





Hello,

Thank you for choosing Healthier Business Group to conduct your Online Training.

Please see the next slide to see what you will require before starting your training. We will also give you a few handy tips on some of the additional features that assist you with your learning.



## **BEFORE BEGINNING**

○ If you are using a mobile device or laptop, please ensure that it is fully charged.



○ You should also have a pen and notepad ready.



○ Ensure you are in a quiet area with minimal distractions.



In addition to the above please make yourself familiar with some of the tools available above such as;

### **Resource Bank**

Here you will find useful documents that will be relevant to the course you are undertaking but also you will have access to a CPD reflective learning template which you can download and complete to gain your points.

### **Highlighter/Pen tool**

This feature allows to highlight, circle and write notes on parts of the material wherever you feel necessary.

### **Presenter Function**

Selecting this function will give you instant access to our contact details without having to leave the course should you require support with the system or any assistance from one of our qualified trainers.

### **Audio Dictation**

Please note this feature is auto-enabled. If this isn't required simply select the mute function or decrease the volume.

### **Hyperlinks**

Should you click on a hyperlink within the course material you will be required to click your back button on your browser or device once you are ready to resume.

## INTRODUCTION

Healthcare settings can pose significant moving and handling challenges and risks. Work-related musculoskeletal disorders, including manual handling injuries, are the most common type of occupational ill-health in the UK (Health and Safety Executive 2011). Given the nature, type and frequency of moving and handling activities undertaken, the risks of injury to staff and patients are considerable and need to be minimised. As part of health and safety at work requirements, employers are expected to provide training on key health and safety risks, and this has been supplemented with additional guidance covering the specific activity of moving and handling.

This training is a requirement for all staff including unpaid and voluntary staff groups and for those whose roles involve manual handling activities of inanimate objects and/ or people. The refresher periods for this training should be based on local assessment and in most cases practical training must be undertaken. For those who do not require practical training, this e-learning module supports the delivery of knowledge aspects and learning outcomes.

The need for updating skills or refresher training will be determined by the monitoring and assessment of the individual's competence, outcomes of any local audits and whether there are any other changes to tasks, equipment, environment or new developments in moving and handling policy and practice. One of the implications is that staff who are monitored and demonstrate currency of knowledge and practice, as relevant in their workplace, will not need to undertake refresher training unless there are changes in the circumstances such as working in a different setting as an agency worker.

At the end of this module, the learner should:

- Be able to recognise manual handling risk factors and how injuries can occur
- Understand employer's and employee's responsibilities under relevant national Health & Safety legislation including most recent versions of the Manual Handling Operation Regulations
- Understand their own responsibilities under local organisational policies for Moving and Handling
- Know where additional advice and information can be sought relating to Moving and Handling issues
- Be able to use an ergonomic approach to manual handling and other work tasks leading to improved working posture
- Understand principles of good back care to promote general musculo-skeletal health
- Understand the principles of safer handling
- Know the factors to be included in undertaking a dynamic risk assessment prior to undertaking a moving and handling activity
- Understand how the organisation uses its risk management processes to inform safe systems of work
- Be able to choose suitable risk control strategies, resources and support available to facilitate good practice following a risk assessment appropriate to the staff member's role.

## **Addition Practical Training**

Staff involved as part of their duties in the moving and handling of patients will require principle-based practical instruction on strategies and approaches for safely moving and handling patients relevant to their role in the organisation:

- Chair moves and transfers
- Bed/trolley/table moves and transfers
- Mobility
- Managing the falling/fallen patient
- Use of equipment available within the organisation, e.g. profiling beds, patient hoists and slings, bathing aids, sliding and transferring systems, small handling aids to promote independence.

### **IMPORTANT**

Training should be supported with practical instruction and competence assessment by workplace supervisors in the use of any mechanical aids provided for the undertaking of Moving and Handling tasks. Please discuss with the responsible person within your organisation/ Agency of the arrangements in place to meet the needs or function of clients/ NHS Trust. These should be determined by local risk assessment and policy.

## MANUAL HANDLING

### What is Manual Handling?

The Manual Handling Operations Regulations 1992 (as amended) (MHOR) The Regulations define manual handling as:

*"...any transporting or supporting of a load (including the lifting, putting down, pushing, pulling, carrying or moving thereof) by hand or bodily force".*

A "load" is anything, which is moveable, e.g. inanimate object, person or animal.

Incorrect manual handling is one of the most common causes of injury at work. It causes work-related musculoskeletal disorders (MSDs). The statistics which are provided by the Labour Force Survey (LFS) indicate that MSD cases, including those caused by manual handling, account for more than a third of all work-related illnesses reported each year to the enforcing authorities.

There is evidence that, as well as manual handling, other risk factors in developing MSD's include:

- Heavy manual labour,
- Awkward postures and
- A recent or existing injury



# Workplace injury

## 144

workers killed at work in 2015/16

## 621,000

estimated non-fatal injuries to workers according to self-reports from the Labour Force Survey in 2015/16

## 72,702

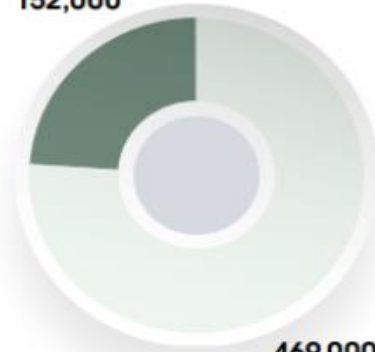
employee non-fatal injuries reported by employers under RIDDOR in 2015/16

## 4.5million

estimated working days lost due to non-fatal workplace injuries according to self-reports from the Labour Force Survey in 2015/16

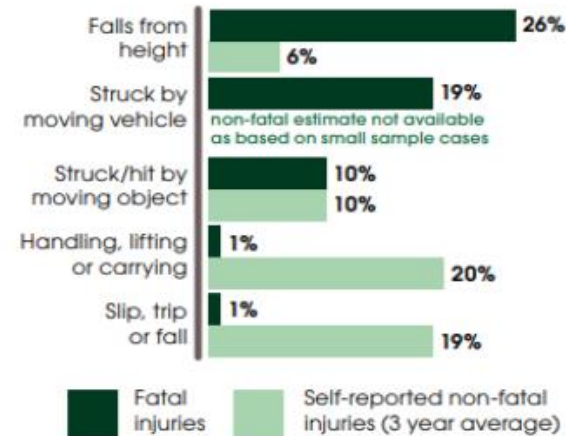
### Estimated self-reported non-fatal injuries

Injuries with over 7 day absence  
**152,000**

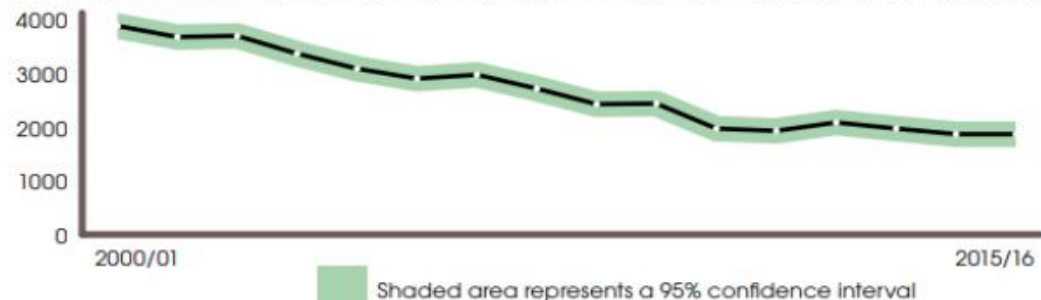


**469,000**  
injuries with up to 7 day absence

### Proportion of injuries caused by selected kinds of workplace accidents



### Rate of self-reported non-fatal injury per 100,000 workers



There has been a long-term downward trend in the rate of fatal injury, although in recent years this shows signs of levelling off.

