Southport and Ormskirk Hospital NHS
NHS Trust

irwinmitchell solicitors

North West Regional Spinal Injuries Unit Education Day, Southport

17th March 2015

Spinal Cord Injury

Management

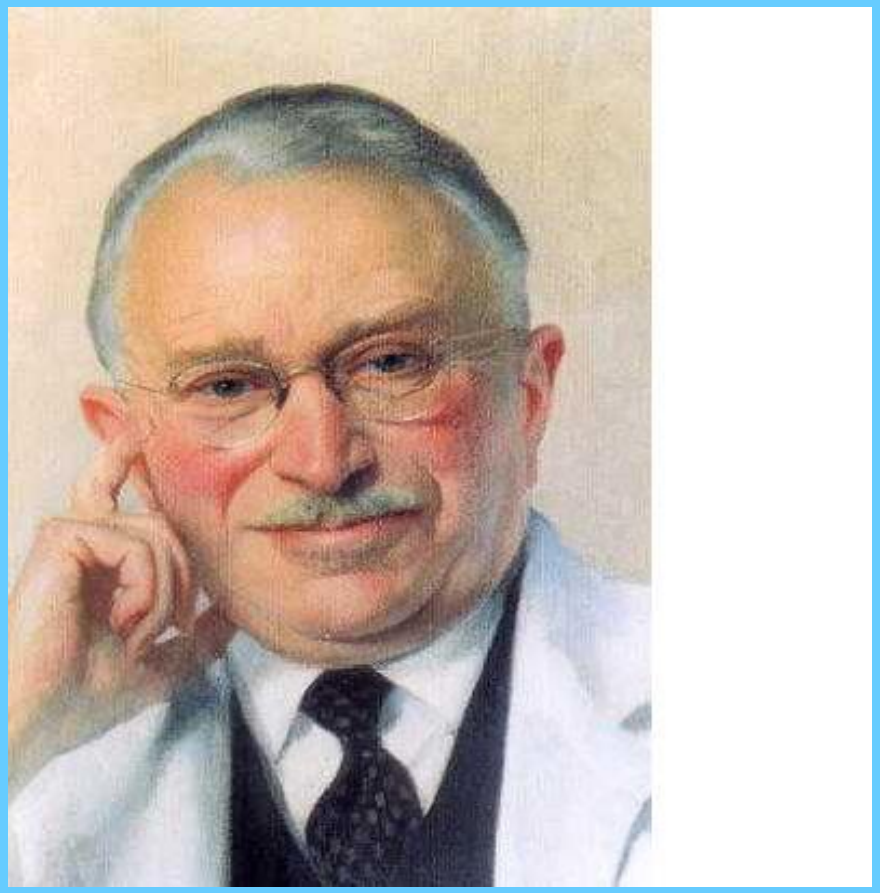
F. Selmi
Northwest Regional Spinal Injuries Centre
Southport

** ailment not to be treated **

Egyptian Physician 2500 BC

	1 year post injury survival
1st World War	10 %
2nd World War	90%

Sir Ludwig Guttmann
Stoke Mandeville Hospital



1.Systemic Disorder

2. Specialist Centres

3.Long term condition

11 Spinal Injuries Centres:

Stoke Mandeville
Stanmore
Salisbury
Oswestry
Sheffield
Wakefield
Southport
Middlesbrough
Glasgow
Belfast
Cardiff

Incidence:

World wide 10 - 20 / million

Age: 20- 40 & 70 years

Sex: 4 : 3 male/ female

Causes:

Traumatic 75%

RTA	45%
Accidental falls	34%
Sporting injuries	15%
Assaults	6%
Other	5%

Non Traumatic 25%

Congenital - Spina Bifida

Neoplastic - Metastases

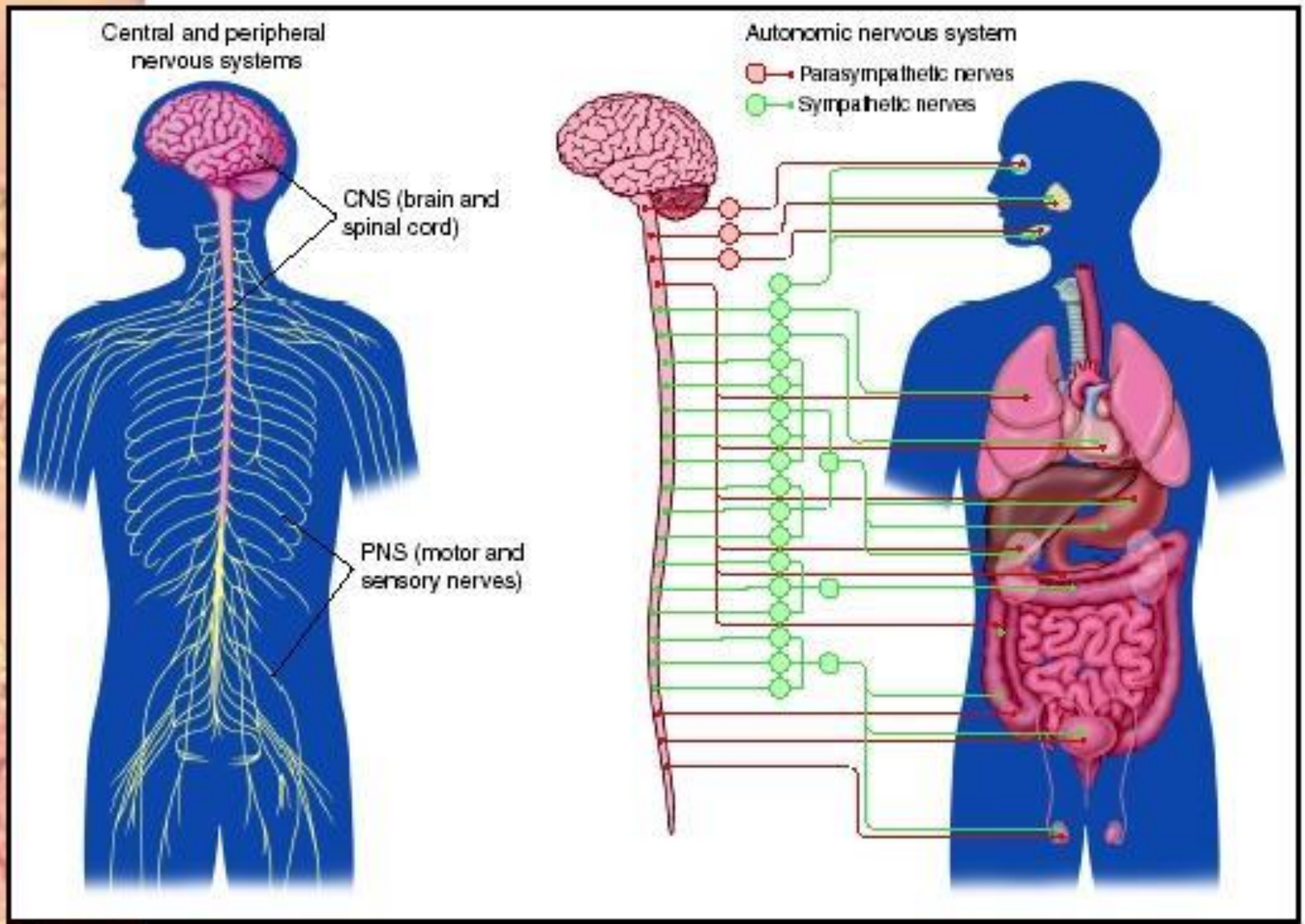
Infectious - Tr Myelitis, TB, Abscess

Vascular - AVM

Iatrogenic - Aortic Aneurysm

Degenerative- Disc

Nervous System:



Salient Features:

