MANUAL HANDLING RISK ASSESSMENT

A course book for the NEBOSH HSE Certificate in Manual Handling Risk Assessment

The NEBOSH HSE Certificate in Manual Handling Risk Assessment is a qualification for those who want to recognise, assess and reduce manual handling risks in the workplace. This course book and accompanying syllabus have been developed by NEBOSH, in conjunction with Great Britain's health and safety regulator, the Health and Safety Executive (HSE), and is based on published HSE guidance.

The qualification is suited to employers and employee representatives who want to start assessing manual handling risk in their organisation and implement effective control measures. It will also help those already involved in managing manual handling risk to deepen their understanding of the subject and train in the use of specific HSE manual handling assessment tools.

Edition 1

Version 1

Contents

A guide to the symbols used in this course book

ELEMENT 1

THOUGHT PROVOKER

These ask you to think about what you have been learning, to relate it to your own experience.

ACTIVITY

Carry out an activity to reinforce what you have just read.

ELEMENT 2

EXAMPLE

Real or imagined scenarios that give context to points made in the text.

KEY TERMS

Definitions of key process safety terminology.

ELEMENT 3

The Spine

Muskuloskeletal disorders can affect the limbs and the back. It is important to know more about the spine, one of the strongest parts of the body. It is made up of solid bones, connected by strong discs and ligaments and surrounded by muscles.

The purpose of the spine

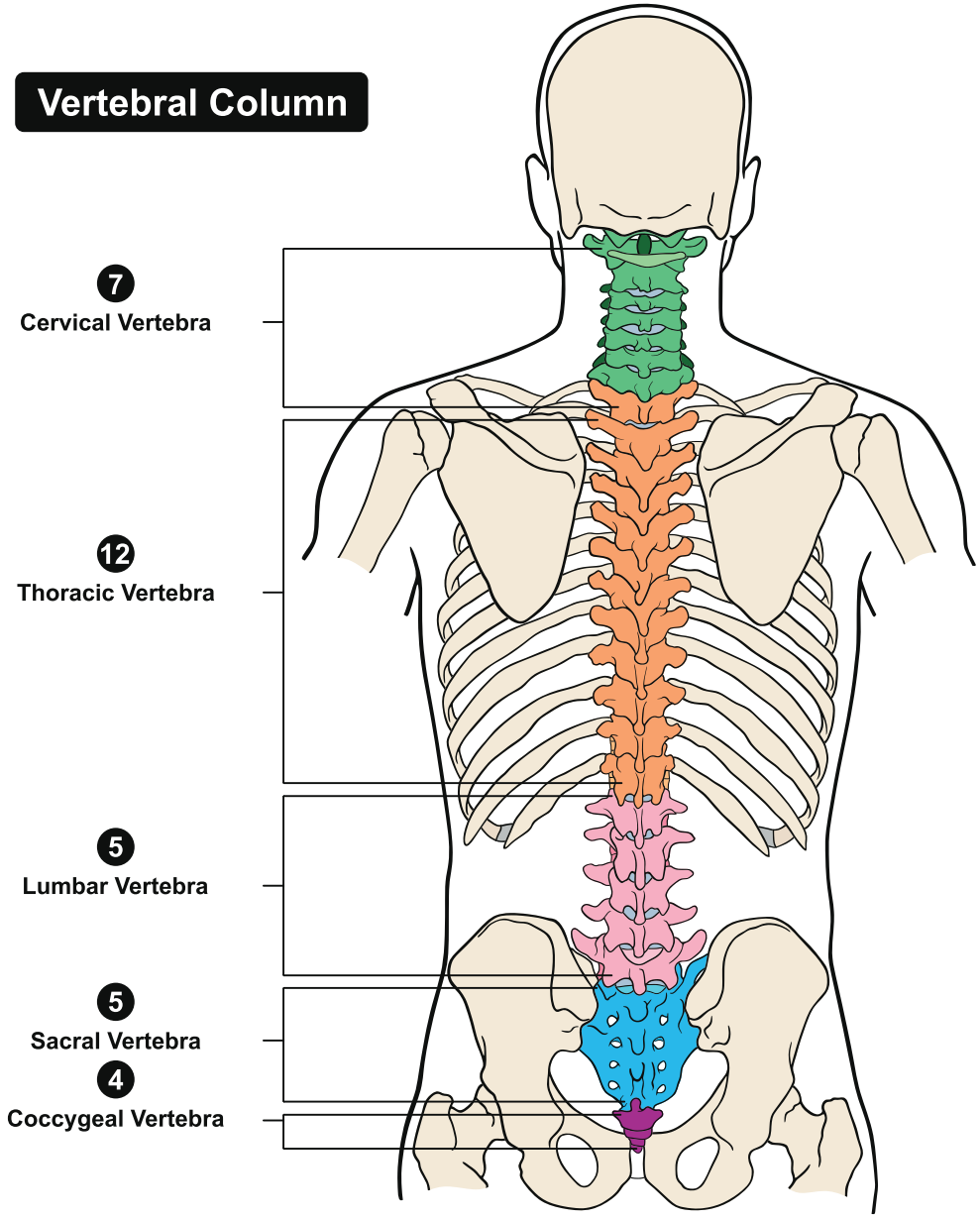
The spine supports the entire body and is responsible for high levels of mobility. The spine is involved when we reach for, grasp, lift or carry objects; walking and even standing involves not only the legs but the whole back too.

