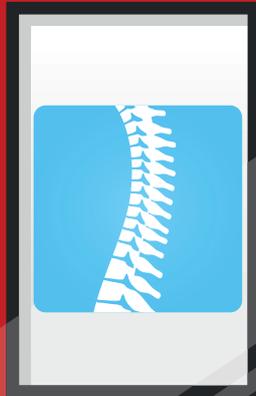




healthmanagement

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Musculoskeletal disorders (MSDs)

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THE MUSCULOSKELETAL SYSTEM

The musculoskeletal system provides support and stability to the body. When parts of the musculoskeletal system are put under repeated exposure to loads over an extended period of time, joint or muscle pain and inflammation can occur. Any posture has the potential to cause discomfort or fatigue if it is maintained for extended periods.

The musculoskeletal system

Muscles ('musculo'), which contract to produce movement.

Bones and joints ('skeletal').

Connective tissues, which protect and connect the muscles and bones:

- **Ligaments** – fibres that connect bones to bones.
- **Tendons** – connect muscles to bones and move the bones when muscles contract.
- **Cartilage** – padding that prevents friction between bones and joints.

- **Fascia** – fibrous sheets that keep groups of muscles in place.
- **Bursa** – fluid-filled sacks that prevent friction (e.g. between a bone and a tendon).
- **Intervertebral discs** – shock-absorbing cartilages that hold the vertebrae in place.

Terminology

MSDs (musculoskeletal disorders)

WRMSDs (work-related musculoskeletal disorders)

WRULDs (work-related upper limb disorders)

WRLLDs (work-related lower limb disorders)

EPISODIC

Many MSDs are **episodic**, meaning that the pain often subsides or disappears and then recurs again. However, MSDs can become chronic or irreversible.

SPECIFIC

They can be **specific**. These are progressive, clinically-diagnosed rheumatic diseases, which are not caused by work but which may be made worse by work. These conditions require clinical interventions and can have a significant impact on a person's ability to work.

Examples of specific MSDs include:

- Osteoarthritis
- Rheumatoid arthritis
- Fibromyalgia
- Carpal tunnel syndrome
- Tendonitis

NON-SPECIFIC

They can be **non-specific**. People experiencing non-specific MSDs will experience pain without any evidence of a specific disorder. They are often caused by work or made worse by work, and may be intermittent, but potentially quite severe during episodes, and can have a significant effect on a person's ability to work.

TRANSIENT

They are often **transient**, meaning that the symptoms may diminish when the aggravating activity is avoided.