Vertebral Column

24 Vertebrae
05 Sacrum
01 Coccyx

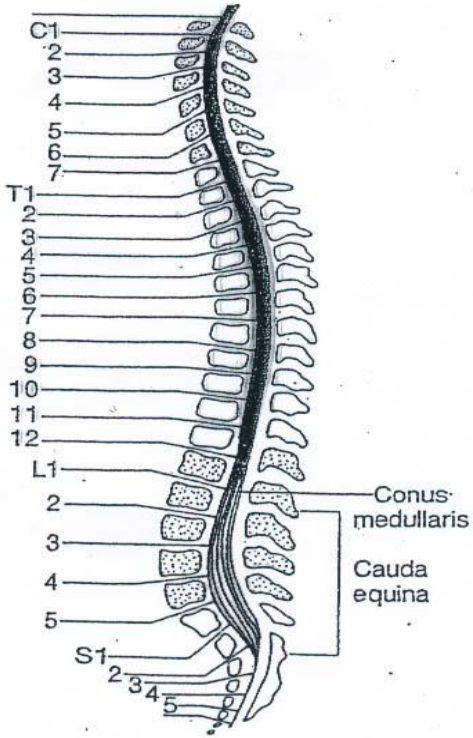
Spinal cord

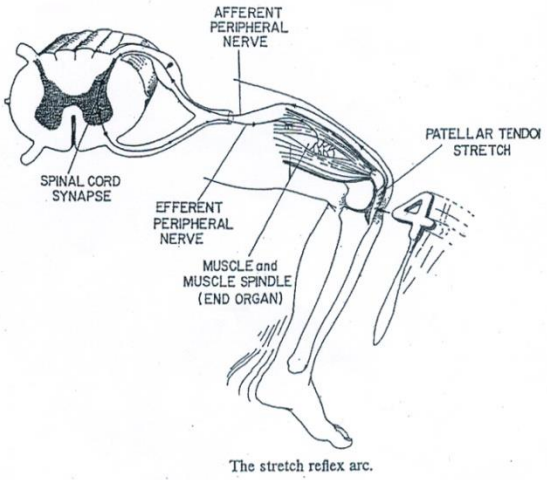
30 segments
Ends L1
Cauda Equina

Sympathetic Nervous System

Thoracic spine

Spinal Reflex arc

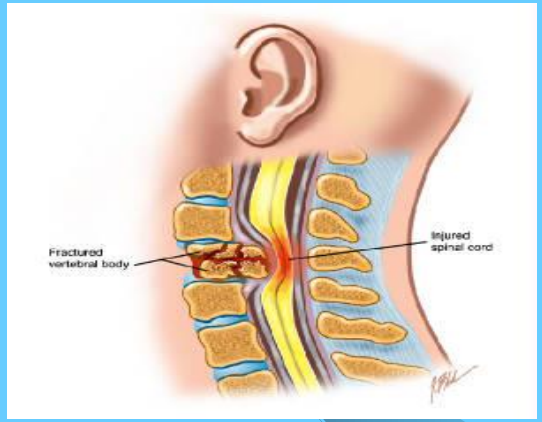




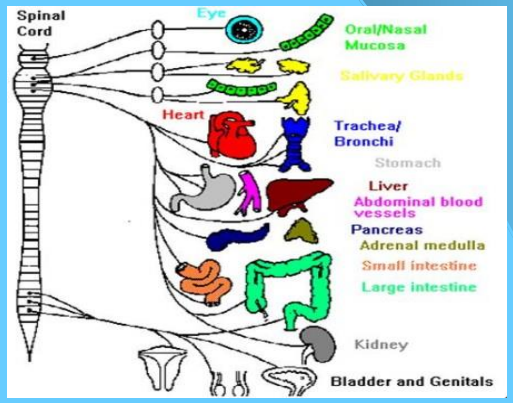
Consequences of Spinal Trauma:

1. Spinal (vertebral) Column

2. Spinal Cord Damage



3. Systemic Failure



4. Socio-economic problems

1.Spinal (Vertebral) Column Injury:

Type of fractures

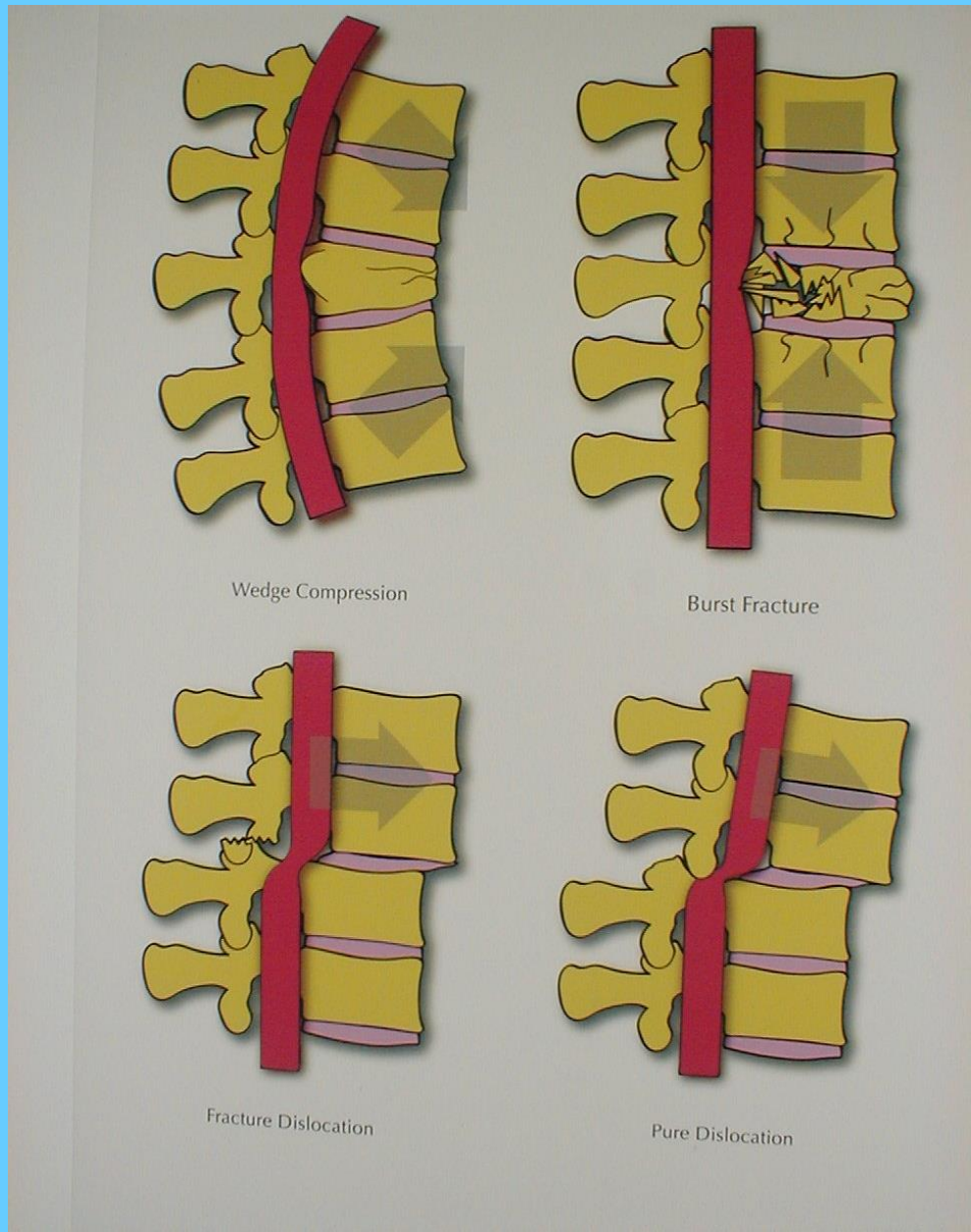
- Wedge
- Burst
- Fracture dislocation

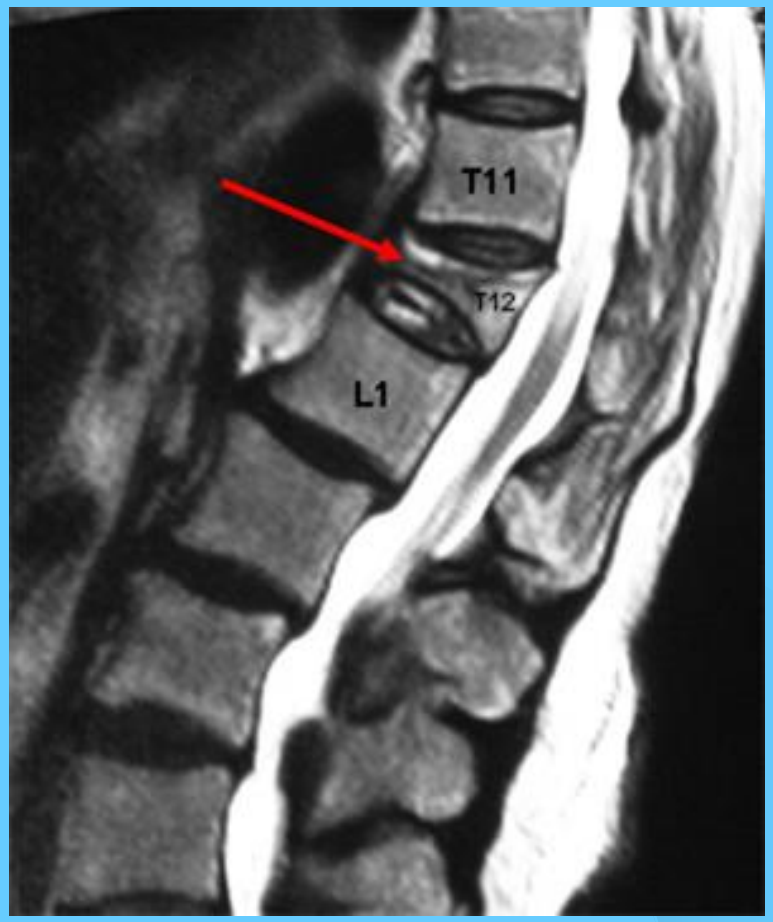
Level of Injury

Cervical	45%
Thoracic	40%
lumbar	15%

Multiple levels 10%

Spinal Cord injury without fracture




T11
T12
L1

Scene of Accident

Extrication Immobilisation and Evacuation

1.Cervical collar

Hard collar

2.Cervical extrication device

3.Full spine immobilisation

Spinal board

Scoop stretcher

Vacuum stretcher

4.Head immobilisation

Hospital

Immobilization / Stabilization

Conservative

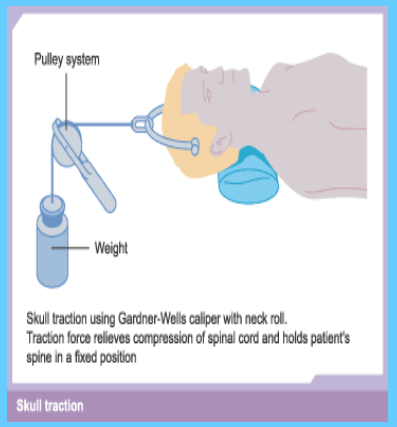
Bed Rest

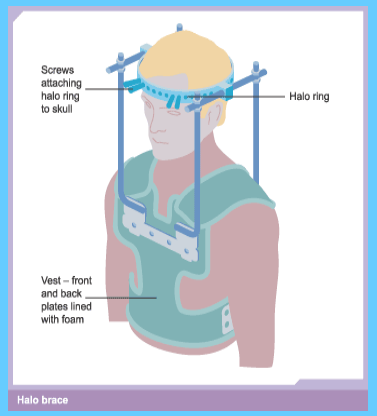
Spinal nursing care = Log rolling, bladder / bowel and skin care

