> <li>■ bumpy, obstructed or slippery floors?</li> <li>■ variations in levels?</li> <li>■ hot/cold/humid conditions?</li> <li>■ gusts of wind or other strong air movements?</li> <li>■ poor lighting conditions?</li> <li>■ restrictions on movements or posture from clothes or personal protective equipment (PPE)?</li> </ul>	<p><i>Can you:</i></p> <ul style="list-style-type: none"> <li>■ remove obstructions to free movement?</li> <li>■ provide better flooring?</li> <li>■ avoid steps and steep ramps?</li> <li>■ prevent extremes of hot and cold?</li> <li>■ improve lighting?</li> <li>■ provide protective clothing or PPE that is less restrictive?</li> <li>■ ensure your employees' clothing and footwear is suitable for their work?</li> </ul>

**Table 1** Making an assessment (cont'd)

Problems to look for when making an assessment	Ways of reducing the risk of injury
<p><i>Individual capacity, does the job:</i></p> <ul style="list-style-type: none"> <li>■ require unusual capability, eg above-average strength or agility?</li> <li>■ endanger those with a health problem or learning/physical disability?</li> <li>■ endanger pregnant women?</li> <li>■ call for special information or training?</li> </ul>	<p><i>Can you:</i></p> <ul style="list-style-type: none"> <li>■ pay particular attention to those who have a physical weakness?</li> <li>■ take extra care of pregnant workers?</li> <li>■ give your employees more information, eg about the range of tasks they are likely to face?</li> <li>■ provide more training (see 'What about training?')</li> </ul> <p>Get advice from an occupational health advisor if you need to.</p>
<p><i>Handling aids and equipment:</i></p> <ul style="list-style-type: none"> <li>■ is the device the correct type for the job?</li> <li>■ is it well maintained?</li> <li>■ are the wheels on the device suited to the floor surface?</li> <li>■ do the wheels run freely?</li> <li>■ is the handle height between the waist and shoulders?</li> <li>■ are the handle grips in good order and comfortable?</li> <li>■ are there any brakes? If so, do they work?</li> </ul>	<p><i>Can you:</i></p> <ul style="list-style-type: none"> <li>■ provide equipment that is more suitable for the task?</li> <li>■ carry out planned preventive maintenance to prevent problems?</li> <li>■ change the wheels, tyres and/or flooring so that equipment moves easily?</li> <li>■ provide better handles and handle grips?</li> <li>■ make the brakes easier to use, reliable and effective?</li> </ul>
<p><i>Work organisation factors:</i></p> <ul style="list-style-type: none"> <li>■ is the work repetitive or boring?</li> <li>■ is work machine or system-paced?</li> <li>■ do workers feel the demands of the work are excessive?</li> <li>■ have workers little control of the work and working methods?</li> <li>■ is there poor communication between managers and employees?</li> </ul>	<p><i>Can you:</i></p> <ul style="list-style-type: none"> <li>■ change tasks to reduce the monotony?</li> <li>■ make more use of workers' skills?</li> <li>■ make workloads and deadlines more achievable?</li> <li>■ encourage good communication and teamwork?</li> <li>■ involve workers in decisions?</li> <li>■ provide better training and information?</li> </ul>



Consider mechanical aids; even a sack truck can make a big improvement.

### 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 - time, effort 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 - they can improve productivity 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;
- unsuitable loads;
- bad working conditions.

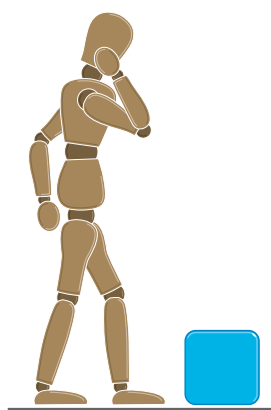
### Training should cover:

- manual handling risk factors and how injuries can occur;
- how to carry out safe manual handling including good handling technique (see 'Good handling technique for lifting' and 'Good handling technique for pushing and pulling');
- appropriate systems of work for the individual's tasks and environment;
- use of mechanical aids;
- practical work to allow the trainer to identify and put right anything the trainee is not doing safely.