The rate of self-reported non-fatal injury to workers showed a downward trend up to 2010/11; since then the rate has been broadly flat.

The rate of non-fatal injury to employees reported by employers (which only includes over-7-day and specified injuries) fell in 2015/16, continuing the long-term downward trend.

Find out the story behind the key figures. Visit [www.hse.gov.uk/statistics/causinj](http://www.hse.gov.uk/statistics/causinj)



## LEGISLATION

### **Health and Safety at Work etc. Act 1974**

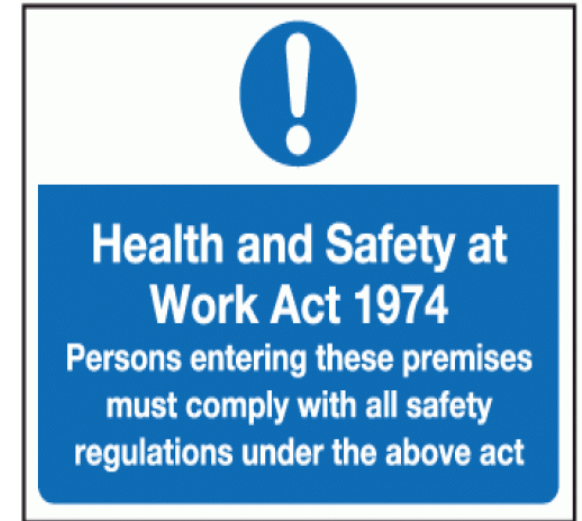
The Health and Safety at Work Act 1974 (HASW) is the primary piece of legislation covering occupational health and safety in Great Britain. Its purpose was to deliver the following recommendations:

- A single Act that covers ALL workers irrelevant of its purpose or services provided, and the Act should contain general duties which should 'influence attitudes' The Act should cover all those affected by the employer's undertaking such as contractors, visitors, students and members of the public.

There should be an emphasis on health and safety management and the development of safe systems of work. This would involve the encouragement of employee participation in accident prevention.

The HASW Act paved the way for more specific regulations to be made to accommodate changes in the world of work and encourage best practice. Below are a few of the Regulations that are likely to apply within the health and social care setting:

- The Lifting Operations and Lifting Equipment Regulations 1998
- Management of Health and Safety at Work Regulations 1999
- Manual Handling Operations Regulations 1992
- Personal Protective Equipment at Work Regulations 1992



- Provision and Use of Work Equipment Regulations (PUWER) 1998
- The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013
- Workplace (Health, Safety and Welfare) Regulations 1992

## **Section 2 of the Act– Employer’s Duties:**

The Act imposes a duty on every employer that they “shall ensure, so far as is reasonably practicable, the health, safety and welfare at work of all employees.”

Further duties include:

- Provision and maintenance of equipment
- Provide policies and procedures
- Provision of information, instruction, training and supervision of employees
- Maintaining a safe workplace, entry and exit
- Maintaining a safe and healthy working environment

## **Section 7 of the Act – Employee’s Duties:**

Employees have a general duty to take reasonable care of themselves, and of others who may be affected by their acts and omissions at work.

They have a responsibility to:

- Receive training
- To work safely
- To use equipment
- To exercise the right to refuse to carry out a task if there is no “safe system of work” in place.

It is the employee's responsibility to familiarise themselves with the organisation's Manual Handling policies and procedures and to speak to their line manager if they have any concerns. Employees can contact the Manual Handling Risk Assessment Manger within their organisation for further advice and support.

### **Section 37 and 40 – Negligence**

Where an employer is found negligent, the line manager or his equivalent is also liable and can be punished accordingly.

- If a person is accused of negligence for failure to comply with health and safety legislation, they must prove that it was not reasonably practicable to have complied.
- Failure to comply with this Act may result in criminal prosecution

## THE MANUAL HANDLING OPERATIONS REGULATIONS 1992 (MHOR)

The Manual Handling Operations Regulations 1992 were a result of the “Manual Handling of Loads – European Directive” of May 1990. A European Directive is a legal document, which means that each member state is obliged to introduce legislation to comply with the main aims of the directive. The intention is to standardise and harmonise practice throughout the European Union.

### Regulation 2 – Definitions:

*“Manual handling operations” means any transporting or supporting of a load (including the lifting, putting down, pushing, pulling, carrying or moving thereof) by hand or bodily force.”*

**Note: A “load” is anything that can be moved, e.g. inanimate object, person or animal**

### Regulation 4 – the Employer:

1. ‘So far as is reasonably practicable’, **avoid** the need for his employees to undertake any manual handling operations at work, which involve a risk of their being injured.



2. Where it is not reasonably practicable to avoid the need for his employees to undertake any manual handling at work which involves a risk of their being injured:

- I. Make a suitable and sufficient assessment of all such manual handling operations to be undertaken by them, having regard to the factors which are specified.... and considering the questions which are specified...
- II. Take appropriate steps to reduce the risk of injury to those employees arising out of their understanding any such manual handling operations to the lowest level reasonably practicable
- III. Take appropriate steps to provide any of those employees who are undertaking any such manual handling operations with general indications and, where it is reasonably practicable to do so, precise information on –
  1. The weight of the load, and
  2. The heaviest side of any load whose centre of gravity is not positioned centrally.

3. Any assessment referred to shall be reviewed by the employer who made it if:

- I. There is reason to suspect that it is no longer valid, or
- II. There has been significant change in the manual handling operations to which it relates;

The assessment requires an ergonomic approach to be adopted.....

Ergonomics is the “*science of work*” and can be described as “fitting the job to the person, rather than the person to the job.” The ergonomic approach looks at manual handling, considering the following factors:

- The nature of the **TASK**, the **LOAD**, the working **ENVIRONMENT**, the **INDIVIDUAL CAPABILITY** and the **EQUIPMENT**

## NATIONAL GUIDANCE

### Scotland:

In Scotland, the Scottish Manual Handling Passport Scheme (SMHPS) was launched as an initiative designed to improve the standard and consistency of manual handling training / education and the systems (process/procedures) that underpin it within Health Boards and Local Authorities (LA) in Scotland.

### Wales:

In January 2003, the All Wales NHS Manual Handling Training, Passport and Information Scheme was developed and launched by Health and Safety professionals within the NHS Trusts in Wales, again aimed at improving the safety of employees within the NHS.