Mobilise with a Brace

Surgical fusion /decompression

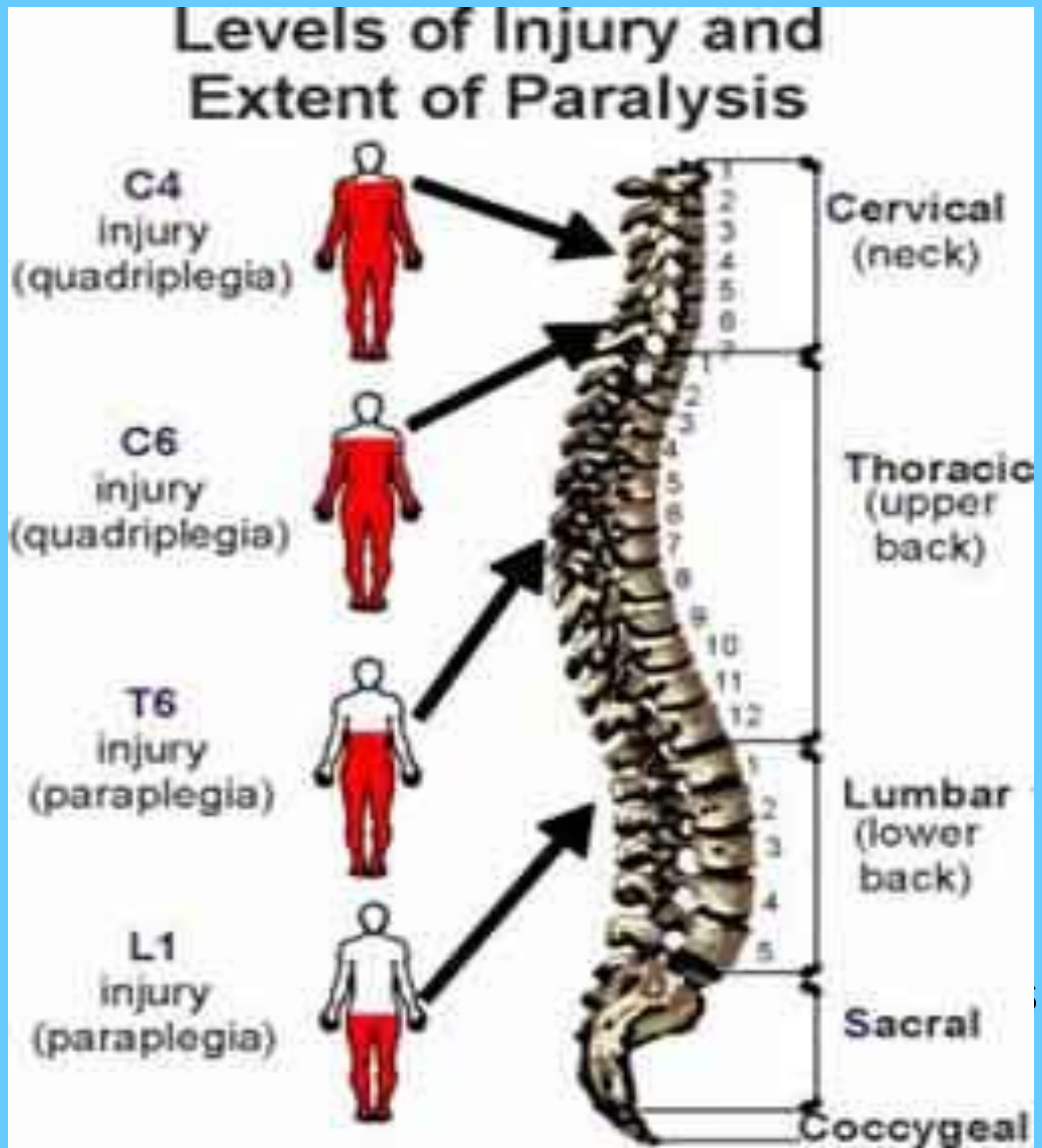
Monitor blood pressure on mobilisation





Evaluation of Spinal cord Injury

Level of Injury



Severity or Grade of Injury

Complete

- ASIA A
  - Loss of all power/Sens.

Incomplete

- ASIA B,C,D,E
  - Preservation of some power and sensation
    - Brown sequard
    - Central cord
    - Anterior cord
    - Cauda Equina

Management of spinal cord Damage :

Primary Damage — Time of Impact

Secondary Damage — Immediately following injury

Due to;

1 Increased oedema /swelling

2. Further disruption of the cord

Causes:

- Hypo tension
- Hypo-oxygenation
- Excessive movement of fracture
- Compression of the cord
- Bone frg, disc or haematoma
- Infections
- Electrolytic balance

3.Systemic Problems

Respiratory
Urinary
Bowel
Skin
Musculoskeletal
Cardiovascular
Sexual and fertility
Temperature regulation
Pain
Endocrine changes
Electrolytic changes

Respiratory system :

Effect

Inability to breathe or maintain ventilation

Inadequate respiration or gas exchange

Impaired cough, retained secretions and infections

Impairment depends on;

Level of Lesion

C1-2	Mechanical Ventilation
C3-4	Partial Ventilatory support
C5-8	Self Ventilation
T1-12	Cough impaired

Associated injuries

Pre-morbid chest diseases

Smoking

Therapeutic measures

1.Artificial airway (tracheostomy)

2.Mechanical ventilation

3. Chest Physiotherapy

Assisted coughing, breathing exercises

Urinary System

Effect

Acontractile Bladder > urinary retention

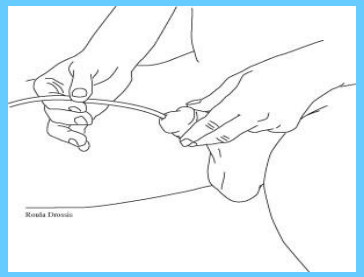
Indwelling / Intermittent catheter
Adequate fluid intake
Detrusor relaxant

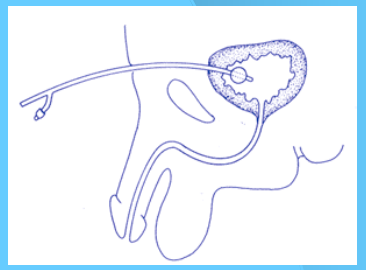
UMN (reflex bladder)

Sheath drainage

LMN (Areflexic Bladder)

Intermittent catheters





Complications

1. **Urinary tract Infections**
2. **Urinary calculi**
3. **Renal impairment**

Cardiovascular system

Neurogenic hypotension
Unopposed vagal effect

Effect

1.Hypo tension
Systolic 90-110

2.Bradycardia
Pulse 50-70/ min

Do not need a cardiac pacer maker!!!

Therapeutic measures

1.Hypotension **Systolic < 80 mmHg**

Urine output < 30 ml / h
IV fluids

Urine output > 30 ml / h
Ted stockings, Abdominal binder
Inotropic agents

2.Bradycardia **Heart rate < 50 / min**

Atropine and Prevent hypoxia
Avoid frequent vagal stimulation
e.g oral suction

Cardiovascular system Contd

Venous thrombosis

40% **Deep vein thrombosis**

5% **Pulmonary embolism**

Prophylaxis

Passive limb exercises

TED stockings

Warfarin / Heparins

Autonomic Dysreflexia

(Exaggerated Sympathetic reflex) common in lesions above T6

Causes

Blocked urinary catheter, Constipation
Pressure sore, Anal fissure, Ingrowing toe-nail

Warning Mechanism!!

Effect

Profound vasoconstriction below level of injury
Reactive vasodilatation above

Symptoms

Headache, High Blood pressure
Sweating/ flushing
Cerebral stroke/death

Treatment

Head up position
Nifedipine / GTN
IDENTIFY AND TREAT THE CAUSE

Gastrointestinal system

Effect

Autonomic Dysfunction / Paralytic ileus

Onset **0 - 48 hours after injury**

Early / **Spinal shock**

Nil by mouth

Nasogastric tube

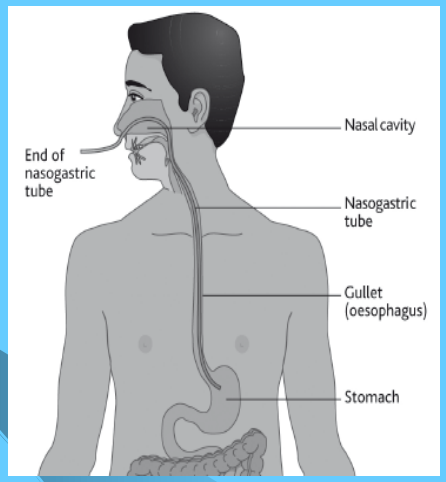
I V fluids

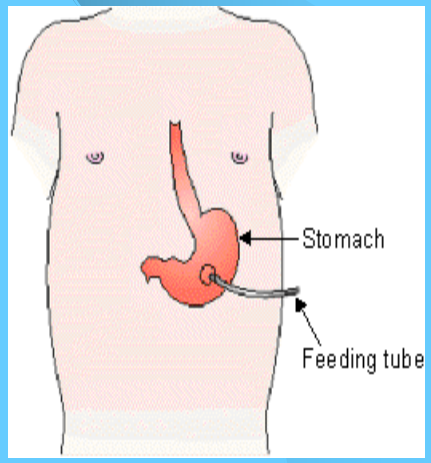
Parentral nutrition

UMN(reflex bowel) Bowel stimulants

LMN (areflexic Bowel) Manual evacuation / enema

Late **Constipation**





Complications

Stress Ulceration

Gastric protection

Omperazole, Ranitidine

Skin

1.Pressure sores:

Poor skin perfusion
Lack of sensation
Unrelieved Pressure

Sacrum, Ischium, Trochanter
Occiput, heels, scapulae. Groin

<u>Prevention</u>

Avoid prolonged pressure
Frequent turning every 2 hrs

<u>Treatment</u>

Prolonged bed rest
Expensive dressings

C<u>omplications</u>

Infection
Death

2.Cellulitis

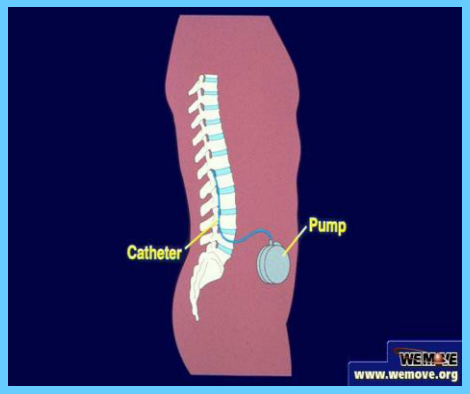
Musculo-skeletal.

Increased Tone and Spasms.

Upper motor neuron lesion
Below the level of injury
Alternate warning mechanism for the body

Management:

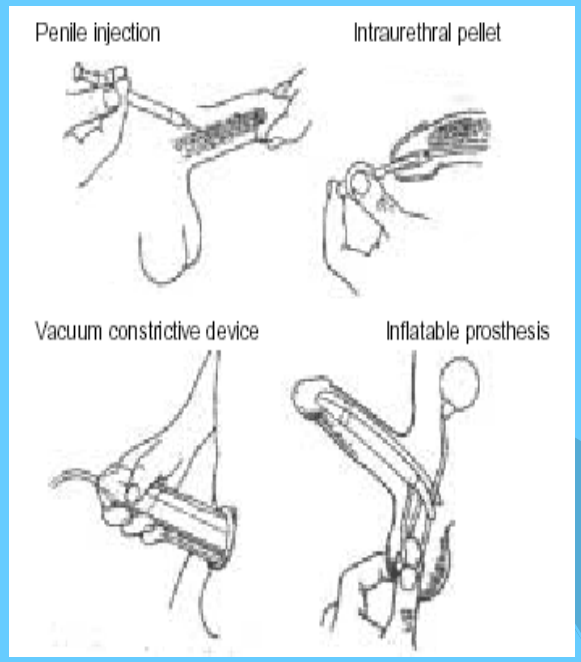
Physiotherapy / Hydrotherapy
Oral medication e.g Baclofen, Dantrium
Intrathecal Baclofen



Sexual & Fertility:

1. Erectile Dysfunction

   Reflex
   Psychogenic



2. Loss of orgasm

3. Reduced Fertility in Men

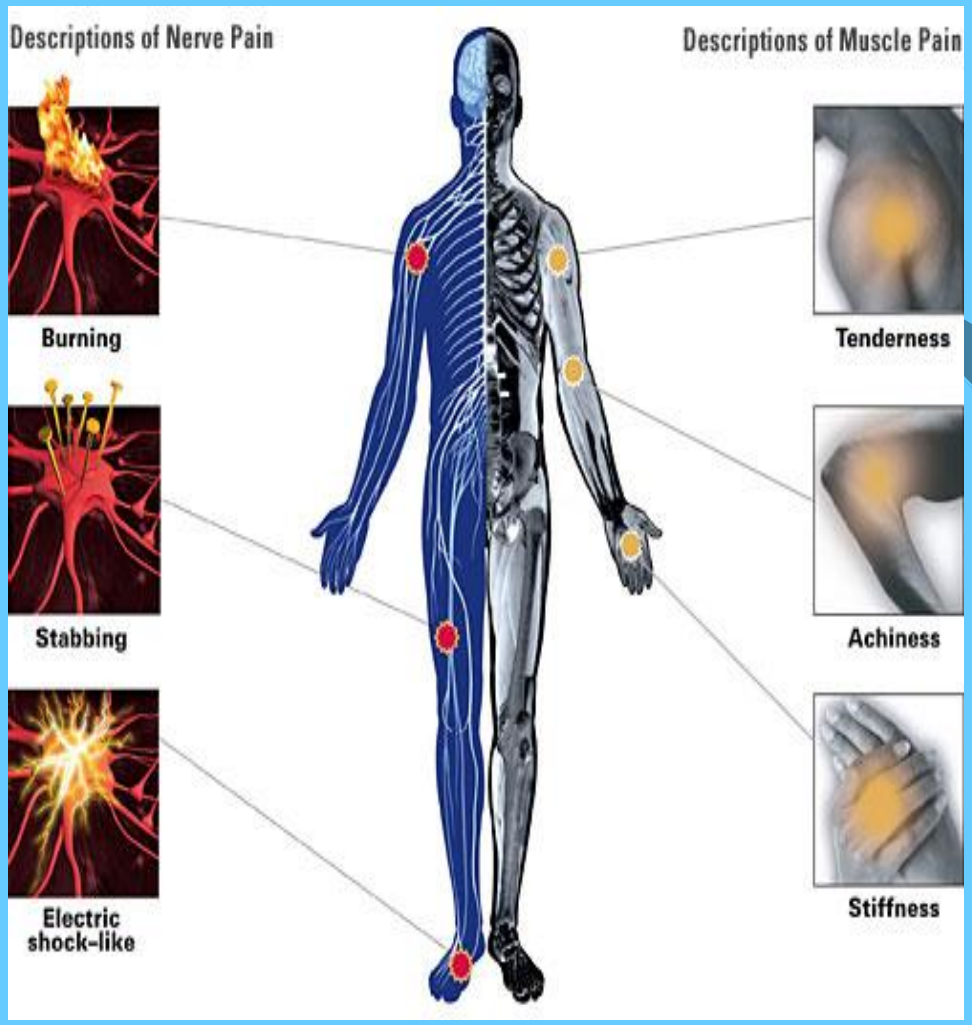
   Sperm retrieval and preservation
   In Vivo Fertilisation

Pain

Neuropathic

(Nerve Pain)

Carpal
Tunnel Syn



Musculo-skeletal

Fracture site

Chronic Pain team

Psychological Problems

Anxiety
Anger
Low mood
Frustrations
Depression
Behaviour changes
Relationship issues
Isolation

Psychotherapy

4.Socio-economic Issues

Accommodation

Mobility / Independence

Life does not stop after SCI

It is different

Holidays

Family and Care

Recreation

Employment & Benefits

Spinal Rehabilitation

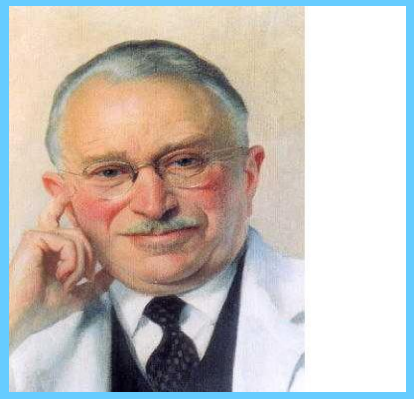
- **Goal is to make maximum use of the remaining functions to achieve the highest degree of independence permitted by the neurological lesion and reintegrate into the community.**

Multidisciplinary Team:

- Medical team
- Physiotherapist
- Occupational therapist
- Nursing team
- Psychologist
- Case Manager
- Social Services team

Take Home Message

* **Systemic Disorder.**
* **Long term condition.**
* **Management in the early stages affects the overall outcome.**
* **Early discussion with Spinal Centres improves long term outcome.**
* **Life does not stop after SCI it is different**



**** Successful rehabilitation is one where an individual is admitted as a patient and discharged as a tax payer.****

Sir Ludwig Guttmann

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North West Regional Spinal Injuries Unit Education Day, Southport

17th March 2015

Prevention of Chest Infections and Weaning in SCI

Aimi Forrest and Mark Bevan

Respiratory Specialists

NWRSIC

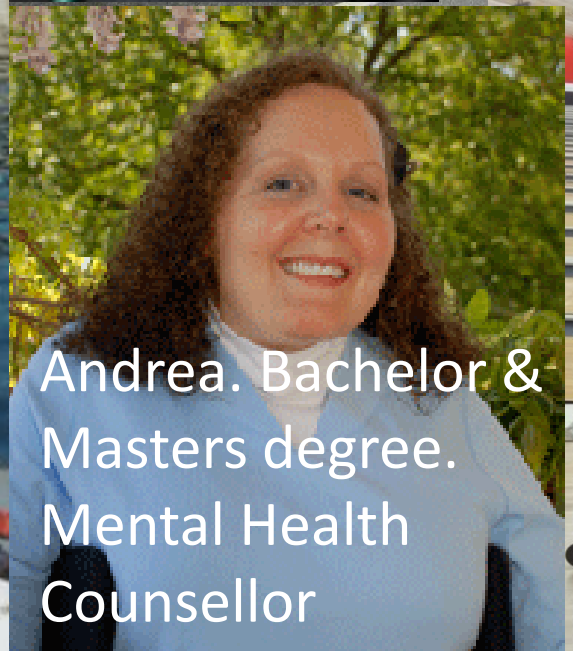
Introduction

- Worldwide SCI mortality is from resp system failure
  - Especially in tetraplegia (1,2,3,4,5)
  - More complete injuries (6)
- Ascending level correlates with ↑ RTI (6,7,8,9) probably due to more RMW.
- Exp muscles usually more compromised than insp muscles – innervation levels (10, 11)
- Studies group other neuro conditions together, but often insp and exp muscles equally affected.
- ExpMW impairs cough → mucous retention, atelectasis, pneumonia, RF; so ↑s morbidity, mortality & health related costs (12, 13, 14, 15, 16, 17).