The spine provides structural support for the head, shoulders and chest. It serves as a connecting device between the upper and lower body with ligaments, tendons and muscles all working together.

Finally, the spine also plays an important role in protecting the spinal cord and nerve routes that transfer messages up and down the body.

The anatomy of the spine

The spine is made up of 33 ring-like bones called vertebrae which are linked by a series of mobile joints. The diagram shows the types of vertebra:



The different types of vertebra in each part of the spine

The Spine

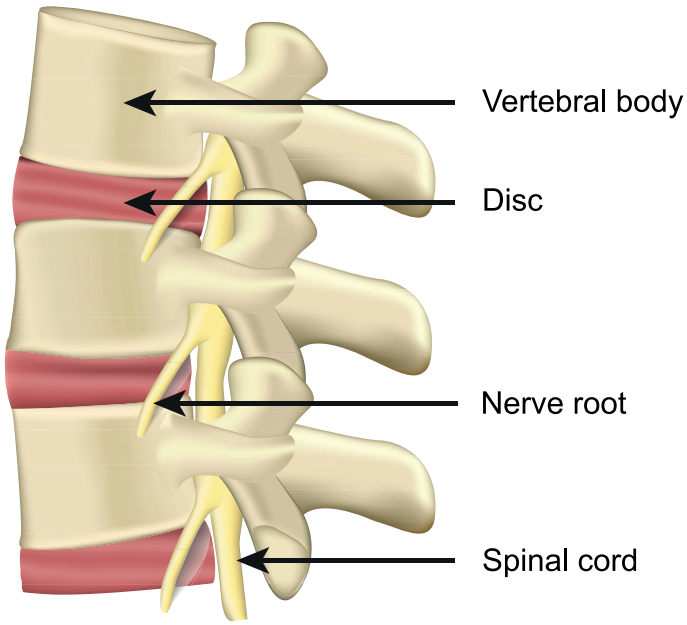


Diagram showing vertebrae, discs, and nerves

Between the vertebrae are **invertebral discs** with a tough outer layer of cartilage.

The discs form a mobile joint between the vertebrae to allow for movement, provide cushioning, and shock absorbancy.

Ligaments are a type of strong, binding connective tissue. Strong ligaments and muscles around the spine stabilise the vertebrae and assist in controlling movement.