### Northern Ireland:

- The Management of Health and Safety at Work Regulations (Northern Ireland) 2000
- Manual Handling Operations Regulations (Northern Ireland) 1992

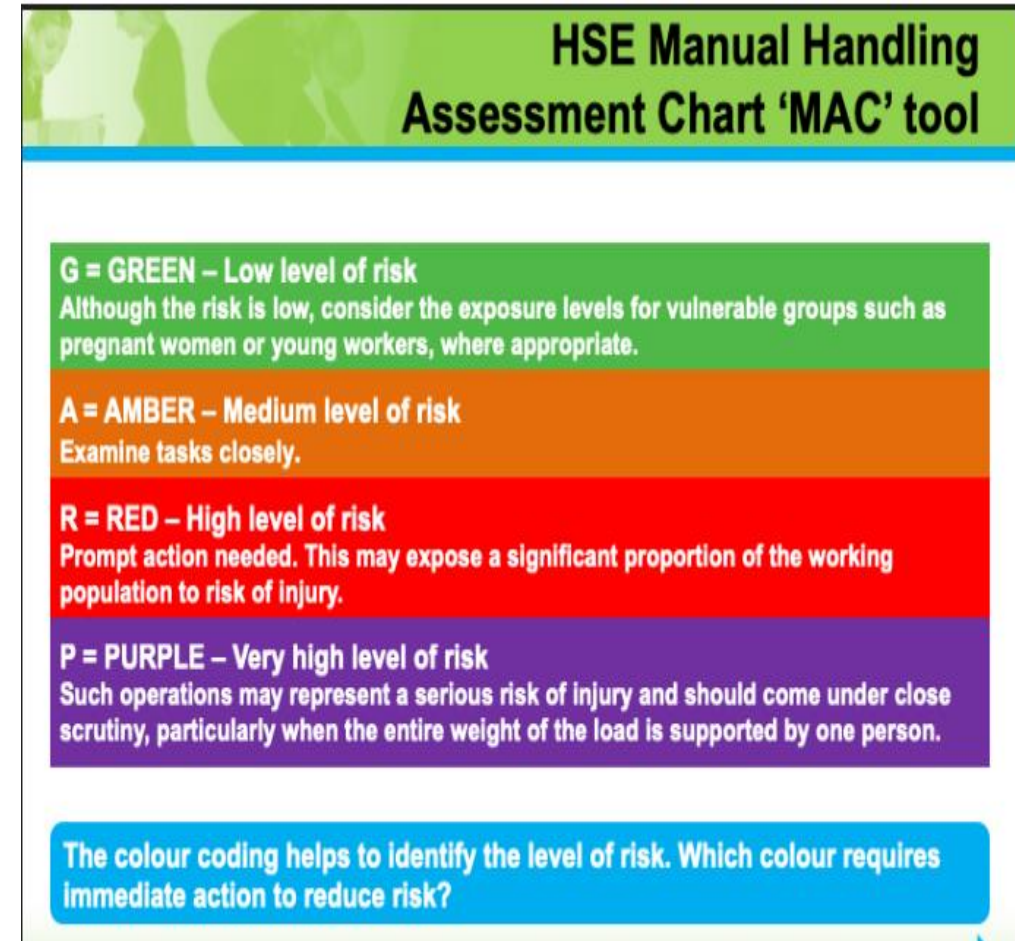
**NOTE: It is your responsibility to ensure that you adhere local policies and procedures in relation to Manual Handling in the workplace**

## THE MANUAL HANDLING ASSESSMENT CHART (MAC)

The MAC tool was developed to help the user identify high-risk workplace manual handling activities and can be used to assess the risks posed by lifting, carrying and team manual handling activities. It is designed to help you understand, interpret and categorise the level of risk of the various known risk factors associated with manual handling activities.

Manual handling injuries are part of a wider group of musculoskeletal disorders (MSDs). The term 'musculoskeletal disorders' covers any injury, damage or disorder of the joints or other tissues in the upper/lower limbs or the back. Statistics from the Labour Force Survey (LFS) indicate that MSD cases, including those caused by manual handling, account for more than a third of all work-related illnesses reported each year to the enforcing authorities.

There is evidence that, as well as manual handling, heavy manual labour, awkward postures and a recent or existing injury are all risk factors in the development of MSDs



**HSE Manual Handling Assessment Chart 'MAC' tool**

**G = GREEN – Low level of risk**  
Although the risk is low, consider the exposure levels for vulnerable groups such as pregnant women or young workers, where appropriate.

**A = AMBER – Medium level of risk**  
Examine tasks closely.

**R = RED – High level of risk**  
Prompt action needed. This may expose a significant proportion of the working population to risk of injury.

**P = PURPLE – Very high level of risk**  
Such operations may represent a serious risk of injury and should come under close scrutiny, particularly when the entire weight of the load is supported by one person.

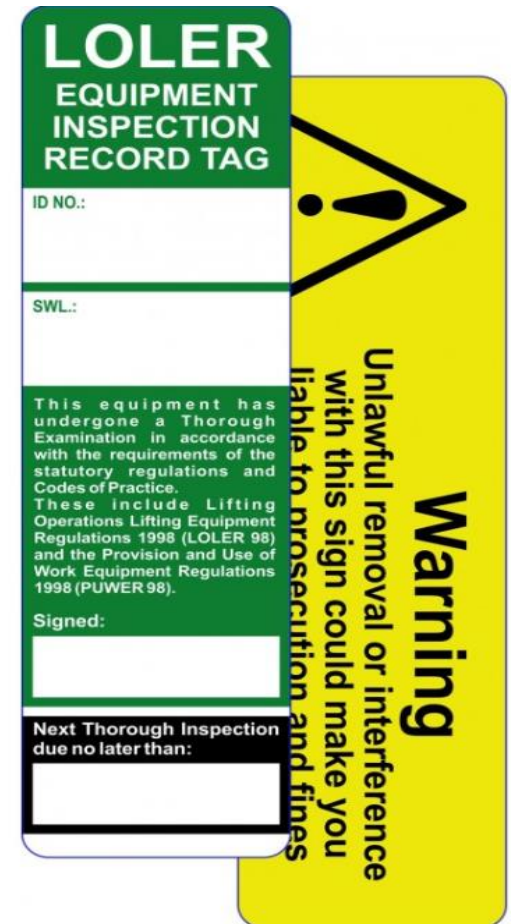
The colour coding helps to identify the level of risk. Which colour requires immediate action to reduce risk?

## THE LIFTING OPERATIONS LIFTING EQUIPMENT REGULATIONS 1998 (LOLER)

The Lifting Operations Lifting Equipment Regulations 1998 (LOLER) is a set of regulations created under the Health and Safety at Work etc. Act 1974, which came into force in Great Britain on 5 December 1998 and replaced many other pieces of legislation that covered the use of lifting equipment.

These Regulations (often abbreviated to LOLER) place duties on the people and companies who own, operate or have control over lifting equipment. This includes all businesses and organisations whose employees use lifting equipment, whether owned by them or not. In most cases, lifting equipment is also work equipment so the Provision and Use of Work Equipment Regulations (PUWER) will also apply (including inspection and maintenance). All lifting operations involving lifting equipment must be properly planned by a competent person, appropriately supervised and carried out in a safe manner.