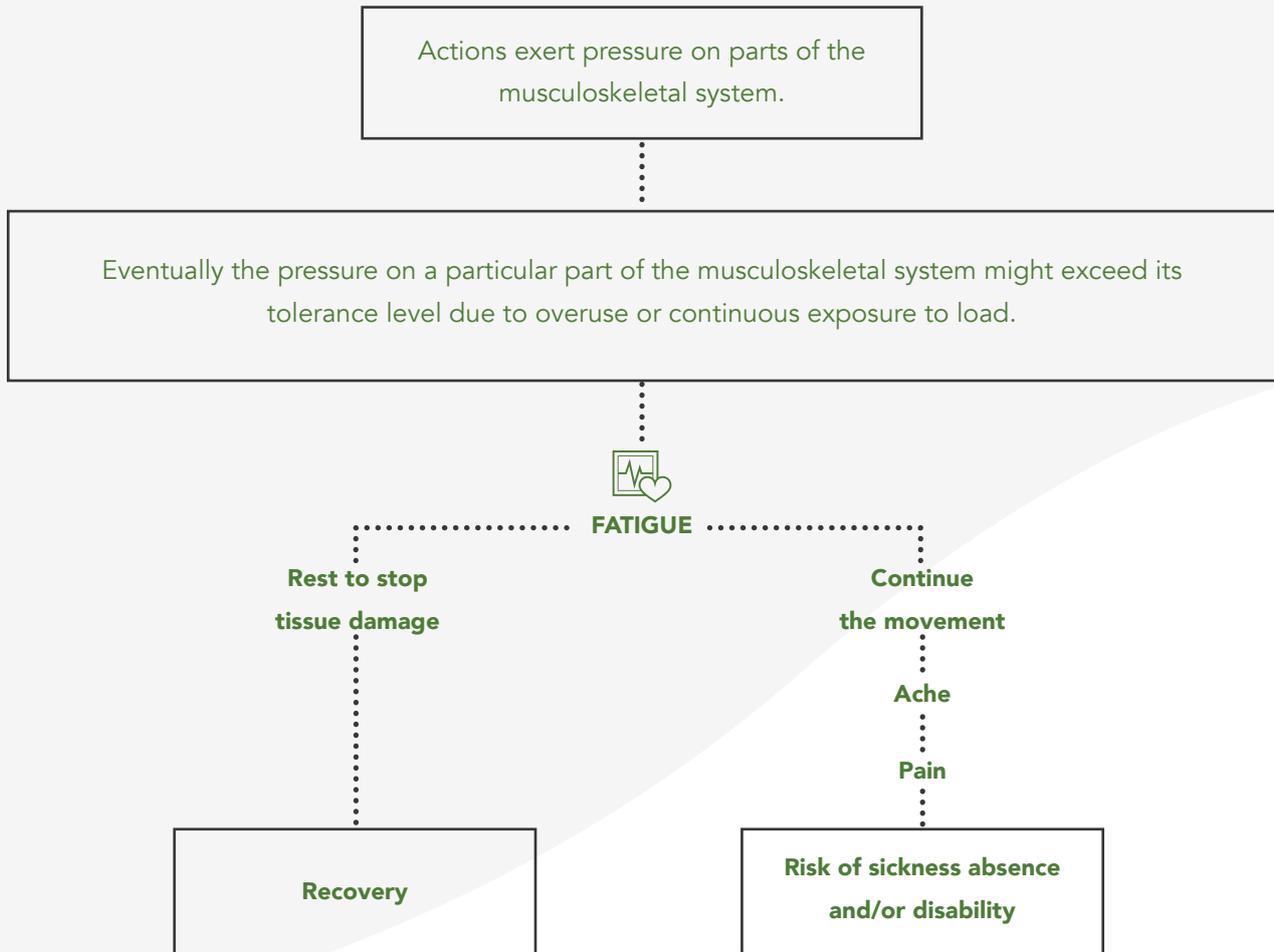
CUMULATIVE

They are **cumulative** and build up over time. If the signs are spotted early enough and changes are made, the onset of MSDs can be averted.



The onset of MSDs

MSDs are caused by prolonged pressure on parts of the musculoskeletal system. Resting the affected area for a sufficiently long time can reverse the onset of MSDs.



The stages of MSDs

1
ACUTE STAGE
Occasional pain and flare-ups.
The body's immune defences try to combat the pain.

2
SUB-ACUTE STAGE
The immune system weakens and the pain becomes more severe.

3
CHRONIC STAGE
The pain becomes more severe and the condition does not respond to treatment.

WORK-RELATED MUSCULOSKELETAL DISORDERS (WRMSDs)

Sometimes MSDs can be caused by overuse or awkward postures during work activities (work-related musculoskeletal disorders – WRMSDs).

Most commonly, WRMSDs affect the hands, wrists, elbows, neck and shoulders (most work activities involve the use of the arms and hands), although they don't solely affect the upper limbs. WRMSDs are commonly categorised as:

- **Work-related upper limb disorders** (WRULDs) – e.g. problems with the hands, wrists, shoulders and neck

such as repetitive strain, carpal tunnel syndrome and hand-wrist tendon syndromes.

- **Work-related lower limb disorders** (WRLLDs) – e.g. problems with the hips, thighs, knees, shins, ankles and feet.
- **Work-related low back pain.**

Work-related musculoskeletal disorders (WRMSDs) accounted for 41% of sickness absence in Great Britain in 2015/16 and an estimated 8.8 million lost working days (an average of 16 days lost for each case) ([Labour Force Survey, 2016](#)).

WRMSDs by part of musculoskeletal system

Muscle injury = **strain**

Bone injury = **fracture** (by accident and injury at work)

Joint injury = **dislocation** (when the joint is pulled out of alignment), **subluxation** (a partial separation of the joint) or **osteoarthritis** (caused by a breakdown in cartilage)

Cartilage injury = **tear**

Injury to **intervertebral discs** = **herniated/ruptured** discs, or **degenerative disc disease** (caused by ageing)

