

## **SPINAL CORD INJURY**

### **What is the Spinal Cord?**

The spinal cord is an extension of the brain, a thick bundle of nerve fibres from which individual nerves branch off to connect your brain with the muscles/ skin and internal organs.

Nerves are much like telephone wires, carrying messages in both directions -from the brain to individual muscles, telling them to move, and from the skin and other organs to the brain, communicating sense of touch, pain, pressure or heat and cold. If you imagine the brain as being like a vast telephone exchange, dealing with all these messages, then the spinal cord is the last section of thick cable entering the exchange.

### **What happens when the spinal cord is damaged?**

Most spinal cord damage is caused by a physical injury.

Injury to the human spinal cord causes paralysis - the inability to deliberately move or feel particular parts of the body.

In general, the higher the level of the injury, the more limbs will be paralysed and die more disruption to normal bodily functions.

### **Definition of terms:**

**Paraplegia** - the term used for an injury which is below the level of the neck causing paralysis to some degree in the legs and abdomen. Movement in the trunk and chest will depend on how high the lesion is.

**Tetraplegia** - refers to an injury to the spine in the cervical region, causing partial or full paralysis to the arms.

Hence all four limbs are affected, also the chest muscles which may give rise to difficulty with breathing, coughing and clearing the chest.

**Autonomic Paralysis** - This is paralysis of the autonomic nervous system, which controls the involuntary functions of internal organs and glands. (It is outside of, but close to, and connected with the spinal cord).

Its messages control the bowel and bladder, sexual function, blood circulation and pressure and sweating.

### **Complete and incomplete**

This refers to the extent of paralysis, and the degree to which specific bodily functions are affected. If the spinal cord is only partly damaged, some messages may continue to pass between the brain and the muscles and organs.

Spinal cord injured people are often described by the level and completeness of their lesion.

Someone who broke their neck in a diving accident might be a tetraplegic and a 'C4 complete', meaning that their spinal cord was damaged at the level of the 4<sup>th</sup> cervical nerve, and that the damage was complete.

Someone who broke their back while horse riding might be a 'T12 incomplete', meaning that their cord was injured at the level of the 12<sup>th</sup> thoracic nerve, but that they retain some function in lower nerves.

## **Brief History**

- 90% of people who had spinal cord injuries (SCI) in the first world war died within one year.
- By 1937, 80% of these people died within three years.
- During the second world war several specialist spinal units were established to cope with these spinal injuries.
- In 1951, the Spinal Injuries Centre at Stoke Mandeville Hospital had expanded from one small ward to a vast 200 – bed complex.
- Even so, by the 1960's there was still a 35% mortality rate among tetraplegics.
- But improvements in the treatment of SCI have come about by the management of the injured person, and not by advances in surgical technique or new drugs.

SOME OF THE GREATEST IMPROVEMENTS HAVE BEEN IN TRAINING THOSE WITH SCI (and their carers) TO:

- AVOID PRESSURE SORES AND
- MINIMISE BLADDER AND KIDNEY INFECTIONS

Which in the past were a major cause of early death after discharge from hospital.

## **Who are these people with spinal cord injury**

Accidents can happen at any time to either YOU or ME.

The majority are in the younger age-group, mainly because over half of SCI's are caused by road traffic and sporting accidents. These SCI people could be very young children, mothers and fathers of young families, people young and old, but most with active lives still before them. There are thought to be 30,000 and 40,000 people in Britain today who have spinal cord injuries.

Each year there are about 750 to 1,000 NEW injuries (although there is no central register kept)

### **Key facts**

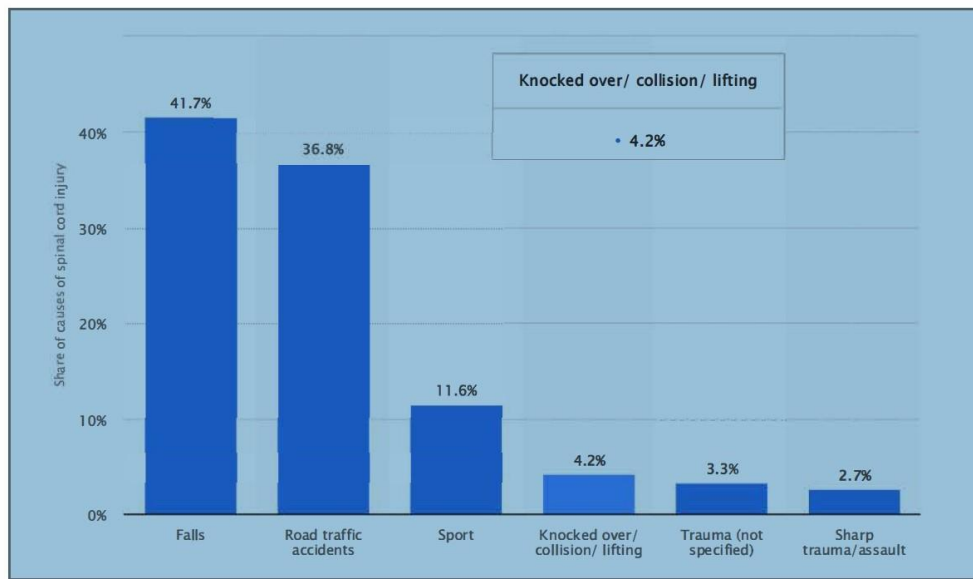
**Every year, around the world, between 250 000 and 500 000 people suffer a spinal cord injury (SCI).**

**Most spinal cord injuries are due to preventable causes such as road traffic crashes, falls or violence.**

**People with a spinal cord injury are two to five times more likely to die prematurely than people without a spinal cord injury, with worse survival rates in low- and middle-income countries.**

**Spinal cord injury is associated with lower rates of school enrolment and economic participation, and it carries substantial individual and societal costs.**

Share of common causes of spinal cord injury in the United Kingdom (UK) in 2015



### **Regeneration and Repair**

SCI is not an illness, so it can never be cured by drugs. The damaged tissue in the spinal cord does not regenerate or repair, unlike broken bones or damaged skin. Even when the bone or foreign bodies, which caused the damage, are removed, and the neck and back is perfectly aligned, the spinal cord will not repair itself.

No amount of bed-rest or exercise will cause the cells to bridge or circumvent the damaged area which prevents signals from the brain reaching the paralysed limbs, and sensory signals from the limbs replying to the brain.