

Lighten the Load

Information for employers and workers
of the **construction sector**



www.handlingloads.eu

European inspection and communication campaign
Manual Handling of Loads 2008



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www.hsa.ie

1. Why do we need to manage manual handling?

Do not let your back be a burden to you!

In Europe – about 24% of workers suffer from back pain, while 22% complain of other muscle disorders. In the new Member States these disorders happen even more often, 39% and 36%, respectively.

About 50% of early retirements in Europe are caused by pathological changes in the back. 15% of cases of inability to work are connected with back injuries. This kind of disorder constitutes one of the major causes of absence at work in most of the EU Member States. They are not only the cause of suffering, disability to work and loss of workers' income but also of high costs incurred both by employers and national economies¹.

According to European statistics, 62% of workers in the EU27 are exposed a quarter of the time or more to repetitive hand and arm movements, 46% to painful or tiring positions and 35% to carrying or moving heavy loads.

Costs to the worker:

- Worsening health condition,
- Lower efficiency and poor quality of work – possibility of losing a job,
- A threat to material situation of a worker and his family,
- Suffering – life in continuous pain reduces life satisfaction,
- Disability – stigmatisation and feeling of being a burden to an employer, family and society,
- Social isolation.

¹ European Survey of Working Conditions, European Foundation for the Improvement of Living and Working Conditions, 2005

Costs to the employer:

- Lower efficiency and poor quality of work by affected workers,
- More frequent absenteeism of workers at work,
- Costs of sick leave,
- Organisational problems – lack of qualified staff,
- Costs of training of new staff,
- Costs of accidents at work,
- Loss of time – loss of profits.

Costs for the national economy (social costs):

- Costs of additional health care for suffering workers,
- Costs of compensation for accidents at work,
- Costs of pension or other social benefits due to disability and occupational illnesses,
- Loss of capable, qualified workers – losing their potential, knowledge, professional skills – so called interruption of social cohesion,
- Costs of occupational rehabilitation of disabled persons.

It is estimated, that total costs of national economy amount to 0,5% - 2% GDP.

2. The goals and target audience of the campaign

Encouraging changes in the behaviour of workers and stimulation of employers to undertake action aimed at protection of workers health, can be of paramount importance for the economic results of enterprises as well as for the development of societies. The basic way to successfully prevent occupational risk is to implement solutions for the improvement of safety and health at work by means of effective, cohesive and comprehensive legal regulations. In line with the European Commission's priorities included in the Community strategy 2007-2012 on health and safety at work, the solutions focus, in this case, on prevention of musculoskeletal disorders and injuries caused by work. SLIC, which stands for the Committee of Senior Labour Inspectors, promotes the correct and consistent implementation of community law in relation to health and safety at the workplace, and also the analysis of practical issues which come to light when monitoring the application of the relevant legislation.

In order to support this years SLIC campaign we present a brochure on the issue of the manual handling of loads.

It is aimed both at workers and employers in the construction sector. It contains examples of good practices which will facilitate creating a positive safety culture.

The objectives are:

- **To achieve greater conformity of actions with European Directive 90/269/EEC in order to reduce musculoskeletal problems in the various countries of the EU;**
- **To improve awareness among employers and workers of the risks linked to the manual handling of loads and the associated preventive measures;**
- **To promote a cultural change as regards the approach to risks linked to manual handling by tackling the problems at source and completing a risk assessment of work activities to avoid, reduce or reorganise.**

The effects of the campaign should include not only making workers and employers aware of the hazards related to the manual handling of loads, but first and foremost a sustainable change in their working habits – in the way work is planned, organised and performed. Manual handling of loads must be eliminated wherever it is possible. It can and should be eliminated e.g. by the use of mechanical aids, organizational solutions for warehousing of goods, etc. If it is absolutely necessary to handle loads manually, the work should be performed in a way safe for worker's health, in accordance with ergonomic requirements.

Avoid, reduce, reorganise

In 2008, the European communication and inspection campaign will focus on the retail trade and construction sectors and continues last year's campaign. Broadening the campaign's scope to more companies will surely enable improved implementation of best practices. The campaign activities are coordinated with the European Risk Assessment campaign conducted by the European Agency for Safety and Health at Work in Bilbao².