Jamie. Ex pro cricketer. Now coaches & loves holidays abroad.

Matt King OBE, lawyer, charity worker.

Debbie. Mouth painter. Disabled advocate & speaker. Early assistive technology adopter. Operated Sip-n-puff controls for sailboats.



Andrea. Bachelor & Masters degree. Mental Health Counsellor

Bill. Disabled sports manufacturer. Bowler. Fundraiser.

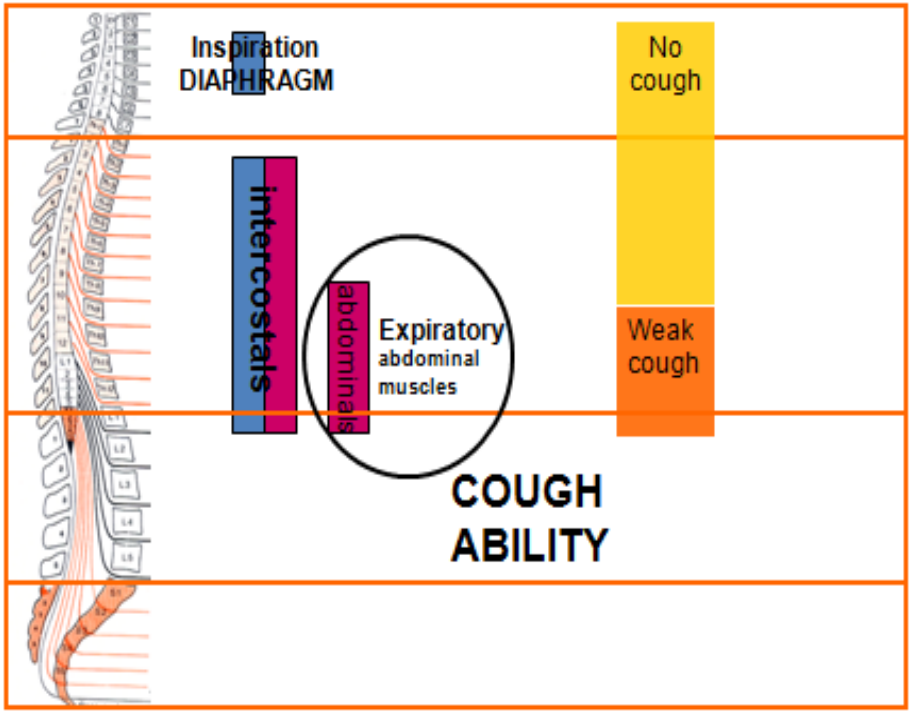
Acute Respiratory Problems

- Unstable cervical spine & risk of worsening neurology
- Haemodynamic instability e.g. hypothermia, bradycardia, hypotension. Spinal shock.
- Acute neurogenic pulmonary oedema
- Impaired inspiration – loss of respiratory musculature (respiratory pump), ?flail segments?
- VC monitoring important - self vent or vented pts.

Acute Respiratory Problems

- Direct trauma to airways
- 2^{o} trauma to airway – ETT/trachy/fixation complications
- Aspiration risk
- Loss of effective cough – muscle loss/ decreased exp pressures (ETT/Trachy)
- Pain, pain meds, sedation.
- ?brain injury – ability to follow commands
- Parasympathetic tone (discussed later)

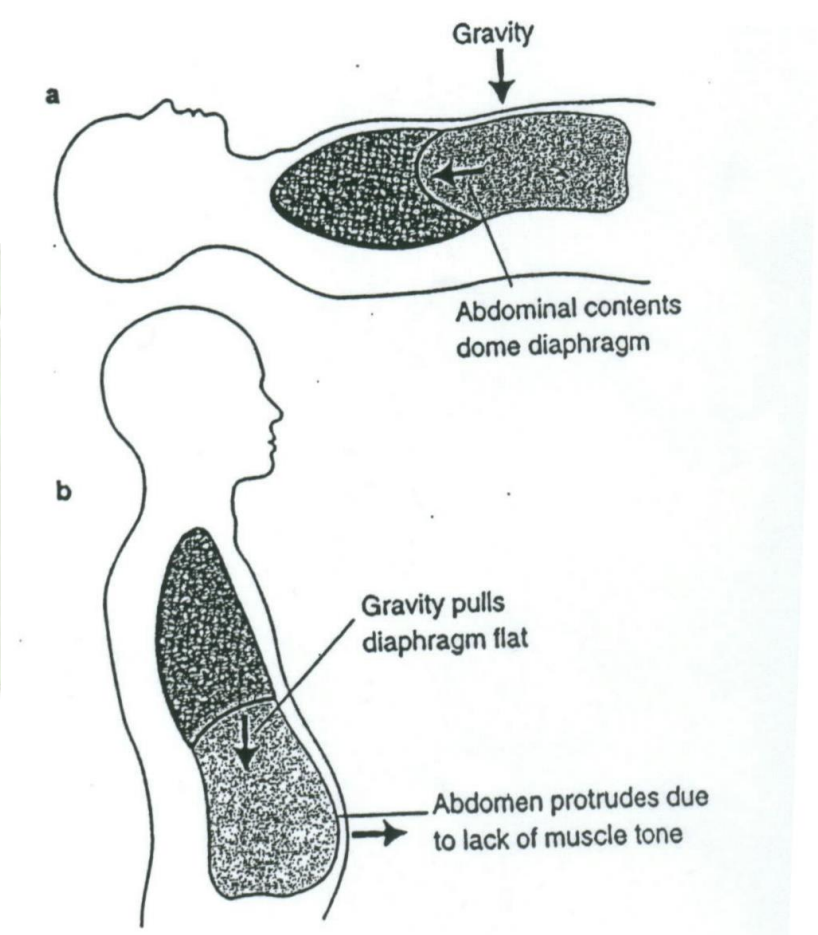
Muscles of Respiration



Muscles of Inspiration with corresponding Spinal Innervation Level	Muscles of Expiration with corresponding Spinal Innervation Level
Sternomastoid – Accessory XI, C1, C2.	Pectoralis Major – C5 – T1
Trapezius – Accessory XI, C1, C2.	Lateral Intercostals – C8-T11
Diaphragm – C3-5	Abdominals – T6-L3 (note variation)
Scalenes – C4-8	
Lateral Intercostals – C8-T11	

Adapted from Estenne and De Troyer, 1990; and Schilero et al, 2009. (18, 11).

Effect of Position on VC & Treatment



Wright's Respirometer (Ferraris)

Tend to use Mark 14 or Haloscale. (Others acceptable).

http://www.nspirehealth.co.uk/default.asp?LINKNAME=RESPIROMETERS (UK office & aftercare)

http://gracemed.net/Wright_Respirometer.html (refurbished)

This two person method is preferred if spinal stability is a consideration as both people are pushing bilaterally which will minimise rotation. Stand on either side of the bed. Each person places one forearm across the upper abdomen of the patient with their other hand on the upper or lower ribs of both sides of the chest. As the patient attempts to cough, push inwards simultaneously.

Single person technique: spread your hands anteriorly around the lower rib cage and upper abdomen. With your elbows extended push inwards and upwards with both arms as the patient attempts to cough. Arms must be kept extended for this technique to work effectively, it may therefore not be appropriate to use if the patient's bed does not lower to a suitable height.

Manual Assisted Cough in Tetraplegia (MAC)

- Prospective controlled trial of 40 motor complete tetras (19)
- Mean VC 47.8% predicted in sitting, rose to 61.3% in supine
- Differed from DMD as MAC significantly ↑d PCF (peak cough flow) compared to BS (breath stacking)
- Probably due to no abdo innervation to aid unassisted cough!
- BS with MAC produced significantly better PCFs ($p<0.001$)
- Again optimisation of insp with BS improves MAC & PCF

Mechanical Insufflation/Exsufflation

- Testing of MI:E on artificial lungs showed that to achieve PCF >160L/min, P°s need to be at least 30 to -30 cmH2O (21)
- At 40 to -40 cmH2O, only 248 L/min may be achieved.
- This is far less than a normal healthy cough, but larger than normal exp vols may be achieved.
- Lung compliance & airway resistance would affect results

- Suggest P°s & time adjusted for max insufflation & quick exsufflation
- MAC during exsufflation may improve results
- They note no volutrauma has been reported with P°s of 60 to -60 cmH2O, so these warrant further study.
- Many studies use poor P°s
- Paucity of any good studies on SCI!!!

Manual Hyperinflation & Suction

- MHI & suction on turns is recommended in acute stage – check safety (e.g. high PEEP dependency)
- Check that chest movement is more than that on vent!
- Ensure sufficient exhalation time…don't rush
- Suction – deep recommended and routine (4hrly or more)…insufficient clearance/patient may not feel secretions (22)

Management of Respiration

Ventilate to normal blood gases unless there is chronic underlying lung morbidity. Provide humidified supplemental oxygen, particularly in the acute phase, to ensure that the cord is kept oxygenated and reduce the risk of further damage.