A lifting operation is defined as ‘an operation concerned with the lifting or lowering of a load’. A load is the item or items being lifted which includes a person or people. One way to identify if LOLER applies is to apply the test of primary purpose or principal function. For example, hoists and bath hoists would be lifting equipment as the aim is to safely transfer a patient from one surface to another (bed to chair, or chair to bath). Adjustable beds or electric riser chairs would not be, as the patient will remain in situ throughout.





**LOLER** also requires that:

- All equipment used for lifting is fit for purpose,
- Appropriate for the task,
- Suitably marked and, in many cases,
- Subject to statutory periodic 'thorough examination'.
- Records must be kept of all thorough examinations and
- Any defects found must be reported to both the person responsible for the equipment and the relevant enforcing authority.
- Lifting equipment should be positioned or installed in such a way as to reduce the risk, as far as reasonably practicable, of the equipment or load striking a person, or of the load drifting, falling freely or being unintentionally released.

If you are required to undertake lifting operations or are involved providing lifting equipment for other people to use, you must manage and control risks to avoid any injury or damage. Where you undertake lifting operations involving lifting equipment you must:

- Plan them properly
- Use people who are sufficiently competent
- Supervise appropriately
- Ensure that the lifting is carried out in a safe manner

In planning any lifting operation, the identification and assessment of risk is key to identifying the most appropriate equipment and method for the job. Lifting operations range from:

- The very simple and commonplace, where minimal on-the-job planning by trained, competent people may be all that is needed to manage risk; to
- Very complex operations, which require sophisticated and detailed planning / records, with very high levels of expert input, monitoring and supervision - undertaken by specially trained personnel

## **Regulation 8 – Training and Planning of Lifting Operations**

This regulation is about making sure that the actual lifting operation is safe. It deals with what must be done before, during and after lifting to make sure that the operation is carried out without endangering anyone. It is in two parts:

Part 1 contains the main provisions;

Part 2 is a statement about what ‘lifting operations’ means.

The main requirements of part 1 are that lifting operations must be:

- Planned;
- Supervised; and
- Safe

**Regulation 8** states:

(1) Every employer shall ensure that every lifting operation involving lifting equipment is –

- (a) Properly planned by a competent person;
- (b) Appropriately supervised; and
- (c) Carried out in a safe manner.

(2) In this regulation “lifting operation” means an operation concerned with the lifting or lowering of a load.

## Regulation 9 – Thorough examination and inspection

Regulation 9 concerns the thorough examination of lifting equipment: the detailed and specialised examination by a competent person. The examination required by this regulation is similar to thorough examinations required by previous sector specific legislation such as the Factories Act 1961.

The regulation is in seven parts.

Parts 1–4 contain the main provisions for the thorough examination of lifting equipment:

- Before it is put into service for the first time;
- After installation or reassembly;
- During its exposure to conditions which cause deterioration; AND
- Of the requirement for evidence of the last such examination when the equipment is used outside the undertaking.

Parts 5–7 deal with exclusions and matters relating to previous regulations.

Employers must ensure that lifting equipment that is exposed conditions causing deterioration and which is liable to result in dangerous situations is:

1. Thoroughly examined –
  - a) In the case of lifting equipment for lifting persons or an accessory for lifting, at least every six months;
  - b) In the case of other lifting equipment, at least every twelve months; or
  - c) In either case, in accordance with an examination scheme; and
  - d) Each time that exceptional circumstances which are liable to jeopardise the safety of the lifting equipment, have occurred; and;
2. If appropriate for the purpose, is inspected by a **competent person** at suitable intervals between thorough examinations.

Important: Thorough examination should be undertaken by a competent person. Any defects must be reported. Records of examinations should be kept for inspection purposes. The competent person is defined as having adequate training and experience or knowledge and other qualities to enable him to properly assist in the undertaking

**LOLER** regulations can be sourced directly from the HSE website, available: <http://www.hse.gov.uk/pUbns/priced/loler.pdf>

## THE MANAGEMENT OF HEALTH AND SAFETY AT WORK REGULATIONS 1999

The Management of Health and Safety at Work Regulations 1999 (the Management Regulations) generally make more explicit what employers are required to do to manage health and safety under the Health and Safety at Work Act etc. 1974.

Like the Act, they apply to every work activity. The main requirement on employers is to carry out a risk assessment. Employers with five or more employees are legally required to record the significant findings of the risk assessment.

Besides carrying out a risk assessment, employers also need to:

- Make arrangements for implementing the health and safety measures identified as necessary by the risk assessment;
- Appoint competent people (often themselves or company colleagues) to help them to implement the arrangements;
- Set up emergency procedures;
- Provide clear information and training to employees;
- Work together with other employers sharing the same workplace.

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- Provide clear information and training to employees;
- Work together with other employers sharing the same workplace.

### **New staff induction**

- New staff should have their manual handling knowledge and training accessed as part of their induction, which should occur prior to, or shortly after commencing their employment. After the needs analysis has been carried out a training schedule should then be put in place. It is good practice to individually risk assess new staff or existing employees undertaking a new role as soon as possible by a competent person as required under the Management of Health at Work Regulations 1999, amended 2006. (NHS employers, 2009)

## PROVISION AND USE OF WORK EQUIPMENT REGULATIONS 1998 (PUWER) (1999 IN NORTHERN IRELAND)

The Provision and Use of Work Equipment Regulations 1998 (PUWER), places legal duties on individuals and companies who own, operate or have control over work equipment. This includes any appliances or equipment that have been brought into the workplace by employees such as laptops or health surveillance equipment.

PUWER requires that ALL equipment provided for use at work be:

- Suitable for the intended use
- Is safe for use and is maintained in a safe condition
- Inspected to ensure it is correctly installed and does not subsequently deteriorate
- Used only by people who have received adequate information, instruction and/or training
- Accompanied by suitable health and safety measures, such as protective devices and controls, including e.g. emergency stop devices, adequate means of isolation from sources of energy, clearly visible markings and warning devices
- Used in accordance with specific requirements, for mobile work equipment and power presses

### **Regulation 3:**

*“Every employer shall ensure that work equipment is maintained in an efficient state, in efficient working order and in good repair. ...(And) shall ensure that where any machinery has a maintenance log, the log is kept up to date.”*

#### **Regulation 4:**

“Every employer shall ensure that work equipment is used only for operations for which and under conditions for which it is suitable.”

(Suitability means: “suitability in any respect which it is reasonably foreseeable will affect the health or safety of any person.”)

They also impose duties on the employers providing information, instruction and training for people who use work equipment.

#### **Regulation 8:**

*“Every employer shall ensure that all persons who use work equipment (or supervise the use of) have available to them adequate health and safety information and, where appropriate, written instructions pertaining to the use of the work equipment.”*

#### **Regulation 9:**

*“Every employer shall ensure that all persons who use work equipment (or supervise the use of) have received adequate training for purposes of health and safety; including training in the methods which may be adopted when using the work equipment, any risks which such use may entail and precautions to be taken.”*

Whilst there are no specific requirements under these regulations to conduct risk assessments, the employer still has a legal duty to ensure any hazards and risks associated with using such equipment, are identified and appropriate measures are put in place, as stipulated under the Management of Health and Safety at Work Regulations 1999.