The construction sector was chosen as a campaign target for several reasons:

- the most frequent of the reported complaints are associated with back aches and muscle aches,
- the lowest possible level of autonomy at work (lack of worker's influence on work organisation, including choice or change of performed tasks, work pace and intervals as well as of working methods)³.

²The European Agency for Safety and Health at Work (EU-OSHA) has designed an information campaign that raises awareness on the importance of risk assessment in all EU Member States and beyond. The Healthy Workplaces campaign shows that risk assessment is key to reduce accidents and workplace illness. It encourages enterprises to properly carry out their assessment, involving everyone in the workplace and promotes successful good practices that can be adapted to other workplaces.

Backed by the EU Presidencies, Parliament, Commission and the social partners, the campaign runs for the first time on a two-year basis (2008/2009).

More on campaign available at <http://hw.osha.europa.eu>

More on risks assessment available at <http://osha.europa.eu/topics/riskassessment>

³European Survey of Working Conditions; European Foundation for the Improvement of Living and Working Conditions, 2005

The campaign applies to 'the manual handling of loads' denoting any transporting or supporting of a load, by one or more workers, including lifting, putting down, pushing, pulling, carrying or moving of load, which, by reason of its characteristics or of unfavourable ergonomic conditions, involves a risk particularly of back injury to workers⁴.



⁴The definition is derived from the Council Directive 90/269/EEC on the minimum health and safety requirements for the manual handling of loads where there is a risk particularly of back injury to workers (OJ L156, 21.6.1990, p.9)

3. Legal requirements

This incidence of musculoskeletal disorders can be reduced by organising and performing work in compliance with legislation. The main drivers for action to improve safety and the protection of workers' health at work are contained in the Framework Directive 89/391/EEC⁵. It draws one's attention to the fact that better safety, improvement of hygiene and health protection of workers at work is a goal which should not be subject only to economical considerations. Employers should have the knowledge of recent scientific and technological progress regarding design of workplaces, equipment and systems of work, taking into account the levels of risk presented.

The directive implements nine principles of prevention for occupational risks:

- avoiding risks,
- evaluating the risks which cannot be avoided,
- combating the risks at source,
- adapting the work to the individual,
- adapting to technical progress,
- replacing the dangerous by the non-dangerous or the less dangerous,
- developing a coherent overall prevention policy which covers technology, organisation of work, working conditions, social relationships and the influence of factors related to the working environment,
- giving collective protective measures priority over individual protective measures,
- giving appropriate instructions to workers.

⁵ Council Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work (OJ L183, 29.6.1989)

The minimum requirements associated with manual handling of loads are specified in Directive 90/269/EEC. According to its provisions an employer has to avoid the need for the manual handling of loads by workers (Art. 3). In the event that manual handling is unavoidable, the employer is obliged to:

- evaluate the risk,
- undertake corrective actions to reduce the risk,
- supply a workplace with technical measures,
- inform and train the worker about safe work methods.



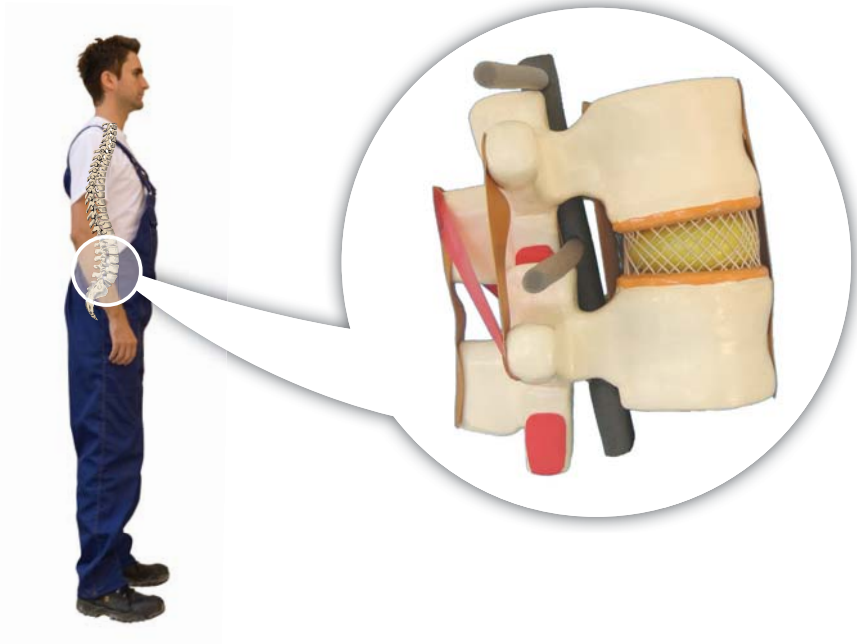
4. Which body parts can be affected as a result of manual handling of loads?