Impaired inspiratory capacity

1. Decreased respiratory muscle strength and fatigue
2. Paradoxical chest wall movement causing an increase in effort of breathing
3. Decreased inspiratory capacity
4. Atelectasis
5. Chest wall rigidity

Retained secretions and development of mucus plugs

1. Increased secretion production
2. Decreased cough effectiveness

Autonomic nervous system dysfunction

1. Increased secretions
2. Bronchospasm
3. Pulmonary oedema

- For high injuries ~40 – 60%* of patients will develop atelectasis particularly in the left lower lung.
- Pneumonia is common in acute spinal injuries in the first 3 – 5 days
- Early tracheostomy if appropriate
- Cuff leaks, assisted devices to allow speech

Parasympathetic tone

- “Increased” tone with injuries above the T1 level
- Bronchoconstriction, narrowing of the airways/Sub-clinical bronchospasm
- Increased mucus production via bronchial mucus glands
- Increased viscosity of the mucus
- Nebulised bronchodilators
- Mucolytics carbocysteine/Nebulised hypertonic saline

Prevention of Atelectasis

- Management of atelectasis is the cornerstone of early SCI respiratory care.
- Decreased inflation of the alveoli also leads to a significant reduction in the release of surfactant, which further contributes to atelectasis .
- Atelectasis may worsen over the first few days as respiratory muscles fatigue, secretions accumulate and lung compliance decreases.

Ventilatory strategies

- High volume ventilation to prevent atelectasis 10-20ml/kg
- ARDS net 6-8mls/kg insufficient, none of these studies involved SCI and weaning.
- High levels of Positive-end expiratory pressure (PEEP) is not recommended because of the lack of studies showing the effectiveness of PEEP in treating atelectasis in acute SCI.
- Pressure Assist Control Ventilation
- Use large Vts rather than PEEP due to position of diaphragm & surfactant production.

Weaning

- Ventilator Free Breathing
- The VFB weaning method is applicable when the patient is stable, infection free, with minimal positive end-expiratory pressure (PEEP) or oxygen dependency.
- It consists of gradually increasing periods of breathing humidified, oxygen enriched air independently of the ventilator.
- The permitted length of time is matched to the vital capacity (VC) as measured with a Wright's respirometer.
- Position – don't sit up/out as increase work of breathing.

- The session is curtailed if the VC drops below two thirds of the starting value, or the patient appears distressed.
- In between, the diaphragm is rested using a controlled ventilation mode ensuring a tidal volume delivery of 10–20 ml/kg.
- The other components of the weaning schedule are tracheostomy tube cuff deflation during VFB.
- The use of a speaking valve or an occlusive bung on the tracheostomy tube.
- Guidelines can be found on SDGH website via ‘about us & our services’ ‘spinal injuries centre’ ‘spinal cord injury care’ ‘ventilator dependence & weaning’ ‘outline of weaning protocol’

We welcome you contacting us for guidance. Thankyou.

To Conclude…

- Atelectasis is not our friend!
- Optimise positioning
- Pharmacology
- Ventilation
- Aggressive secretion management
- All via a team approach – Drs, nurses, physiotherapists, SALT, dieticians.

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North West Regional Spinal Injuries Unit Education Day, Southport

17th March 2015

CARDIOVASCULAR COMPROMISE

North West Regional Spinal Injuries Centre
Southport & Ormskirk NHS Trust

CARDIOVASCULAR COMPROMISE

Cardiovascular complications in the acute stage following spinal cord injury require prompt medical attention to avoid neurological compromise, morbidity and death.

- Neurogenic shock
- Bradycardia
- Potential for DVT/PE
- Hypotension
- Autonomic dysreflexia
- Hypothermia
- Cardiac arrest (rare)

NEUROGENIC SHOCK

North West Regional Spinal Injuries Centre
Southport & Ormskirk NHS Trust

Neurogenic shock

- Neurogenic shock occurs during the acute phase and can last up to six weeks
- It is a transitory suspension of function and reflexes below the level of injury.
- Individuals with cervical cord injury may present with a bradycardia of 45-60 and a systolic of 80-90

Neurogenic shock

- In the absence of clearly established and significant blood loss, any fluid replacement should be moderate

- Increased production of ADH results in fall in urine output (30-50mls per hour produced)

- Temperature

BRADYCARDIA

Bradycardia

- Bradycardia is a result of the disruption of spinal pathways leading to reduced overall sympathetic activity and unopposed parasympathetic activity.

- Atropine should be kept readily available at the bedside
- Salbutamol nebulisers

- EWS – Baseline observations and vigilance
- Anticipation and documentation of triggers

Bradycardia

TRIGGERS

- Tracheal suction
- Prolonged flat bed rest
- A rapid change in position
- Positioned on the left side for prolonged periods of time
- A cervical collar that is applied too tightly ,may induce syncope
- Adverse drug effects
- Underlying infection
- Hypovolaemia

DEEP VEIN THROMBOSIS

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Deep Vein Thrombosis

- The risk of DVT is highest within the first two weeks of injury.

- The incidence of DVT and PE in patients with complete spinal cord injury is three times higher than that of the general public

- DVT can occur during either the acute or chronic phase of SCI, despite anticoagulation therapy

Deep Vein Thrombosis

- After SCI, prophylactic treatment is usually recommended for 3 months, dependent on individual circumstances
- A Doppler scan ordered If DVT is suspected and anticoagulation therapy reviewed.
- EWS to monitor temperature
- Awareness of signs and symptoms of PE

HYPOTENSION

Hypotension: Signs & Symptoms

- Visual disturbance
- Tinnitus
- Pallor
- Tachycardia
- Low temperature
- Dizziness
- Sweating

Hypotension: Signs & Symptoms

- Loss of balance
- Faints
- Mild confusion
- Nausea / vomiting
- Dilated pupils
- Unresponsiveness
- Difficulty in breathing

Hypotension : Management

- Sitting up slowly and in stages
- Abdo binders /TED stockings/flotron boots (Prevents pooling of blood in the abdomen and lower extremities)
- Tilt chair backwards
- Raise legs
- A reclining wheelchair with elevating foot rests

Hypotension : Management

- Produce a spasm by pulling the legs apart
- Encourage patient to move arms if possible
- Rub calves of legs (Stimulates circulation)
- No large meals just prior to getting up in chair
- Check temperature
- Return to bed if no improvement

Hypotension : Management

- Ephedrine 15 – 30mgs prior to getting up (Dilates bronchial passages. Therefore allows increased O2 into the circulation and constricts blood vessels - causes increase in B/P)

- Midodrine

- Symptoms usually improve with management and over time

THANK YOU

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17th March 2015

Joined-up recovery:

“soft skills” are everybody’s business

Dr. Dominic Bray
Consultant Clinical Psychologist
North West Regional SIU

Dominic.Bray@nhs.net

Think *Robinson Crusoe* .....

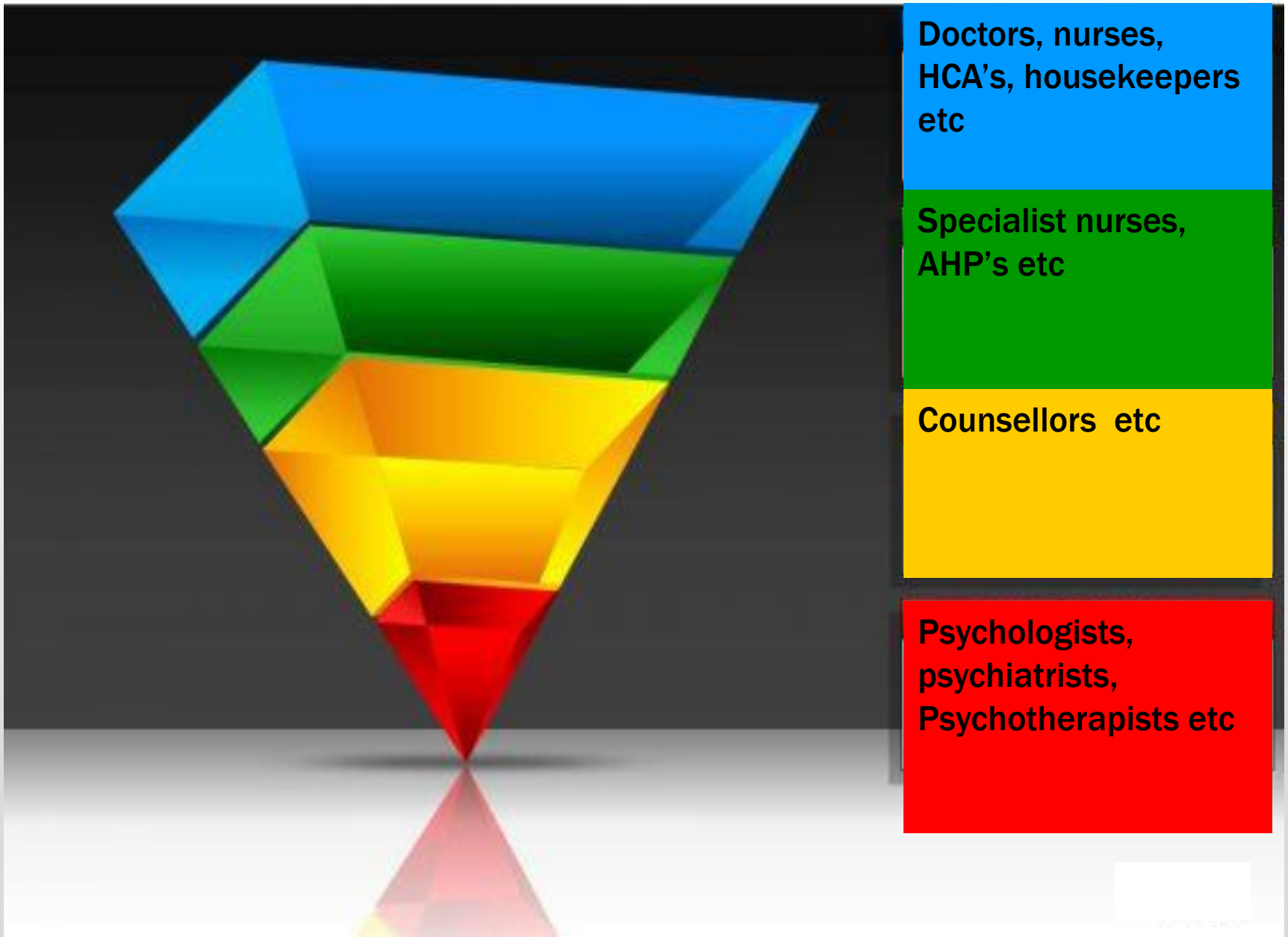
September 30, 1659.