## THE ANATOMY OF THE SPINE

The spine is made up of complex structures including 33 vertebrae, discs, muscles, tendons, nerves and the spinal column. It is divided into 5 main sections:

1. Cervical
2. Thoracic
3. Lumbar
4. Sacrum
5. Coccyx

**Facet Joints** – Link the vertebrae together and limit the movement.

**Intervertebral discs** – In between each vertebra there are discs which act as “shock absorbers” to help evenly distribute weight and ease movement between the joints. Each disc is made up of a fibrous ring of cartilage with a fluid nucleus centre. They allow free movement. The intervertebral discs are made up of a strong fibrous layer called the annulus and a soft jelly like inner layer called the nucleus.

**Muscles** – Support the spine in the upright position, produce and control movement.

**Ligaments** – Hold the bones together and add to the stability of the spine.

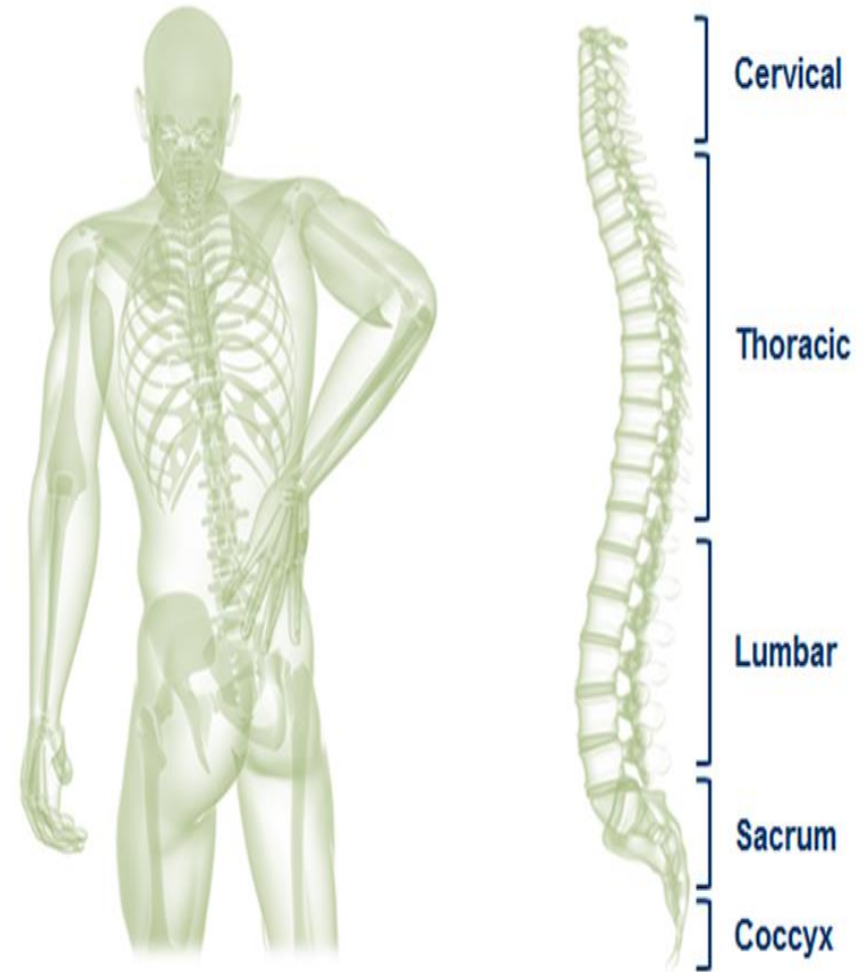
**The Spinal Cord** – Passes down through the middle of the spinal column in the spinal canal where it is protected by the vertebrae.

**Spinal Nerves** – Branch off at each level of the vertebral column and carry nerve impulses (sensory and motor) to and from the various body structures. The most common areas for injuries to occur are the Cervical and Lumbar regions with the most common injuries being to the soft tissues, muscles and ligaments.

The most vulnerable areas of the spine are the lumbar (lower back), and the cervical (neck) regions. They are the most mobile, and susceptible to injury. The lower back is also the main weight bearing part of the spine. The spine is supported by muscles and ligaments. The trunk muscles are postural muscles and are not as strong as the muscles found in the arms and legs.

There are many causes of pain and discomfort but can be broadly divided into 2 groups...

1. problems with the bony structures of the spine, and
2. problems with the soft tissues the muscles, ligaments and the discs.



## 'SLIPPED/ HERNIATED DISCS'

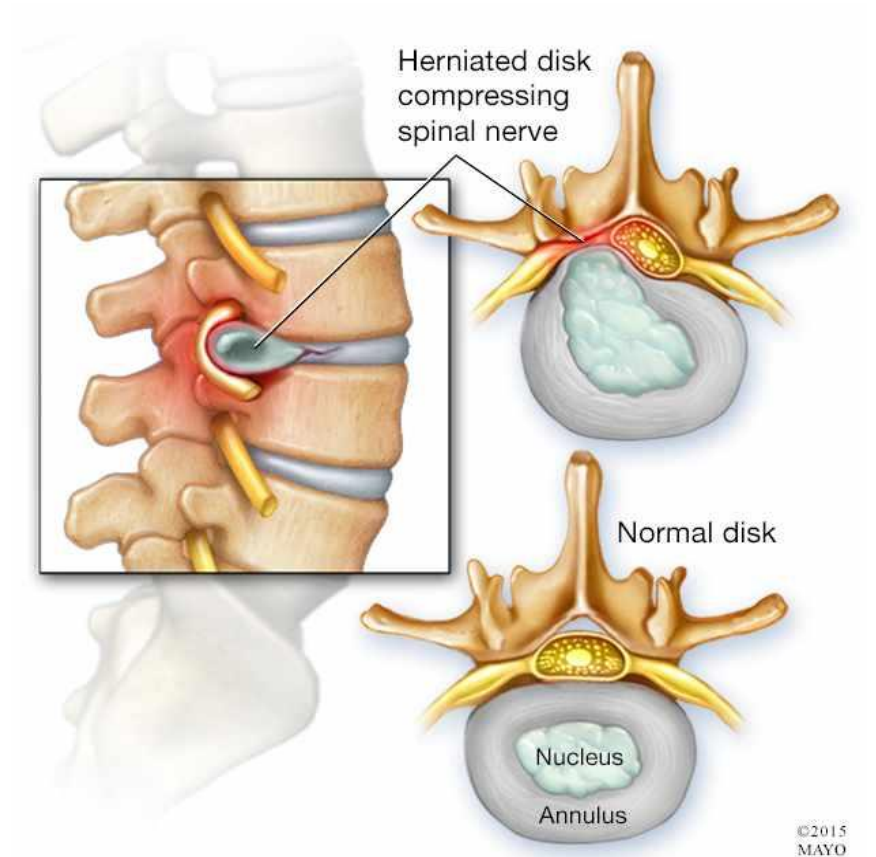
A slipped disc (also called a prolapsed or herniated disc) occurs when the outer case of the disc ruptures (splits), resulting in the gel inside bulging and protruding out of the disc.