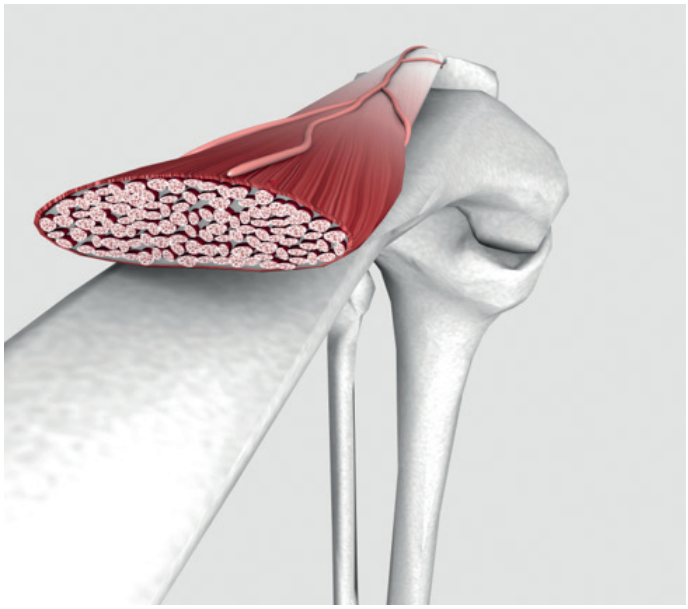
Tendons are fibrous cords of connective tissue that link skeletal muscles to bones and help the muscles to move bones and joints.

Muscles are made of filaments that can stretch and contract, returning to their original shape. The majority of the skeletal muscles stretch across joints to link one bone with another and work in groups. Skeletal muscles provide the forces that enable the body to move and maintain its posture.

In a relaxed muscle, the thick and thin myofilaments (the fine threads within a muscle fibre) overlap a little. When muscles contract, the thick filaments slide further in between the thin filaments like interlacing fingers. This action shortens the entire muscle fibre.

The more shortened muscle fibres there are, the greater the contraction in the muscle as a whole.

Muscles provide mechanical power and often work as a pair; when one contracts to produce movement it is called 'agonist'. The opposite, relaxing muscle is known as the 'antagonist'.



Muscle attached to bone

The Spine

Individual spinal **joints** do not have a wide range of movement, however when they work together they allow a great deal of mobility, ie the spine can arch backward, curve forward and twist around. The body is able to bend further forward than backward due to the shape of the vertebrae.

Flexion (forward bending)

Side bending (left and right)

Extension (backwards bending)

Rotation (towards the left and right)

The cervical spine is the most flexible part, which provides higher levels of motion in the head.
This enables directionality of our major senses such as sight, hearing and smell.