I, poor miserable Robinson Crusoe, being shipwrecked during a dreadful storm... came on shore on this dismal, unfortunate island, which I called the *Island of Despair*, all the rest of the ship's company being drowned, and myself almost dead.

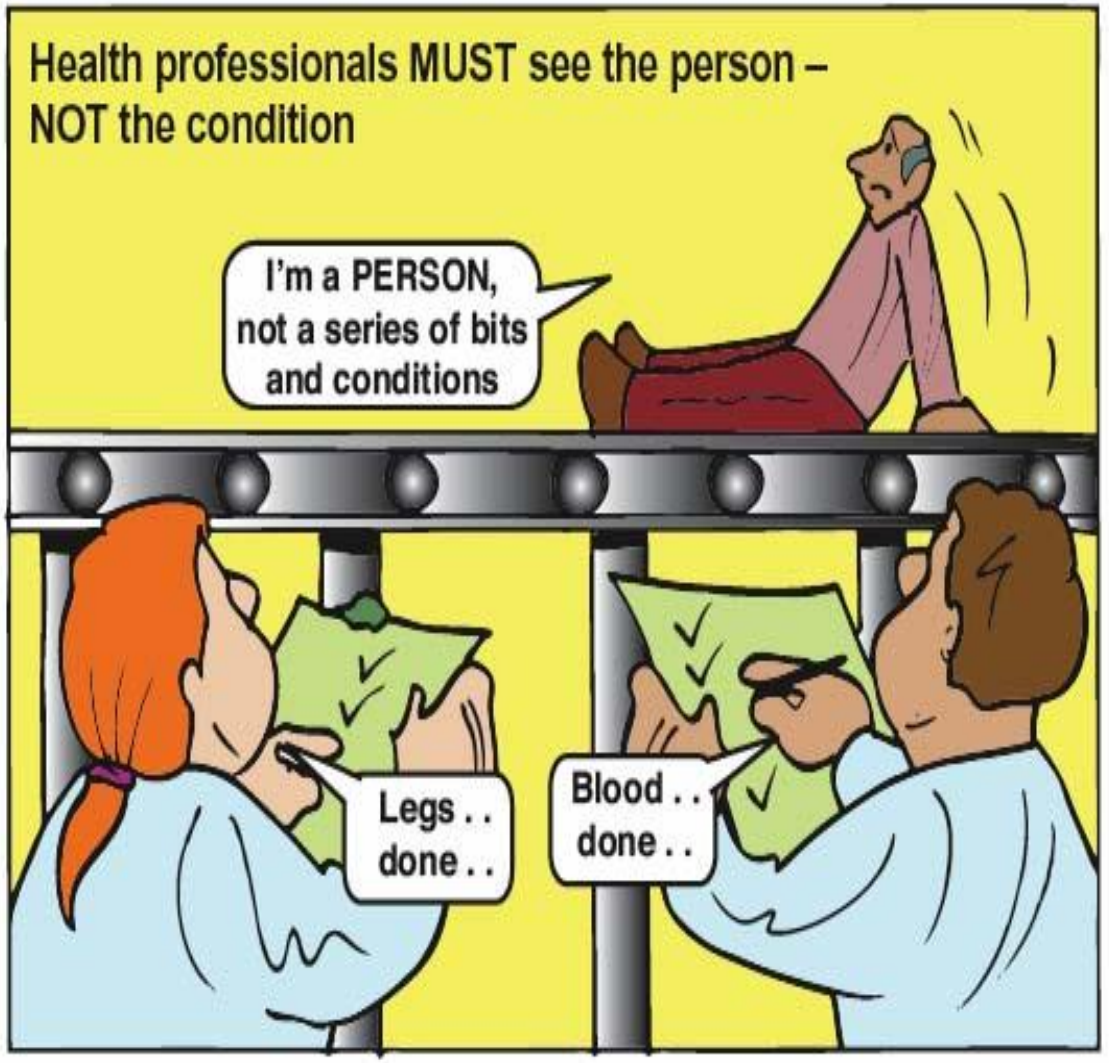
Think *Robinson Crusoe* .....

- trying to find meaning - why me?
- seeking safety - retreating into a cave
- storing one's reserves - doing as little as possible
- counting the days - time seems very different
- hoping and waiting to be rescued - and the ensuing disappointment
- sinking into loneliness and depression.

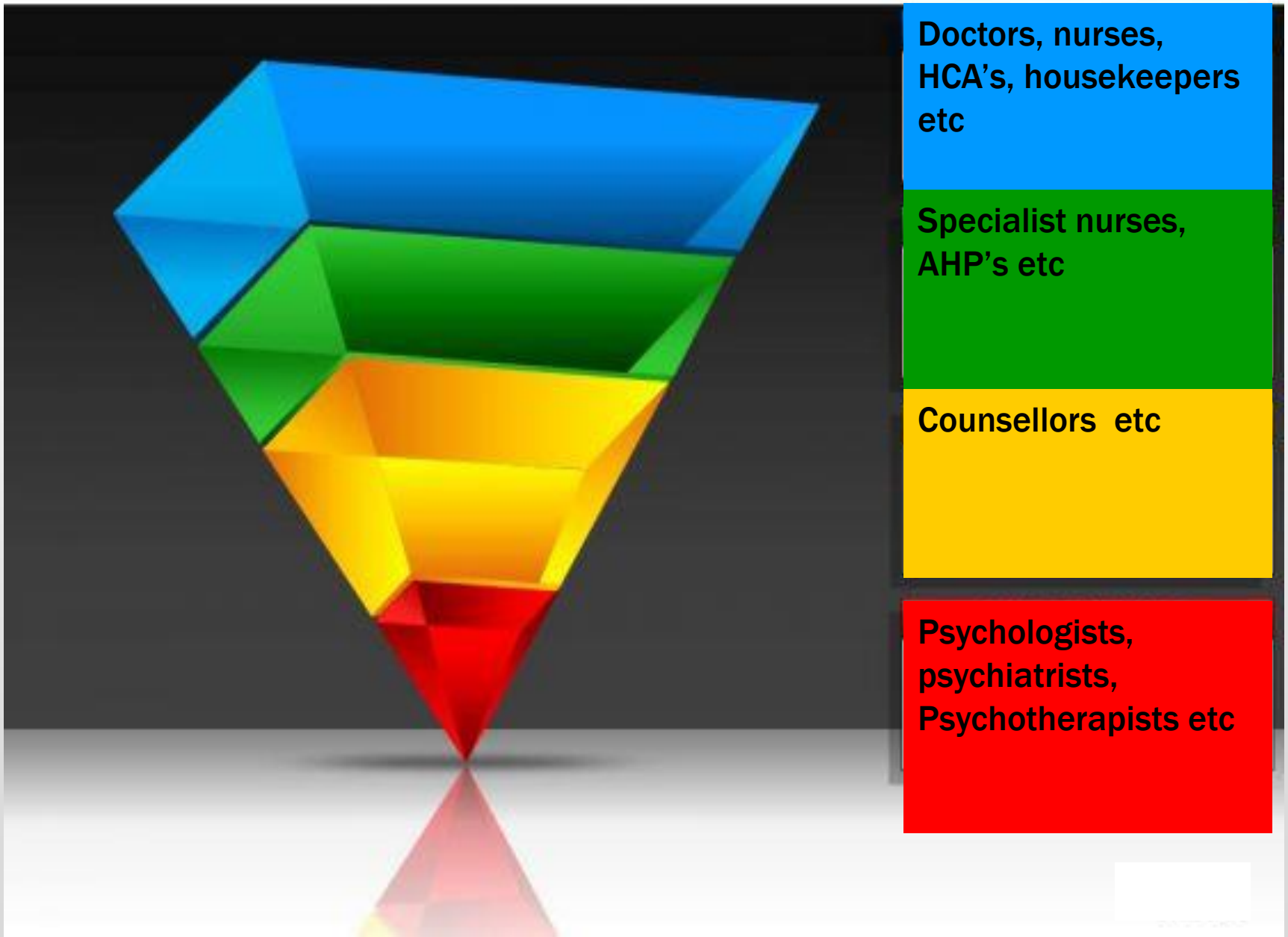
3D Pyramid – Inverted



How does this feel to the patient?: the 'factory' model of care and repair'



3D Pyramid – Inverted



Essential “Soft skills”

Personalised ‘goals’: if you don’t know where the hole is……

Essential “Soft skills”

Personalised ‘goals’: times are a-changing

coalition for collaborative care
ACTION FOR LONG TERM CONDITIONS

NHS England

Personalised care and support planning handbook:

The journey to person-centred care

Executive Summary


Please
don't flush
Nappies, sanitary towels,
paper towels, gum,
old phones, unpaid bills,
junk mail, your ex's sweater,
hopes, dreams or goldfish
down this
toilet

Is their medication ending up where it should be?