Symptoms of a slipped disc may include:

- Lower back pain
- Numbness or tingling in your shoulders, back, arms, hands, legs or feet
- Neck pain
- Problems bending or straightening your back
- Muscle weakness
- Pain in the buttocks, hips or legs if the disc is pressing on the sciatic nerve (sciatica)

There are a number of other factors that can put increased pressure and strain on your spine. These include:

- Bending awkwardly
- Jobs that involve heavy or awkward lifting
- Jobs that involve lots of sitting



## POSTURE

Correct posture is essential for everyone, it brings with it many advantages, particularly to the spine because it:

- Re-aligns the spine, keeps the weight bearing stresses through the bodies of the vertebrae and the intervertebral discs as even as possible.
- Causes less weight bearing stresses on the soft tissues of the spine, the muscles and ligaments, which are not designed to be over-stretched.
- Maintains a good head position, particularly important if the person works in a sitting position, as there is less stress on the neck and upper limbs.
- Good posture encourages a healthy spine and goes some way to reducing the risk of injury to the spine.

Poor posture, standing or sitting in a slumped position, results in:

- Mechanical damage to the soft tissues of the spine – the discs, muscles and ligaments.
- Increasing fatigue in these soft tissues.
- Herniation of the discs – a “slipped disc”.

Good posture can be attained by:

- Making the effort to sit and stand correctly
- Regularly changing position – standing, walking and stretching the spine
- Working at the correct height for the particular task to be carried out
- Adjusting seating, if available, for the individual
- Wearing appropriate footwear

## ERGONOMIC APPROACH TO MANUAL HANDLING

It is essential that all manual handling tasks are carried out with health and safety in mind. This means taking an ergonomic approach to manual handling. Safe manual handling is not simply determined by the weight being handled. An “ergonomic” approach to assessing the safety of the handling operation is advocated, in which the contributory factors include:

**TASK** – e.g. duration and frequency

**INDIVIDUAL** capability – e.g. age & strength

**LOAD** – e.g. shape / weight

**ENVIRONMENT** – e.g. confined spaces, steps

Where possible, you should avoid all heavy and awkward manual handling tasks. Providing manual handling training is essential but will not eliminate potential risks alone. The acronym T.I.L.E. summarises these risk factors. The overall approach to risk management should be outlined in the manual handling policy and be included in the safety statement.

There are additional ways in which to reduce the risk:

1st- If dealing with service users, always encourage them to do as much as possible for themselves

2nd- Use manual handling equipment, including hoist and;

**THE VERY LAST OPTION....** Only when there is no other option, use correct manual handling

## BIOMECHANICS

Biomechanics is defined as:

‘the science of movement of a living body, including how muscles, bones, tendons, and ligaments work together to produce movement. Biomechanics is part of the larger field of kinesiology, specifically focusing on the mechanics of the movement. It is both a basic and applied science, encompassing research and practical use of its findings.....includes not only the structure of bones and muscles and the movement they can produce, but also the mechanics of blood circulation, renal function, and other body functions. The American Society of Biomechanics says that biomechanics represents the broad interplay between mechanics and biological systems. Biomechanics studies not only the human body but also animals and even extends to plants and the mechanical workings of cells.’ (Verywell Fit, 2019)

There are 3 principles to biomechanics:

### **1. Use the centre of gravity**

Everything has a centre of gravity, which is the point where the total mass of the object is concentrated. In an object, such as a box or cylinder, this is quite straightforward to calculate. However, the human body is capable of changing dimension at will. Therefore, the centre of gravity will alter according to position and sometimes move outside of the body. When we are stood upright with our hands by our sides our centre of gravity lies within the pelvis.

The further away from the body that our centre of gravity is, more effort is needed to keep our body stable e.g. if we are stood with our hands up above our head, this makes the centre of gravity rise making our body less stable. The lower the centre of gravity is to the floor, the more stable we become. If we are stood up, we can lower our centre of gravity by bending our knees and this will increase our stability, which is particularly useful when we are moving a load

## **2. Use a stable base of support**

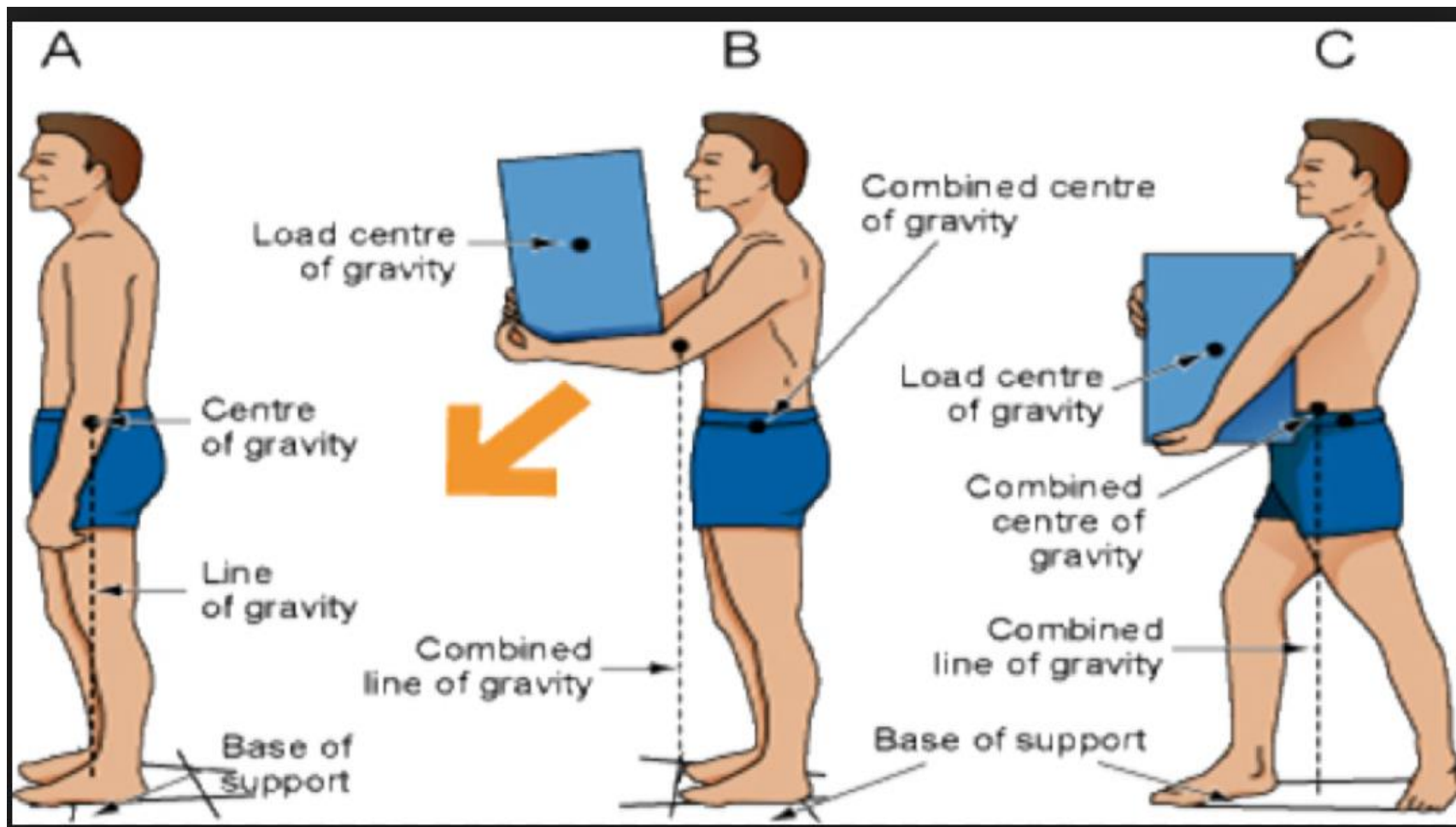
For a body to remain stable it must retain the line of gravity within its base. The person who is stood upright has a base, which is the feet and the area between the feet. When we are stood with our feet together, we render ourselves with a small base of support and a relatively high centre of gravity, which is not a stable position. In order to improve stability, we should stand with our feet apart and our knees slightly bent – this widens our base and lowers the centre of gravity.