Musculoskeletal disorders resulting from manual handling of loads can affect the back and upper and lower limbs. However, this brochure will focus on the spinal column, which is in line with Directive 90/269/EEC.

What is the back made of?

The spinal column consists of 33 vertebrae (7 cervical vertebrae, 12 thoracic vertebrae, 5 lumbar vertebrae, 5 sacral vertebrae, 4 forming caudal bone) and 24 intervertebral discs.

It forms a kind of scaffolding for the body and the place where the muscles, sinews and ligaments are attached. It also provides adequate flexibility which enables mobility. The spinal cord (placed in a cord channel) and the cord's nerves which are part of a nerve system, enable mobility and transfer of information to and from the brain.



The intervertebral discs are crucial because of their functions:

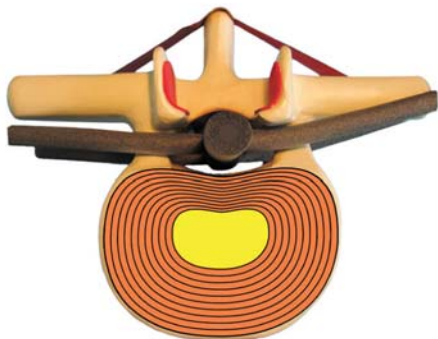
- **shock-absorbing:** a disc, which can be compared to an inflated tyre, absorbs variations in pressure,



- **ensuring mobility:** the disc facilitates bending, turning, bending back.



The disc can fulfil all these functions due to its specific construction. It consists of a nucleus which is a gelatinous substance, surrounded by a fibre ring. The ring, formed by the lattice of intersecting fibres, keeps the nucleus in central position or changes its gradient towards spinal cords resulting from pinching and stretching its parts.

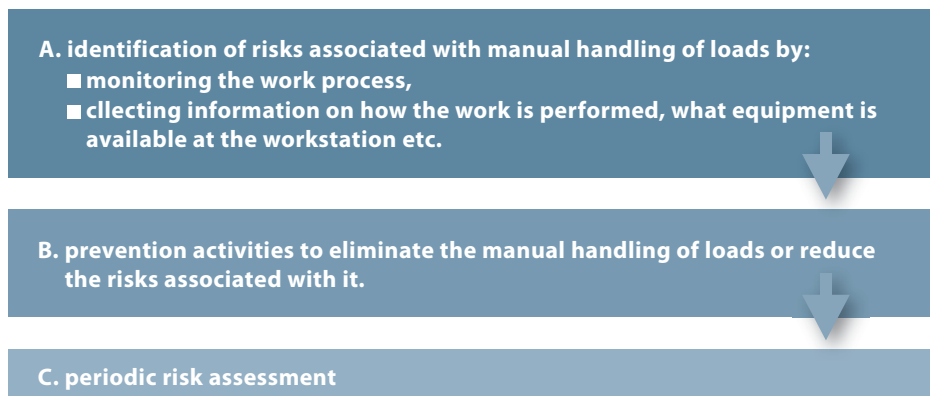


The disc has very few nerve cells and has no blood vessels. That is the reason why its nourishing (delivering vital substances and removing toxins) takes place via movement.

5. Risks related to manual handling of loads

Back injuries result from inappropriate ways of performing work. This kind of disorders arises from the handling of heavy or unwieldy loads and failure to use mechanical aids to avoid and minimise the risks associated with manual handling of loads. Awareness of these hazards is a precondition to adequate attitudes, behaviours and actions. Evaluation of occupational risk should identify hazards, and lead to the development and implementation of preventative measures. Suitable and adequate execution of risk evaluation can significantly minimise occupational risk, leading to decrease in the number of accidents at work and long term negative health effects among workers. Periodic risk evaluation should guarantee constant improvement of working conditions. Since occupational risk assessment constitutes a key element of work safety and health management, workers and employers as well as competent personnel should be engaged in the process of evaluation.