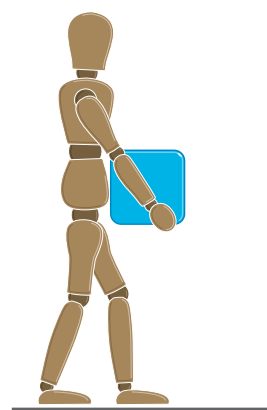
### Good handling technique for lifting

Here are some practical tips, suitable for use in training people in safe manual handling. In the following section a basic lifting operation is taken as an example.

Think before lifting/handling. Plan the lift. Can handling aids be used? Where is the load going to be placed? Will help be needed with the load? Remove obstructions such as discarded wrapping materials. For a long lift, consider resting the load midway on a table or bench to change grip.



Think before lifting/handling



Keep the load close to the waist



Adopt a stable position with feet apart and one leg slightly forward to maintain balance



Start in a good posture

Keep the load close to the waist. Keep the load close to the body for as long as possible while lifting. Keep the heaviest side of the load next to the body. If a close approach to the load is not possible, try to slide it towards the body before attempting to lift it.

Adopt a stable position. The feet should be apart with one leg slightly forward to maintain balance (alongside the load, if it is on the ground). The worker should be prepared to move their feet during the lift to maintain their stability. Avoid tight clothing or unsuitable footwear, which may make this difficult.

Get a good hold. Where possible the load should be hugged as close as possible to the body. This may be better than gripping it tightly with hands only. Start in a good posture. At the start of the lift, slight bending of the back, hips and knees is preferable to fully flexing the back (stooping) or fully flexing the hips and knees (squatting).

Don't flex the back any further while lifting. This can happen if the legs begin to straighten before starting to raise the load.

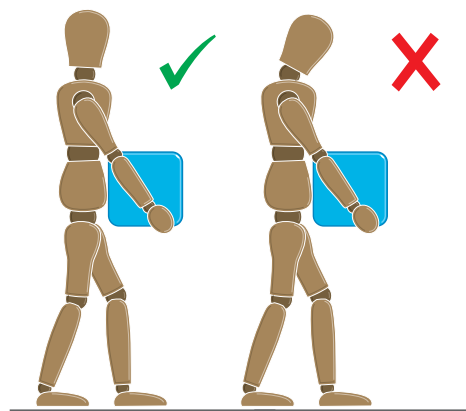
Avoid twisting the back or leaning sideways, especially while the back is bent. Shoulders should be kept level and facing in the same direction as the hips. Turning by moving the feet is better than twisting and lifting at the same time.

Keep the head up when handling. Look ahead, not down at the load, once it has been held securely.

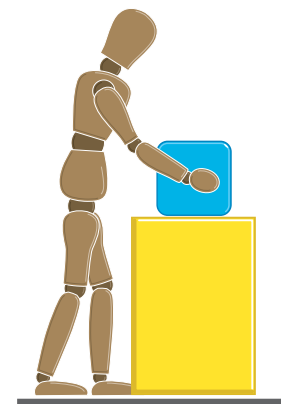
Move smoothly. The load should not be jerked or snatched as this can make it harder to keep control and can increase the risk of injury.

Don't lift or handle more than can be easily managed. There is a difference between what people can lift and what they can safely lift. If in doubt, seek advice or get help.

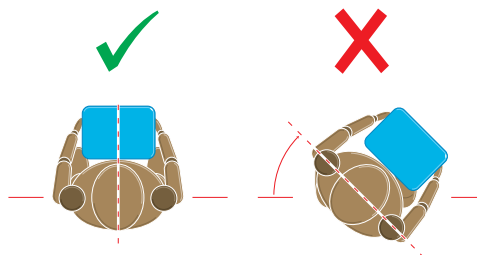
Put down, then adjust. If precise positioning of the load is necessary, put it down first, then slide it into the desired position.



Keep the head up when handling



Put down, then adjust



Avoid twisting the back or leaning sideways, especially while the back is bent



## General risk assessment guidelines

There is no such thing as a completely 'safe' manual handling operation. But working within the following guidelines will cut the risk and reduce the need for a more detailed assessment.