Ligament injury = **sprain**

Fascia injury = **fasciitis**

Tendon injury = **tendonitis**

Bursa injury = **bursitis**

LOCATION AND CAUSES OF WRMSDS

Figures from the [THOR-GP scheme](#) (a project using a network of GPs with training in occupational medicine to determine the incidence of occupational disease,

work-related ill health and sickness absence burden in the UK and the Republic of Ireland) highlighted the following trends in the reporting of WRMSDs to GPs from 2013-2015:

Location of WRMSD	Cause (task)	Cause (movement)
Lumbar spine	Heavy lifting	Material manipulation (e.g. moving, pushing, lifting)
Hand/wrist/arm	Material manipulation (e.g. moving, pushing, lifting, repetition)	Lifting, repetitive movement
Hand/wrist/arm	Keyboard	Forceful grip
Knee	Guiding/holding tool, kneeling	Posture



Sometimes MSDs can be caused by overuse or awkward postures during work activities (work-related musculoskeletal disorders – WRMSDs).

The Labour Force Survey (2016) (quoted in [HSE, 2016](#)) reported on the prevalence of WRMSDs by sector:

- **Agriculture:** WRMSDs are the most common occupational non-fatal injury and illness for farm workers.
- **Construction:** This sector has a high rate of WRMSDs due to the physical nature of the activities (e.g. plastering, brick laying and carpentry, and the use of power tools).
- **Transport and storage** (land and water transport, postal and courier services and warehousing): WRMSDs are more prevalent amongst those employed in the transport and storage sector than across UK industry as a whole – it has been suggested that postal workers, who represented 0.7% of the UK workforce in 2015, report 10% of WRMSDs ([HSE, 2016](#)).
- **Human health and social work:** Nursing is a sector of human health and social work that is strongly associated with WRMSDs, particularly due to lifting patients.

CAUSES OF WRMSDS

In many cases, WRMSDs are caused by repetitive or prolonged movements or actions at work.

Repetitive actions, particularly in work processes that require a person to perform the same movement repeatedly without time to recover in between. Work processes that don't allow a person control over the timing (e.g. working on a production line) can cause stress, which in turn can cause muscle tension and an increased risk of developing MSDs. This also applies to jobs that require intensive keyboard activity.

Use of force (i.e. the amount of effort required to perform a task). The more muscular effort is required, the longer is needed to recover between tasks. If the tasks requiring force are repetitive, with limited or no time to recover between tasks, then fatigue will set in making it harder to perform the task and ultimately increasing the chance of injuries occurring.

Awkward working postures or poor workstation layout. Holding the body in any one position for extended periods can cause pain or fatigue, and if parts of the body are near the extremes of their range of movement (e.g. bent over, twisted, reaching above the head) then stretching of the tendons and nerves can occur. Equally, holding the neck and shoulders in the same position (e.g. when using the arm for particular movements) can cause the neck and shoulders to become overtired and the arm to become fatigued and more prone to injury.

Heavy lifting. Attempting to lift heavy items can cause tears or damage to muscles, as well as tendonitis or spinal injuries.

Vibration. Vibration can be localised (e.g. from using vibrating hand tools) or whole-body vibration (e.g. from driving lorries or buses). People who are exposed to localised vibration may experience numbness, pain, or loss of touch and grip, which can make it harder to control the tools and require more force to operate them or awkward body positions to control them. This increases the risk of the onset of MSDs.

Prolonged sitting or standing. Sitting still for prolonged periods (particularly in a slouched position) can put the muscles in the back and spinal discs under pressure, and can cause increased stress of the back, neck, arms and legs. Prolonged standing can cause muscular fatigue, low back pain and stiffness in the neck and shoulders.

Working in cold environments. When our bodies are

cold they become less flexible, and everything requires more energy. Equally, when our hands become numb it is easy to misjudge the amount of force required to operate tools.

Working at speed or under stress. This can cause the muscles to become tense, which leads to fatigue and, potentially, the onset of WRMSDs.

LEGISLATION GOVERNING MSDS

Employers have a legal responsibility under the [Health and Safety at Work etc Act 1974](#) to support the health and wellbeing of staff, and various pieces of legislation apply directly to the prevention and management of MSDs in the workplace.



Legislation governing all organisations

Employers have a duty to carry out risk assessments to assess the risks to health and safety of employees whilst they are at work. These duties are enshrined in the [Management of Health and Safety at Work Regulations 1999](#).

The [Equality Act 2010](#) stipulates that employers have a duty to make reasonable adjustments for employees with a disability or a medically-reported health problem (including diagnosed MSDs).