Risk assessment is a multi-phase process illustrated in the picture below:

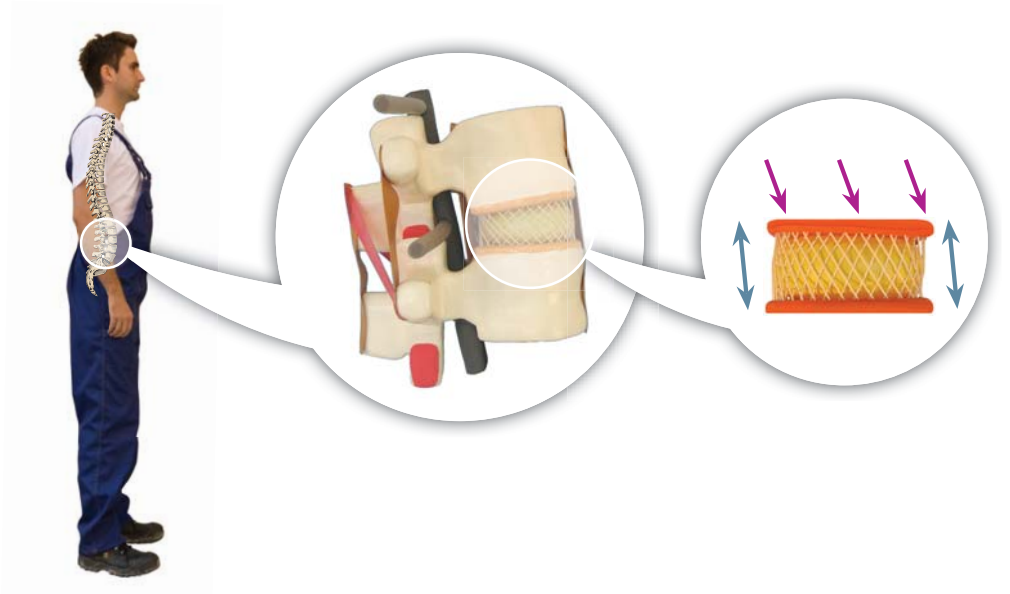


A key element in the process of risk assessment is the identification of hazards, that is to say risk factors which can cause musculoskeletal disorders. Proper and comprehensive definition of the risks will determine the protection of the health and safety of workers.

Below you will find some examples of risk factors, grouped according to their character, which workers in the construction sector are (routinely) subject to.

5.1 Risk factors resulting from the way of performing work

The most favourable body posture, with regard to loading of intervertebral discs and ligaments is standing as these structures are equally loaded. Each of activities showed below, when repeated many times or for prolonged periods of time (static posture) may be dangerous to health, in particular to lower parts of the spinal column.



Bending forward (with a rounding back)

Work in this posture causes pinching at the front of the intervertebral disc and stretching of the posterior (thinner) part of the disc. It can lead to damage of this structure. The same risks apply to excessive pace of bending activities, due to stretching of posterior ligaments.



Turning to the side while bending forward

The biggest risk for disks and ligaments comes from executing work by simultaneous twisting and bending of a torso. It results in damage of the disc due to simultaneous pinching at the front and sides of the disc as well as stretching the opposite parts.



Holding the load over a shoulder joint with simultaneous bending a torso to the rear or backwards.

A danger to discs during performance of works this way consists in pinching their posterior parts, as well as loading inter-process joints situated behind the discs. Additionally, similarly to two previous examples of postures, the one discussed at the moment involves the so called “leverage effect”. It consists in increasing pressure on the intervertebral disc while simultaneously enlarging the distance between the torso and a handled (carried) load. The bigger the distance of a load from the torso (of the same weight) the longer an arm of a pinching force, which results in increasing pressure on the disks.



Kneeling or squatting (with rounding back)

While performing work in this position, particularly for a longer period of time, without appropriate protective equipment as well as periods of rest in a different position, significant load is put not only to joints but also to muscles and heart. It is more favourable to lift the load from a squatting position due to using 4 head thigh muscles, however we have to remember not to bend legs in knee joints more than to 90°.