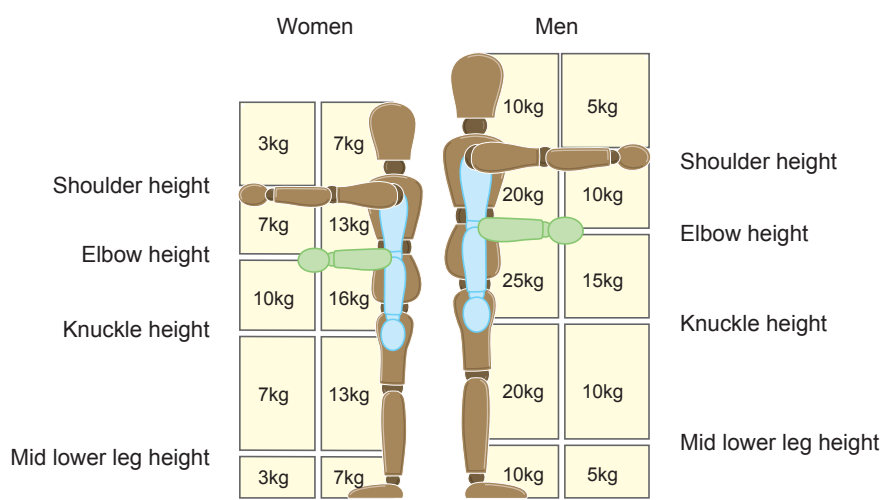


Figure 2 Lifting and lowering

Use Figure 2 to make a quick and easy assessment. Each box contains a guideline weight for lifting and lowering in that zone. (As you can see, the guideline weights are reduced if handling is done with arms extended, or at high or low levels, as that is where injuries are most likely to occur.)

Observe the work activity you are assessing and compare it to the diagram. First, decide which box or boxes the lifter's hands pass through when moving the load. Then, assess the maximum weight being handled. If it is less than the figure given in the box, the operation is within the guidelines.

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.

The guideline weights assume that the load is readily grasped with both hands and that the operation takes place in reasonable working conditions, with the lifter in a stable body position.

### Twisting

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

### 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 by the handler for any length of time. Reduce the weights if the operation is repeated more often. As a rough guide, reduce the weights by 30% if the operation is repeated once or twice per minute, by 50% if the operation is repeated five to eight times a minute, and by 80% where the operation is repeated more than 12 times a minute.



Adopt a stable position with feet apart and one leg slightly forward to maintain balance



Start in a good posture

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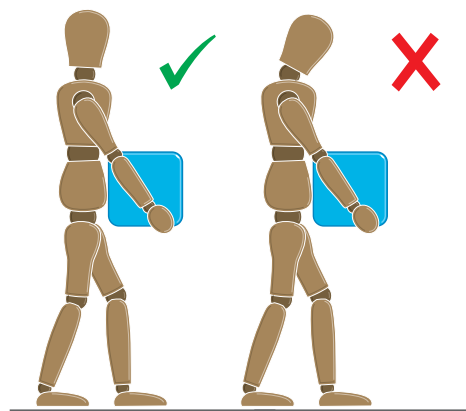
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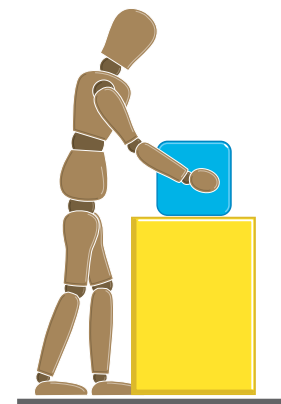
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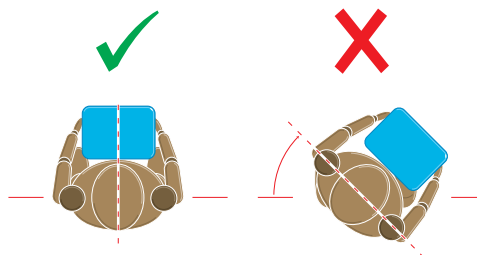
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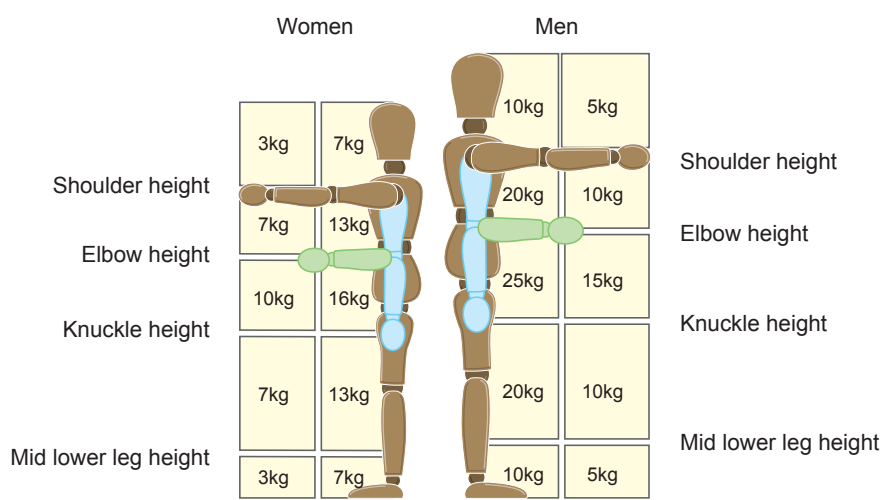