## **3. Avoid Tension and Keep External Levers Short**

When we lean forwards our centre of gravity moves forward and the line of gravity falls outside the base rendering the body unstable. To compensate for this, our internal muscles, spinal discs and back ligaments come under extreme pressure to stop us from falling over.

If we maintained this position for any length of time, these structures will become fatigued and may recruit help from other groups of muscles – the body is now in a state of tension. If a person now wants to move a load only the peripheral muscles in the arm are available to assist in the effort of moving.

Therefore, the length of the external lever (i.e. the arms) should be reduced. This can be done by spreading the feet to widen the base and bending the legs to stabilise the base and lower the centre of gravity – this means that the line of gravity will be kept in the area of support and the body will remain stable.





Manual handling principles can use the **SMART** approach.

**S** - size of the load

**M** - move in close to the load

**A** - always bend your knees

**R** - raise the object with your knees

**T** - turn by moving your feet

### Changing the load (inanimate objects)

- Reduce the size of the load (split it or see if it's available in smaller quantities). Ask... can it be made lighter?
- Make it easier to grip- handles, hooks, straps
- Stabilise it - prevent sudden movements
- Cover any sharp edges, (so it's easy to hold close to you and avoids injury)

### Changing the work area

- Assess whether you can eliminate / reduce the handling requirement
- Improve lighting
- Change the height of surfaces so that loads are picked up and put down at more convenient heights
- Make the floor surface as even and uncluttered as possible. Avoid having to negotiate stairs
- Avoid awkward tight spaces
- Temperature/humidity
- Noise levels

## HANDLING AIDS

Appropriate handling aids such as scissor lifts, trolleys, sack trucks, vacuum lifts, and weight sensitive loaders can all help to reduce the risk.

### **Individual Capability of the person/persons performing the task:**

- Staffing levels
- Staffing ratios
- Training – adequate and assessed
- Experience
- Health status – has there been previous injury
- Pregnancy
- Age of staff
- Shift patterns
- Adequate rest breaks
- Return to work policy following sickness or injury Height/shape/size
- Vulnerability – students or new starters
- Adequate induction
- Individual capability – strength, physical fitness, stamina.

## THE TASK

- Contribution of patient
- Need for the task
- Frequency
- Duration
- Repetition
- Static postures – e.g. holding limbs for a long period of time.
- Reaching
- Pushing
- Pulling
- Twisting
- Stooping
- Awkward postures

## RISK ASSESSMENT

As part of managing the health and safety of any organisation, it is a legal requirement for all employers to identify what potential hazards might cause harm in the workplace and decide whether reasonable steps and action can be taken to prevent that harm. This is often referred to as a 'risk assessment' or an assessment of 'risk management'.

HSE defines a risk assessment as:

*“A careful examination of what in your workplace could cause harm to people so that you can weigh up whether you have taken enough precautions or should do more to prevent them.”*



## DEFINITIONS

<b>Health:</b>	A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO, 1948)
<b>Safety:</b>	Protection of people from physical and mental injury/illness
<b>Hazard:</b>	Anything that may cause harm. (Examples include chemicals, electricity, people, working from a ladder etc.)
<b>Risk:</b>	The likelihood of a substance, activity or process to cause harm.
<b>Harm:</b>	The physical injury to you or others or the damage to equipment that could result from an accident
<b>Likelihood:</b>	Probability of the hazard causing harm
<b>Consequence:</b>	How serious the outcome or harm would be if you were involved in an accident

Organisations should measure, monitor and evaluate safety and health performance. Performance can be measured against agreed standards to reveal when and where improvement is needed. Active self-monitoring reveals how effectively the safety and health management system is functioning.

If controls fail, reactive monitoring should find out why they failed, by investigating the accidents, ill health or incidents, which could have caused harm or loss. The objectives of active and reactive monitoring are:

- To determine the immediate causes of substandard performance
- To identify any underlying causes and implications for the design and operation of the safety and health management system.

Employers need to ensure that the findings of risk assessments are shared with employees but more importantly opportunities are given to share the resulting changes required in practices or procedures. If you do not know where to access the risk assessment, policy or procedure, you can ask your employer.

The HSA (Health and Safety Authority) advises that organisations achieving high standards of safety and health should develop policies that recognise the following:

- Contribution that safety and health can make to business performance by preserving and developing human and physical resources, by reducing costs and liabilities, and by expressing corporate responsibility.
- Need for leaders to develop appropriate organisational structures and a culture that supports risk control and secures the full participation of all members of the organisation.
- Requirement to resource and plan policy implementation adequately.
- Necessity of approaching injury, ill health and loss prevention by systematically identifying hazards, assessing and controlling risks.
- Need for the organisation to develop an understanding of risks and risk control and to be responsive to internal and external change.
- Requirement to scrutinise and review performance to learn from experience.
- Connection between quality, the environment, safety and health, and good management practice.

## 5 - STEPS GUIDE TO RISK MANAGEMENT



## **STEP ONE: IDENTIFY THE POTENTIAL HAZARD IN THE WORKPLACE**

Risk Assessments are conducted to **IDENTIFY** hazards that may cause harm or injury.

## **STEP TWO: DECIDE WHO THE HAZARD CAN AFFECT AND WHY**

Consider which group of workers (or others who may not be on the premises at all times, such as contractors/visitors) could be harmed with the identified hazard and the risk this potentially imposes on them. Discuss with colleagues/other workers how such hazards can have an impact on them or others.

## **STEP THREE: EVALUATE THE RISK:**

Having identified the hazards, decide how likely it is that harm will occur; and has the business put in place preventative measures that are 'reasonably practicable'. This means balancing the level of risk against the measures needed to control the real risk in terms of money, time or trouble. However, action may not be taken should it be grossly disproportionate to the level of risk.

### **Questions to ask:**

Can I get rid of the hazard altogether?

Can you implement controlled measures that are reasonable and realistic?

If not, how can I control the risks so that harm is unlikely?

Control measures that can be considered include:

- 1) Separate the person from the hazard
- 2) Eliminate the hazard completely
- 3) Replace with a less hazardous risk
- 4) Use Personal Protective Equipment (PPE)
- 5) Document procedures and methods that can be implemented to reduce exposure to risk identified



## **STEP FOUR: RECORD YOUR FINDINGS:**

Make a record of your significant findings - the hazards, how people might be harmed by them and what you have in place to control the risks. Any record produced should be simple and focused on controls.