5.2 Risk factors resulting from the type of load handled

Excessive load weight

If the weight of a load is excessive and beyond human capability, it may pose a serious health risk. The European provisions do not explicitly stipulate the permissible values of load weights which can be transported safely. A good indicator may prove to be the model drawn up by HSE (Health and Safety Executive). In order to determine the weight of load which can be transported without causing undesirable health effects, it is advisable to consider not only the weight but also the frequency of tasks, the distance a load is to be carried, the size of the load, these can all influence the decision of the risk of the action. Weights may need to be decreased, for example by splitting the load or mechanical aids may need to be used. (more information can be found at: www.handlingloads.eu).

(In)stability of the load

An unstable load may twist around a worker’s trunk or bend, it may also cause sudden need for a worker to change their body posture or to move to keep their balance. Consequences, related to the risk of falling, for example, are self-evident. Moreover, it may negatively influence both muscular and skeletal systems leading to their significant and uneven straining. Discs and ligaments will be particularly prone to injuries when the distance of the load from the operator’s torso is significant.



■ The loading of the musculoskeletal system changes depending on the placement of the load in respect of the body. This is also influenced by external conditions (e.g. resulting from work environment or load characteristics), the frequency of relocation and employee’s individual predispositions. In this connection, it may be necessary to reduce the weight of the load in relation to 25 kg indicated here as optimal.

Elaborated based on HSE data.

If the load is too big

If the load is too big to be transported properly (that is to say as close to body as possible) musculoskeletal disorders may arise and it can particularly cause significant straining of intervertebral discs and ligaments. It may also require greater strength. If the size of the load is not adjusted to the width or height of premises through which it is transported and it restricts visibility, there is an additional risk of collision or fall.

Unwieldy load

The absence of handles may prove to be dangerous because the load may slip out of the hands, and subsequently, if the edges are sharp and contents dangerous, it may cause other serious injuries.

5.3 Risk factors resulting from the character of working environment

Not enough space for performing tasks (both vertically and horizontally)

Spatial structure of workplace determines position assumed by a worker. If there is not enough space to move the load, a worker, in order to perform his task, will assume a forced position which may cause lower back damage.

Uneven, slippery surface

Uneven surface on which the load is moved as well as its slipperiness (especially on construction sites) may cause a risk of accidents.

Too long transporting distance

If the distance over which the load is to be transported is too long, fatigue may be hastened, especially due to the length of time spent in one posture while working with the load.

Too high or too low temperature of working environment, insufficient lighting and other environmental conditions

The temperature of a working environment may have an impact on the occurrence of dangerous situations. Too high a temperature causes excessive palm sweating, which, in turn, makes it difficult to grasp the load and it is necessary to use greater force to handle it. Too low a temperature, however, causes stiffening of hands, which also makes grasping of loads difficult.

Insufficient lighting may result in difficulties in seeing the route of transporting the load, which may cause accidents. Other factors include mechanical vibrations, significant levels of dust and noise.

5.4 Risk factors related to individual characteristics of a worker

This group of factors increasing the risk of musculoskeletal disorders includes:

- a) reduced physical capability of workers resulting from their health condition, including e.g. pre-existing movement system disorders, poor fitness resulting from the lack of physical activity, age – the ability to lift loads is lower for both the young and the old,
- b) the lack of adequate preparation for the performance of manual handling activities – resulting from the fact that workers have not been trained in safe load handling techniques, they do not use handling aids, work organisation proves to be inappropriate.

6. Prevention activities

Having carefully identified the risks it is vital to determine and implement improvements in order to avoid or minimise them. Application of effective measures will reduce lower back disorders among workers.

Preventive measures may be categorized according to objectives within the Framework Directive and the 9 principles for preventing occupational risk (page no. 8 of the below paper) or according to the fields of activity related to planning, organisation of workplace and work, promotion of health at work.

6.1 Elimination of the risk

The most effective method of reducing musculoskeletal disorders is to avoid the manual handling of loads. Such activities require mechanisation or automation of tasks that may require manual handling. This, due to the need to use technical equipment e.g. lifting (crane) equipment, may increase the cost of organisation of a workplace. However, this increased cost may be offset by a reduction in the time taken, remuneration payment costs for the period of worker's sick-leave are lowered and working conditions as well as the company's image will be improved. Using lifting equipment is an example of good practice.



■ For relocation of building materials (e.g. kerbs or flagstones) one can use replaceable grabbing or pressure equipment mounted on cranes.