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### Twisting

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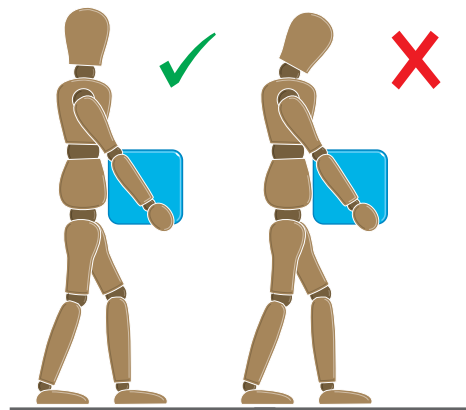


Adopt a stable position with feet apart and one leg slightly forward to maintain balance

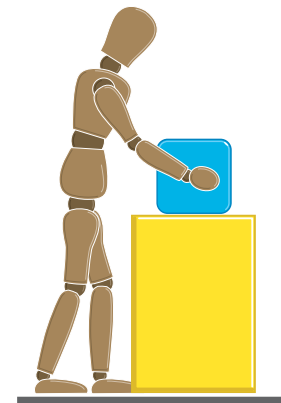


Start in a good posture

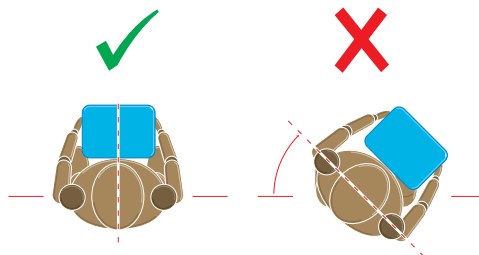
- **Keep the load close to the waist.** Keep the load close to the body for as long as possible while lifting. Keep the heaviest side of the load next to the body. If a close approach to the load is not possible, try to slide it towards the body before attempting to lift it.
- **Adopt a stable position.** The feet should be apart with one leg slightly forward to maintain balance (alongside the load, if it is on the ground). The worker should be prepared to move their feet during the lift to maintain their stability. Avoid tight clothing or unsuitable footwear, which may make this difficult.
- **Get a good hold.** Where possible the load should be hugged as close as possible to the body. This may be better than gripping it tightly with hands only.
- **Start in a good posture.** At the start of the lift, slight bending of the back, hips and knees is preferable to fully flexing the back (stooping) or fully flexing the hips and knees (squatting).
- **Don't flex the back any further while lifting.** This can happen if the legs begin to straighten before starting to raise the load.
- **Avoid twisting the back or leaning sideways,** especially while the back is bent. Shoulders should be kept level and facing in the same direction as the hips. Turning by moving the feet is better than twisting and lifting at the same time.
- **Keep the head up when handling.** Look ahead, not down at the load, once it has been held securely.
- **Move smoothly.** The load should not be jerked or snatched as this can make it harder to keep control and can increase the risk of injury.
- **Don't lift or handle more than can be easily managed.** There is a difference between what people can lift and what they can safely lift. If in doubt, seek advice or get help.
- **Put down, then adjust.** If precise positioning of the load is necessary, put it down first, then slide it into the desired position.