A risk assessment must be 'suitable and sufficient', i.e. it should show that:

- A proper check was made
- You asked who might be affected
- You dealt with all the obvious significant hazards, considering the number of people who could be involved
- The precautions are reasonable, and the remaining risk is low
- You involved your employees or their representatives in the process

## **STEP FIVE: REVIEW YOUR RISK ASSESSMENT AND UPDATE IF NECESSARY**

Few workplaces stay the same, so it makes sense to review what you are doing on an on-going basis, look at your risk assessment again and ask yourself:

- Have there been any significant changes?
- Are there improvements you still need to make?
- Have you learnt anything from accidents or near misses?
- Make sure your risk assessment stays up to date.

Assessing risk is part of making the workplace safer and everybody can contribute. Your organisation should have a risk management matrix to assist in risk assessment as part of their risk management process.

## HOW TO LIFT HEAVY OBJECTS

Always keep your back as straight as possible:

- Make sure you are standing directly in front of the item you wish to lift.
- Check if the item has handles that you could use.
- Know where you are taking the object before you begin.
- Position your feet evenly (shoulder width apart).
- Keep your back straight and stand up tall.
- Tighten your stomach muscles.
- Squat to the floor by bending your knees – refrain from moving your upper body.
- Take hold of the object firmly with both hands.
- Distribute the weight evenly – make sure you are not unbalanced.
- Keeping the object close to your body, begin to stand up by straightening your legs (this will use your leg muscles and shouldn't put strain on other areas).
- Stand up slowly. Do not move quickly or make a sudden movement when doing this.
- You can now walk with the object, but be careful not to twist your body unnecessarily. Take small steps if possible.
- If you are carrying a large object that restricts your view, ask if someone can guide you. This will prevent you from tripping or bumping into objects.
- When placing the item down, bend your legs.
- Remember to keep your back straight as you bend down again.
- Be careful to lower each side of the object to the floor separately – this will avoid trapping your fingers under the weight the height that you will be lifting and the distance you will be required to carry the object



**1** The first thing to do before lifting a box or a similar load is to estimate the weight. Stand close to and right in front of what you plan to lift, with your legs wide apart.



**2** Keep your back straight, bend your knees and flex your hips.



**3** Take hold of what is to be lifted, stretch your legs, flex your hips and carry the load close to your body.

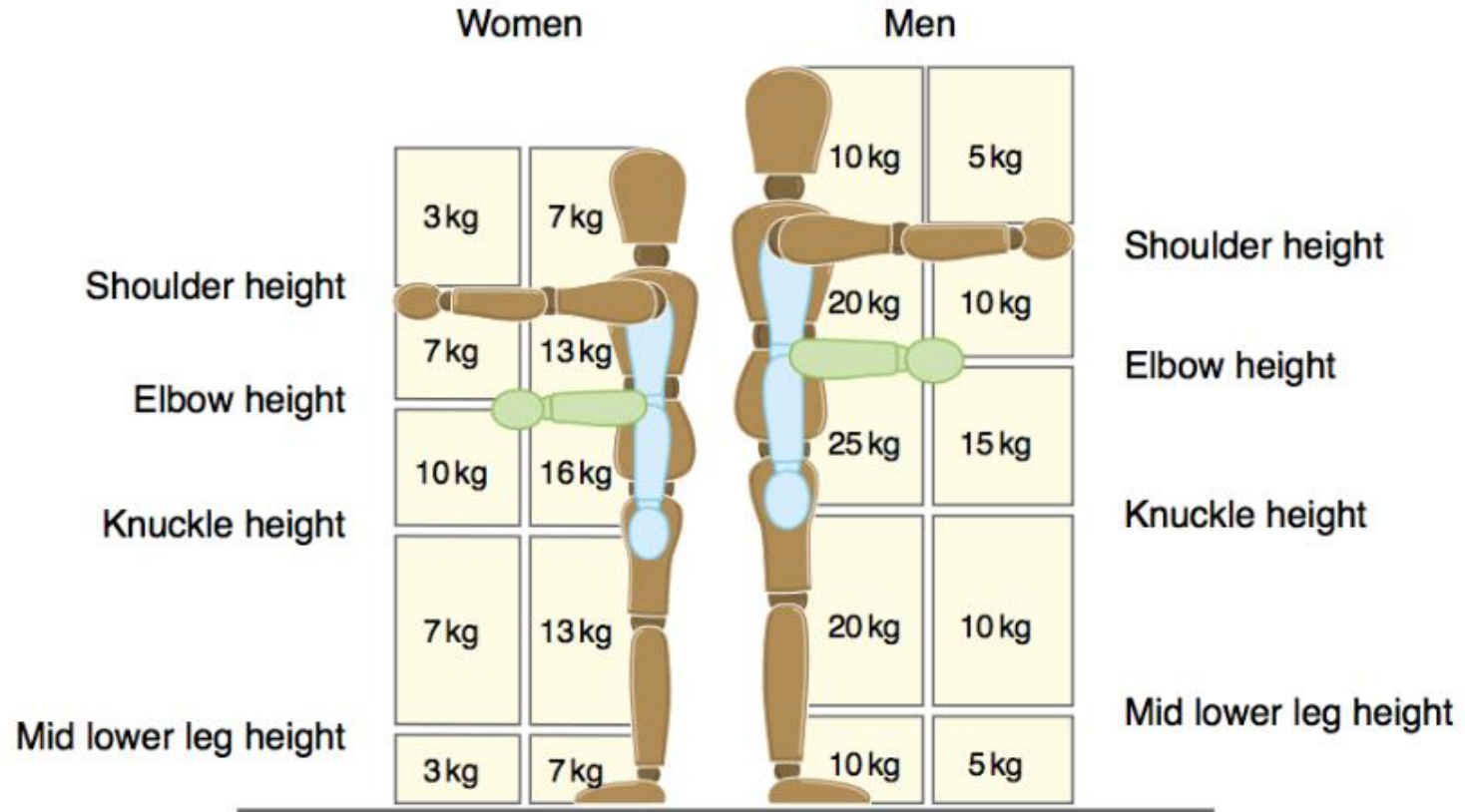


**4** Lift straight up, remembering not to turn your body while you are lifting.



**5** Employ a similar technique when you set down the object. Bend your knees and flex your hips, keep your back straight.

# HOW MUCH WEIGHT IS SAFE TO LIFT AND CARRY AT WORK?



## Team Moving and Handling Tasks

Large heavy or awkward loads may require more than one person to move it. When more than one person is doing the task, there are a few extra things to bear in mind.

- Decide who the caller will be. This will be the person who co-ordinates the move using clear commands e.g. **Ready, Steady, Move.**
- Can everyone do their bit, or will one person let you down jeopardising the safety of the others? Consider everyone's capabilities.
- Plan and discuss how this task will be done.
- Think about the route; are there doors or awkward steps etc.?
- Discuss what is expected of each person.
- Apply the principles as above.
- Select a team leader to co-ordinate the task with all team members.
- Do not rush and allow rest periods during the move according to the needs of the weakest person