■ Making a narrow cut using an excavator markedly accelerates the implementation of the investment project. However, in certain conditions (e.g. near underground installations) it is impossible to use the excavator. In such a situation one should bear in mind the principles of ergonomics lessening the arduousness stemming from limited space and repeatability of manual handling of the excavated material.



■ Lifts with special fork roots are helpful while relocating loads of considerable mass for a high altitude.



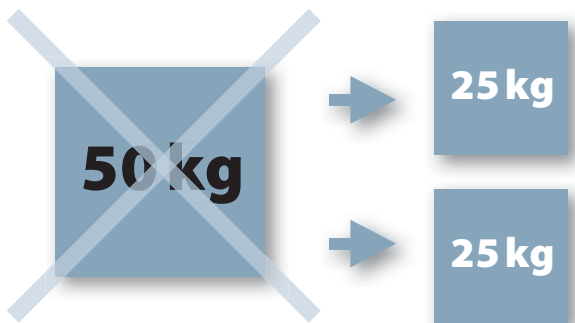
■ An electric lift mounted on the outer wall of a constructed or repaired building may be used for vertical transport of people, building materials or auxiliary equipment. It does not require any major financial outlays and it eliminates the necessity of bringing in materials to higher levels.

6.2 Reduction of the risk

Some manual handling activities may be unavoidable. In such circumstances technical or organisational measures should be applied to reduce the risk of injury. Technical measures include the use of conveyor belts, trolleys, lifts, vacuum-based lifting systems, tools (gripping devices). Organisational measures might include a change of working methods or sequence, ordering goods in more handy packaging, guaranteeing optimal rest periods at work. Some technical and organisational solutions are illustrated below.

Reducing sources of danger

A new approach to safety at work involves elimination of danger as early as in the phase of planning and designing a workplace. As an example one can quote ordering goods in handy packagings e.g. of weight ca. 25 kg, (e.g. cement, tiles) or ordering of the same goods in collective packaging adjusted to transport means at one's disposal.



Adjustment of a workplace to the needs of a worker

Workplaces should be equipped with ergonomic specially designed tools and equipment. The arrangement of a workplace should be adjusted to the type of tasks which are performed by a worker. If it is impossible to apply collective protection measures, individual protection measures should be used.



■ Protection of knees while paving.

Application of new solutions and technologies

Haste and stress result in the use of dangerous methods and technologies of work which do not comply with regulations in force and may cause injuries.

The use of handling aids when moving heavy or unwieldy goods e.g. window-panes, paving stones, etc. reduces the risk of illness and accident occurrence. Such works may involve the use of vacuum-based lifting systems, special gripping devices.



■ Manual grabs and suction caps can be used for relocating smaller objects.



■ Using auxiliary equipment (grabs) for relocating building materials relieves the employees' musculoskeletal system. However, it is necessary to keep the right position of the body.



Replacement of dangerous aspects of work with more safety

Generating and cumulating of a worker's fatigue belong to dangerous aspects of work. One basic method of preventing this phenomenon is introduction of proper intervals in the workplace. The situation is optimal when a worker can regulate the pace of work himself and have breaks whenever he feels tired. This, however, is not always possible e.g. during operation of lifting devices.

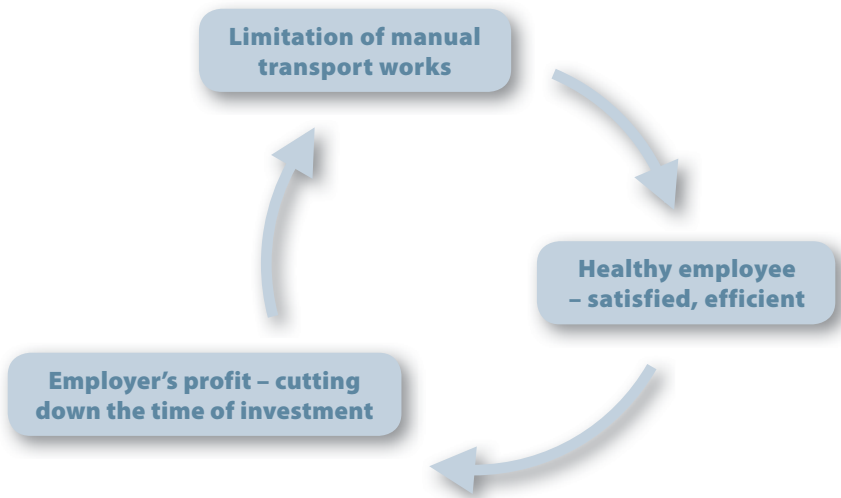
When determining the lengths of intervals at work one should consider the following:

- introduction of additional intervals at work is advisable in case there exists a straining factor of higher than medium intensity,
- the more strenuous and onerous work is, the sooner the first interval should take place,

- during afternoon and night shifts there should be more intervals than during the morning shift,
- intense pace of work should overlap with more frequent intervals⁵.

Coherent and global policy

An employer is obliged to treat work safety issues as important as the basic activity of a site. This requires a coherent and global preventive policy. Manual handling of loads should be eliminated wherever it is possible. If it is absolutely necessary to handle loads manually, the work should be performed in accordance with ergonomic requirements. The elimination or reduction of risk does not always increase an employer's costs. Below you will find a model example of preventive measures.



Instructing workers

Training a worker in the proper use of lifting aids and manual handling techniques enhances his or her knowledge and helps them realise the dangers and develop a proper attitude during work. Moreover, a worker should be informed about the features of materials to be handled (e.g. weight, centre of gravity), ergonomic

⁵ Ed. J. Indulski. *Higiena pracy*. Tom I. Wydawnictwo IMP 1999. Łódź

requirements as well as of occupational risk assessment results and safety measures against injuries. Training processes must be effective.

Promoting health at the workplace

While promoting health, employers should aim at changing the behaviours of workers who handle loads. Moreover, they should encourage workers to quit smoking tobacco, reduce excess weight. Working environment should be free from discrimination, adopted procedures should eliminate bullying and work itself should not induce stress. Promotion of health should result in what is perhaps best described by the slogan:

„A sound mind in a sound body“.

6.3 Periodic risk assessment

The aim of periodic risk assessment is constant improvement of working conditions. Periodic checkups of safety and health at work are carried out in order to identify new dangers and develop methods of dealing with them.

An additional benefit of this activity is the development of increased awareness of safety among workers as well as shaping a culture of safety. Implementation of the aforementioned is possible through introduction of changes in working processes, equipment and modes of performing tasks, preceded by the assessment of their efficiency, also in view of further risks avoidance.

7. Occupational risk assessment - summary

A. Identify and evaluate the risks

To conduct complete identification of risks and evaluation of their influence on workers' health it is necessary to:

- train individuals to conduct occupational risk assessment (knowledge of risks in the field, characteristics of work, methods of risk assessment in manual handling activities),
- observe the process of work (methods of work, working environment, load, a worker),
- identify risks, their causes and effects.

B. Prevention measures

The aim is to eliminate the risk, and if this is not possible, to reduce it, by:

- introducing mechanical equipment,
- securing proper supporting equipment for manual handling activities (lifting and handling aids),
- organising the process of the work so as to secure optimal working space and rest periods,
- integrating health and safety into the general management of the company,
- training of workers in the proper use of lifting aids and manual handling techniques
- informing workers about the characteristics of the load,
- increasing workers' knowledge about the risks associated with manual handling activities

C. Periodic risk assessment

Risk assessment conducted only once is insufficient. To prevent escalation of risk, it is necessary to conduct periodic occupational safety and health assessments. Moreover, it might be advisable to encourage workers to engage in physical activity which would improve their fitness and well-being.

8. National Contact:

Health and Safety Authority

Metropolitan Building
James Joyce Street,
Dublin 1
Ireland

Phone: (01) 6147000

Work Place Contact Unit: **wcu@hsa.ie**

There are two guidance documents available for free download from the Health and Safety Authority Website at **www.hsa.ie**

These documents are titled:

- Management of Manual Handling in the Workplace
- Ergonomics in the Workplace

A DVD is also available to purchase which describes the Manual Handling Risk Assessment process through the use of Case Studies. The DVD is titled “Manual Handling Case Studies” and is available to buy in our publications section of the website.

“Manual relocation of weights” is a two-year (2007-2008) European information-control campaign initiated by the Senior Labour Inspectors Committee. In 2008, the National Labour Inspectorate in Poland coordinates actions within the framework of the campaign.

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