Keep the head up when handling



Put down, then adjust



Avoid twisting the back or leaning sideways, especially while the back is bent

## Good handling technique for pushing and pulling

Here are some practical points to remember when loads are pushed or pulled.

- **Handling devices.** Aids such as barrows and trolleys should have handle heights that are between the shoulder and waist. Devices should be well-maintained with wheels that run smoothly (the law requires that equipment is maintained). When purchasing new trolleys etc, ensure they are of good quality with large diameter wheels made of suitable material and with castors, bearings etc which will last with minimum maintenance. Consultation with your employees and safety representatives will help, as they know what works and what doesn't.
- **Force.** As a rough guide the amount of force that needs to be applied to move a load over a flat, level surface using a well-maintained handling aid is at least 2% of the load weight. For example, if the load weight is 400 kg, then the force needed to move the load is 8 kg. The force needed will be larger, perhaps a lot larger, if conditions are not perfect (eg wheels not in the right position or a device that is poorly maintained). The operator should try to push rather than pull when moving a load, provided they can see over it and control steering and stopping.
- **Slopes.** Employees should enlist help from another worker whenever necessary if they have to negotiate a slope or ramp, as pushing and pulling forces can be very high. For example, if a load of 400 kg is moved up a slope of 1 in 12 (about 5°), the required force is over 30 kg even in ideal conditions - good wheels and a smooth slope. This is above the guideline weight for men and well above the guideline weight for women.
- **Uneven surfaces.** Moving an object over soft or uneven surfaces requires higher forces. On an uneven surface, the force needed to start the load moving could increase to 10% of the load weight, although this might be offset to some extent by using larger wheels. Soft ground may be even worse.
- **Stance and pace.** To make it easier to push or pull, employees should keep their feet well away from the load and go no faster than walking speed. This will stop them becoming too tired too quickly.

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

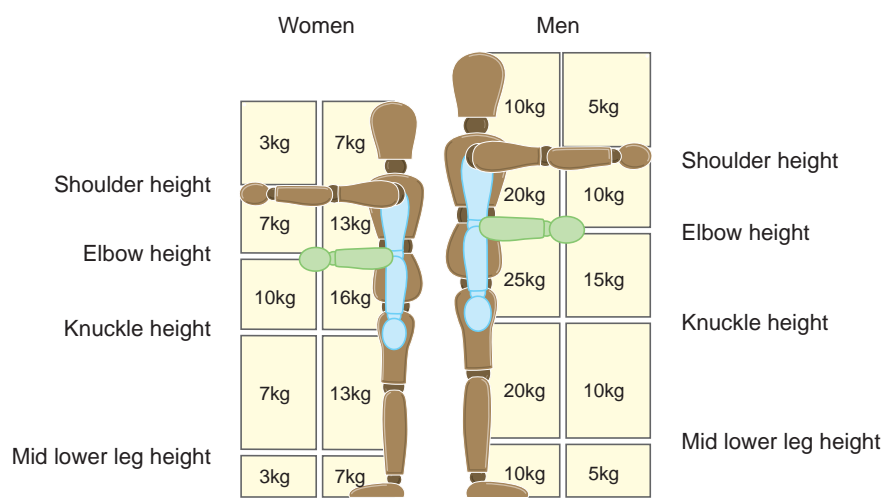
It's a matter of judgement in each case, but there are certain things to look out for, such as people puffing and sweating, excessive fatigue, bad posture, cramped work areas, awkward or heavy loads or a history of back trouble. Operators can often highlight which activities are unpopular, difficult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

### *Can you be more definite?*

It is difficult to be precise - so many factors vary between jobs, workplaces and people. But the general risk assessment guidelines in the next section should help to identify when a more detailed risk assessment is necessary.