The Spine

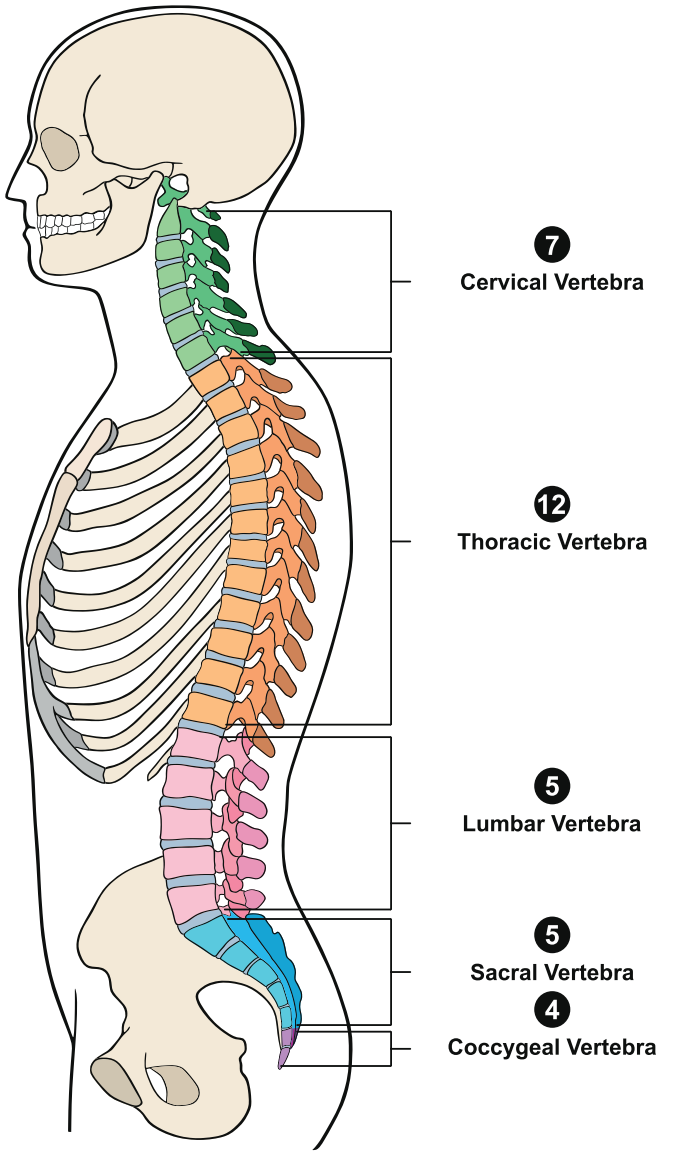
Shape of the spine

A healthy spine is 'S' shaped and has three curves which help to make it resilient and maintain balance. The cervical and lumbar regions curve forwards whereas the thoracic and sacral regions curve backwards. These curves help the spine to absorb shock, support the head and keep the body stable. Abnormal curves may be due to bone disease, poor posture or congenital defect.

The two curves in the neck (cervical region) and lower back (lumbar region) that extend toward the front of the body are known as lordosis. The other curve which extends backwards, in the upper back, is known as kyphosis.

Limitations of the spine

The spine needs to be rigid enough to support the body when standing upright, but also flexible enough to allow for movement of your upper and lower limbs. The body's requirements for strength and flexibility sometimes results in injury as these two factors seemingly oppose each other during some manual handling activities.



The curves of the spine

Common tasks and common injuries

People can sustain injuries as a result of a variety of workplace tasks including; single event excessive force, repetitive wear and tear, and static loading.

Excessive force

Tendons, which attach muscle to bone, can be damaged by a sudden powerful movement. Muscle strains and tears can occur due to over exertion or sudden pulling or twisting movements. A tear can be large (due to over exertion) or microscopic (due to repetitive movement).

Typical workplace tasks where excessive force can result in injury include:

- lifting heavy equipment
- jerking action while pulling or pushing awkward loads
- lifting people (ie medical patients)
- lifting while twisting
- trying to catch relatively heavy falling objects.

ACTIVITY

Note down any tasks in your workplace that might involve high forces.

Repetitive wear and tear

Repetitive wear and tear can result in injury when a person's tolerance to repetitive work diminishes over time (as fatigue increases). This can cause temporary discomfort and reduced performance, which requires a decent period of rest to recover from repetitive manual handling.

Repetitive wear and tear also includes cumulative disorders, where repeated over-exertion causes microscopic tears in the joints. These are injuries which could repair naturally if given time (ie suitable rest), but if they continue to accumulate, will result in significant soft tissue damage. These injuries usually develop over time and can cause pain, tingling, numbness and weakness.

Typical workplace tasks where repetitive wear and tear can result in injury include:

- digging
- repetitive lifting and carrying
- working at a conveyor belt
- packing products and filling or unloading from pallets.

ACTIVITY

Note down any repetitive tasks in your workplace.

Common tasks and common injuries

Static loading

Static loading on muscles happens when the same posture or position is held throughout a period of physical exertion. The prolonged contraction of the muscle also constricts the blood vessels which are embedded within the muscle – this reduces the provision of oxygen, energy, and nutrients.

Typical workplace tasks where static loading can result in injury include: standing or sitting in a fixed posture for a long time, working for an extended period with the body bent forward or arms extended, gripping tools which cannot be put down at regular intervals, and even carrying objects for long distances.

ACTIVITY

Note down any tasks in your workplace that might involve static postures.

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