The [Workplace \(Health, Safety and Welfare\) Regulations 1992](#) cover a wide range of basic health, safety and welfare issues and apply to most workplaces.

The [Provision and Use of Work Equipment Regulations 1998 \(PUWER\)](#) outline what employers need to do to protect staff who are using equipment of any kind in the workplace.



Legislation governing specific activities

Those who work regularly with visual display units and are at risk of experiencing neck, shoulder, arm or back pain, are protected under the [Health and Safety \(Display Screen Equipment\) Regulations 1992 as amended by the Health and Safety \(Miscellaneous Amendments\) Regulations 2002](#).

Employees who are exposed to vibration at work are protected under the [Control of Vibration at Work Regulations 2005](#).

Workers involved in manual handling tasks at work are protected under the [Manual Handling Operations Regulations 1992 \(as amended in 2002\)](#).

Workers who use any form of lifting equipment in the workplace are protected under the [Lifting Operations and Lifting Equipment Regulations 1998 \(LOLER\)](#).

REPORTABLE WRMSDS

Under [RIDDOR](#) (Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013), certain occupational diseases are classed as 'reportable' to the Health and Safety Executive (HSE) in order to identify and minimise risks. These are diseases that are linked with occupational exposure to specific hazards and have been diagnosed by a doctor. They include the following WRMSDs:

- **Carpal tunnel syndrome.**
- **Cramp of the hand or forearm** (when it is so severe that it is debilitating and leads to a clinical diagnosis).
- **Hand-arm vibration syndrome** (HAVs).
- **Tendonitis or tenosynovitis.**

Risk factors for WRMSDs

Whilst some MSDs are largely preventable by making changes to working practices on the back of a risk assessment, there are other non-work-related risk factors such as:

- **Age:** The population is ageing and for both men and women the likelihood of developing WRMSDs increases significantly by age due to natural deterioration of the muscles, bones and joints. Men and women in the 45-54 and 55+ age group are statistically at a much greater risk of developing WRMSDs than those who are younger ([HSE, 2016](#)).

- **Gender:** In all age brackets (with the exception of 55+) WRMSDs have been shown to be more prevalent in men, although the differences are not significant ([HSE, 2016](#)).
- **Individual:** Many factors can affect a person's chances of developing WRMSDs such as obesity, spinal abnormalities, stress, low levels of fitness, family history and genetic predisposition.

Reducing the negative impact of WRMSDs in the workplace

WRMSDs cause a significant burden to the UK economy through absenteeism ([41%](#) of sickness absence in Great Britain in 2015/16 was due to MSDs) and presenteeism (people coming to work despite being too unwell to work productively). In the workplace, both absenteeism and presenteeism caused by WRMSDs have a significant impact on:

- **productivity;**
- **engagement** (particularly amongst those who are suffering from WRMSDs and are struggling to work effectively);
- **morale** (absenteeism and reduced productivity can negatively affect those who are covering workloads);
- **staff turnover.**

Because of the significant impact of MSDs in the workplace, the [Centre for Musculoskeletal Health and Work](#) was launched in February 2015 to identify ways to minimise the impact of MSDs at work with a view to:

- preventing WRMSDs;
- improving advice on fitness to work and return to work for people who have undergone musculoskeletal surgery;
- identifying interventions to support the extended working lives of older workers, particularly those with MSDs;
- training a new generation of researchers with a broad range of skills.

The centre carries out research based on four main themes:

- back, neck and upper limb disorders;
- osteoarthritis and employment;
- inflammatory arthritis and employment;
- MSDs and work for older employees.

Effectively minimising and preventing the onset of WRMSDs, and dealing with existing cases, can be done in many ways:

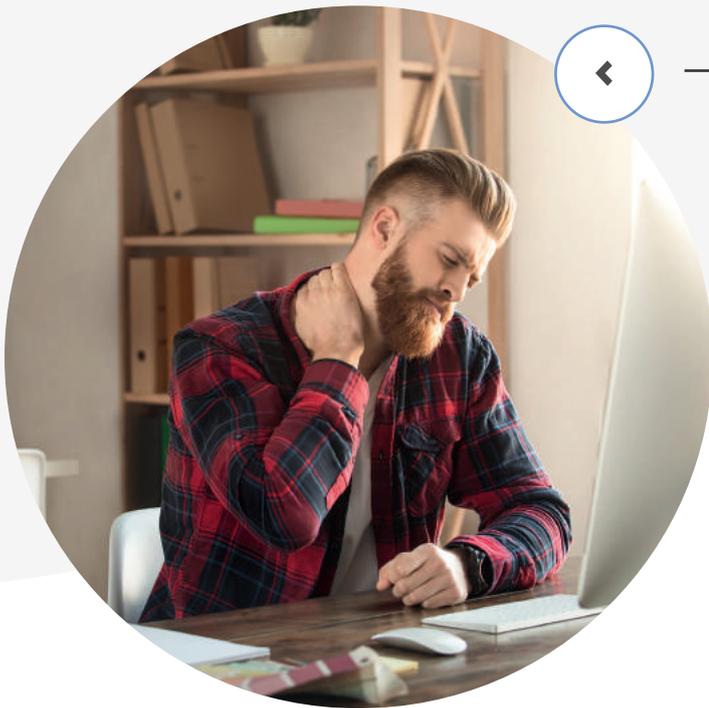
- **Evaluating and assessing the risks** of the onset of WRMSDs (e.g. through a risk assessment).
- Taking steps to **control the risks** identified in risk assessments.
- Encouraging staff to **report WRMDs early**. Dealing with issues early (during the acute phase) makes a recovery much more likely.
- **Focusing on job design** (e.g. allowing autonomy to choose when to do particular tasks, allowing time for breaks, including a variety of tasks using different muscle groups).

NEGATIVE IMPACT OF WRMSDS – POTENTIAL CONSEQUENCES FOR SUFFERERS

- **Pain and poor wellbeing.**
- **Sickness absence** leading to a loss of earnings and reduced quality of life, social status, identity and morale.
- Increase in **presenteeism** (coming to work when not really well enough to work effectively). This has consequences for organisations (reduced productivity), but can also cause issues for individuals in terms of a worsening of the

condition, reduced morale, and the potential for extended periods of sickness absence in the future.

- Potential **difficulty returning to the labour market** after an extended period of absence.
- Potential for **permanent departure from the workforce.**
- Risk of **disability.**
- **Early retirement**, which can cause financial problems for those who do not have sufficient financial resources in place for retirement.



Presenteeism - Coming to work when not really well enough to work effectively. This has consequences for organisations (reduced productivity), but can also cause issues for individuals in terms of a worsening of the condition, reduced morale, and the potential for extended periods of sickness absence in the future.

JOB DESIGN

Job design is the process of stipulating the main elements of a job (duties, responsibilities, processes and procedures) and matching these to the capabilities of the person doing the job. Often **engineering controls** are used to design jobs to take into account the capabilities and limitations of the workforce. This could include making changes to workstation layout or changing the way that materials are transported, such as reducing the amount of lifting or carrying required through automation.

Some **administrative controls** may also be useful as temporary measures, such as job rotation to allow breaks for rest or recovery, reducing shift time, allowing for more breaks, or training workers in spotting the signs of MSDs and taking steps to reduce the stressors that cause them.

THE ROLE OF OCCUPATIONAL HEALTH IN THE MANAGEMENT OF WRMSDS

Because of their understanding of both the workplace and the clinical needs of workers, occupational health practitioners are uniquely placed to support line managers in managing staff with WRMSDs. They can help to balance the needs of employers and employees, and make informed decisions about a person's ability to continue working, the potential need for adaptations, or about a return to work for those who have been off work due to their condition.

Occupational health may call on the support of allied professionals in the management of WRMSDs who may already form part of the occupational health team:

Physiotherapists. According to the [Chartered Society of Physiotherapy](#), patients with MSDs are the largest patient population treated by physiotherapists (around 1.9 million new patients each year). Physiotherapists work with occupational health, employers and employees to investigate working practices and offer training in elements of the role that might be causing issues (e.g. workstation layout, lifting and handling techniques, etc.).

Ergonomists. An ergonomist is trained to study all aspects of work situations and to fit them to the attributes of workers. Each situation is unique and the impact a job has on a person will depend on the nature of the work (e.g. working position, job tasks, levels of pressure, etc.) and the characteristics of the worker (e.g. age, height, weight, state of health, etc.).

An ergonomist would carry out a variety of tasks relating to MSDs, including:

- observing people in their work environments and **detecting problems** (e.g. sedentary behaviour in office environments, or repetitive actions on production lines);
- **identifying improvements or necessary adaptations;**
- **offering guidance to workers and employers.**

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