## General risk assessment guidelines

There is no such thing as a completely 'safe' manual handling operation. But working within the following guidelines will cut the risk and reduce the need for a more detailed assessment.



**Figure 2** Lifting and lowering

- Use Figure 2 to make a quick and easy assessment. Each box contains a guideline weight for lifting and lowering in that zone. (As you can see, the guideline weights are reduced if handling is done with arms extended, or at high or low levels, as that is where injuries are most likely to occur.)
- Observe the work activity you are assessing and compare it to the diagram. First, decide which box or boxes the lifter's hands pass through when moving the load. Then, assess the maximum weight being handled. If it is less than the figure given in the box, the operation is within the guidelines.
- 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.
- The guideline weights assume that the load is readily grasped with both hands and that the operation takes place in reasonable working conditions, with the lifter in a stable body position.

### Twisting

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

### 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 by the handler for any length of time. Reduce the weights if the operation is repeated more often. As a rough guide, reduce the weights by 30% if the operation is repeated once or twice per minute, by 50% if the operation is repeated five to eight times a minute, and by 80% where the operation is repeated more than 12 times a minute.

### *Pushing and pulling*

The task is within the guidelines if the following figures are not exceeded:

	Men	Women
Force to stop or start the load	20 kg	15 kg
Sustained force to keep the load in motion	10 kg	7 kg

See 'Good handling technique for pushing and pulling' for some examples of forces required to push or pull loads.

### *Using the results: Do I need to make a more detailed assessment?*

Using Figure 2 is a first step. If it shows the manual handling is within the guideline figures (bearing in mind the reduced limits for twisting and for frequent lifts) you need not do any more in most cases. But you will need to make a more detailed assessment if:

- the conditions given for using the guidelines (eg that the load can be readily grasped with both hands) are not met;
- the person doing the lifting has reduced capacity, eg through ill health or pregnancy;
- the handling operation must take place with the hands beyond the boxes in the diagram; or
- the guideline figures in the diagram are exceeded.

For pushing and pulling, you should make a more detailed assessment if:

- there are extra risk factors like uneven floors or confined spaces;
- the worker can't push or pull the load with their hands between knuckle and shoulder height;
- the load has to be moved for more than about 20 m without a break; or
- the guideline figures in the table are likely to be exceeded.

More advice on how to make a more detailed assessment is given in our main guidance booklet *Manual handling*. Guidance on regulations (see 'Further reading' for details).

HSE has also developed a tool called the Manual Handling Assessment Chart (MAC), to help you assess the most common risk factors in lifting, carrying and team handling. You may find the MAC useful to help identify high-risk manual handling operations and to help complete detailed risk assessments. It can be downloaded from [www.hse.gov.uk/msd](http://www.hse.gov.uk/msd).

### *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 is reasonably practicable to do so.

Your main duty is to avoid lifting operations that involve a risk of injury. Where it is not practicable to do this you should assess each lifting operation and reduce the risk of injury to the lowest level reasonably practicable. As the risk of injury goes up you must look at the operation increasingly closely to make sure it has been properly assessed and the risk of injury has been reduced.

## Further reading

HSE's website on musculoskeletal disorders: [www.hse.gov.uk/msd](http://www.hse.gov.uk/msd)

*Manual handling. Manual Handling Operations Regulations 1992 (as amended).*  
*Guidance on Regulations L23* (Third edition) HSE Books 2004  
ISBN 0 7176 2823 X

This booklet gives comprehensive guidance, including:

- the full text of the Manual Handling Operations Regulations 1992 (as amended in 2002) with detailed advice on each regulation;
- guidelines for assessing risk while lifting, carrying, pushing and pulling, and handling while seated;
- practical advice on measures to reduce the risk of injury; and
- an example of an assessment checklist.

*Manual handling: Solutions you can handle* HSG115 HSE Books 1994  
ISBN 0 7176 0693 7

*A pain in your workplace? Ergonomic problems and solutions* HSG121  
HSE Books 1994 ISBN 0 7176 0668 6

## Further information

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**This leaflet contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.**

This leaflet is available in priced packs of 10 from HSE Books,  
ISBN 0 7176 2828 0. Single free copies are also available from HSE Books.

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