Dysphagia, or swallowing difficulty, is a much more widespread problem than you might think.[1] It leaves many people, especially the elderly, struggling to swallow their medicine and often leads to it being thrown away.

Such non-compliance has serious consequences in that it can lead to poor outcomes, hospitalisation or even patient death.[2] It also costs the NHS over a billion pounds a year in wasted medicines and the costs associated with adverse clinical outcomes.[3]

That's why it makes sense to give people who can't swallow solid medicines a more appropriate formulation such as a liquid - and the sooner this is done the greater the difference it can make in terms of improved compliance and patient welfare.

Rosemont specialise in liquid medicines offering solutions across a wide range of therapeutic areas.

CONCORDANCE not compliance

Rosemont™

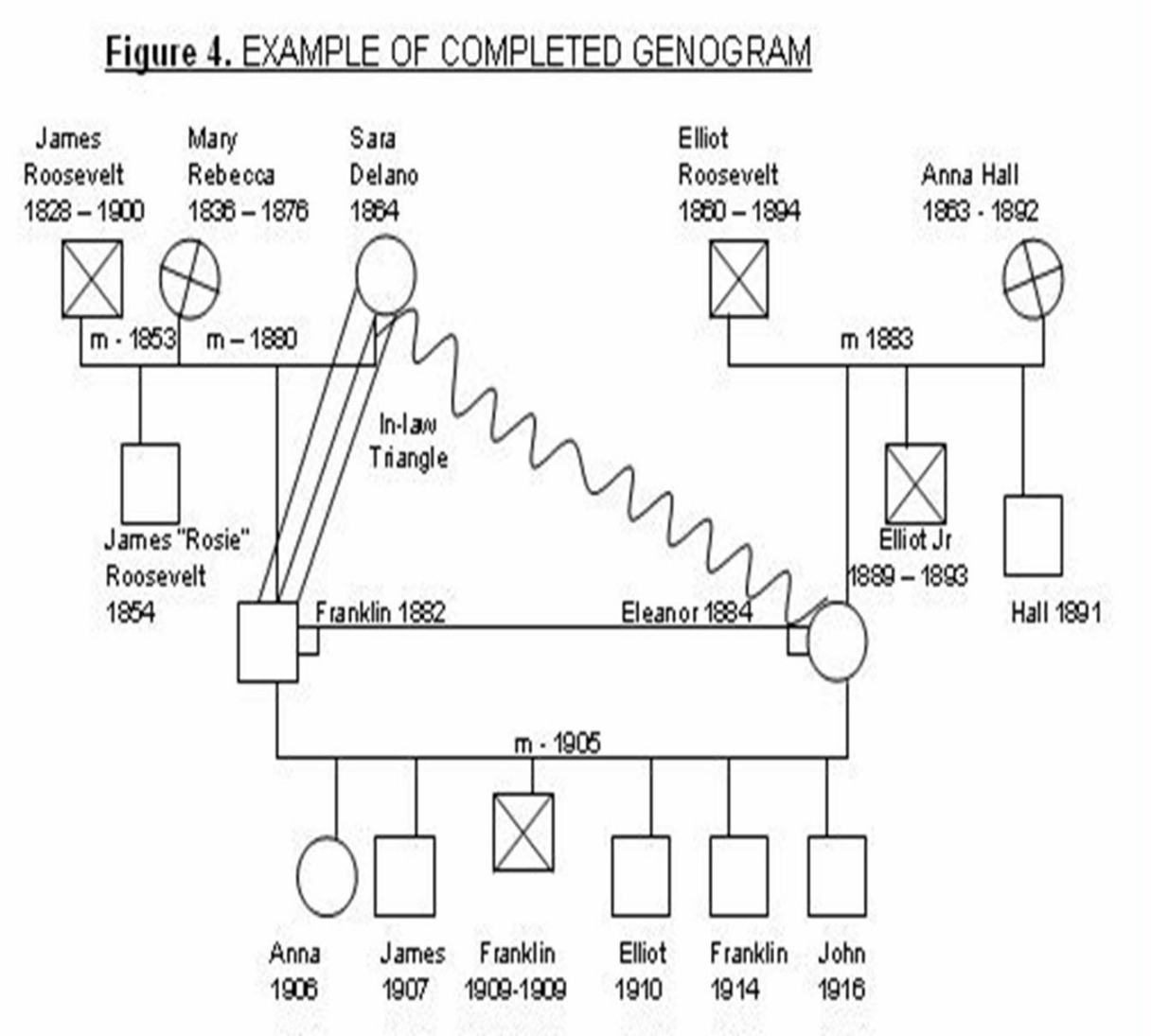
References:

Essential “Soft skills”

Personalised ‘goals’:

- What’s / who’s important?
- If we could meet in a year’s time….
- ……suppose later today…..?
- What do you do with you life……?
- If we *could* cure you….?

Essential “Soft skills”



Essential “Soft skills”

“The person’s own solutions” / “renewable energy”

- What do you do with your life (e.g. when not in bed)?
- How have you got thru things in the past? (NB not what have you got thru in the past?)
- What’s a good day look like in here?
- Who would be the least surprised if you got thru this?
- How would your spouse/family/best friend/dog describe your qualities?

But I don’t have the time to do this?

- Try it and see, next time you are changing an IV fluid bag or handing medication to a patient. Try some of these suggestions…

So what about Robinson…what happened to him?

- Robinson had setbacks all along the way
- A turning point was when he began to explore the island and although his sense of abandonment increased, he started noticing some tiny positive aspects.
- he realised that he had to do something for himself

Who to contact if you are seriously concerned about a patient?

- Contact the psychology service within your hospital. Most will have a clinical health psychology team. Failing that contact your hospital's psychiatric liaison team.
- We are able to provide limited over the phone consultation support, but cannot offer outpatient psychology visits
- If a patient has had psychological or psychiatric support whilst at your centre, please can you ensure we are notified prior to the patient admission so that a handover is in place

Any Questions

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North West Regional Spinal Injuries Unit Education Day, Southport

17th March 2015

A little food for thought

These are the lives that can be led if WE get it right from the outset

There really is a life after Spinal Cord Injury !

SPASTICITY, POSITIONING AND SPLINTING

JULIE JONES – OCCUPATIONAL THERAPIST

VICKY THOMAS – OCCUPATIONAL THERAPIST

LAURA SLATER - PHYSIOTHERAPIST

Aims of the presentation

- To look at **spasm**; the benefits/adverse effects, the effect on patients' functional independence, and how therapists can try and help with the management of it.
- To discuss **passive movements** – why we do them and things to consider when carrying them out
- To discuss **positioning** of the limbs and how good positioning is essential.
- To talk about **splinting**, why we do it and the different types of splints used.

Spasticity:

- The majority of spinal cord injured patients will at some point have some degree of spasm that may or may not impact on their activities of daily life or their ability to actively engage in their treatment and rehabilitation.

What can trigger a spasm?

- Almost anything but common triggers are infection, distended bladder/blocked catheter, movement, stretching of a muscle, poor positioning and extremes of temperature.

Is spasm necessarily a bad thing?

- In spinal cord injury spasm tends to ‘come with the territory’ but, as with everything else, some people are able to utilise it to their advantage.

The benefits of having spasm include:

- May maintain/increase muscle bulk helping to reduce negative body image
- Increase venous return
- Facilitate the performance of standing, transferring, functional grip and some activities of daily life
- May alert the individual to the possibility of an underlying medical problem such as urinary infection, ingrowing toenails, constipation, pressure sore, broken limb – all of which they might not be aware of.

The adverse effects of having spasm include:

- Poor posture.
- Difficulty in taking a deep breath
- Potential to cause skin problems through friction.
- Compromised safety
- Reduced quality of life
- Negative self image

They also include:

- Pain
- Fatigue
- Restricted ability to perform activities of daily life.
- Loss of range of movement and potential to develop contractures.
- Disturbed sleep
- May be confused as recovery

Therapy treatments to try and aid with the management of spasms:

- Posture and Seating:
  - The type and severity of spasm will influence how the patient needs to be seated. Someone with extensor spasm may require to be seated with the hips and knees flexed to more than 90 degrees to prevent spasm from being triggered. Lateral support will be required if sideways truncal spasm is present.

  - The Occupational therapist will spend a considerable amount of time assessing patients' seating needs in order to ensure that a good posture is maintained and spasm is reduced as much as possible to enable the patient to function, maintain range of movement, prevent contractures and minimise the risk of developing pressure sores.

Therapy treatments to try and aid with the management of spasms:

- Maintenance of joint range of movement and prevention of contractures
  - Passive movements
  - Splints

- Standing regime
  - Clinical Guidelines for standing adults following spinal cord injury, Multidisciplinary Association of Spinal Cord Injury Professionals (MASCIP) 2013 http://www.mascip.co.uk/Core/DownloadDoc.aspx?documentID=9311

Treatments to help with the management of spasms:

- Use of oral baclofen

  - The administering of medication can alleviate the worst effects but the side effects can make the individual so drowsy that they are unable to actively engage in their treatment and rehabilitation activities.

  - It also needs to be taken into account that baclofen will relax **all** muscles and may have an effect on function.

  - Need to discuss the use of this with the whole of the MDT.

Treatments to help with the management of spasms:

- Use of botulinum toxin
  - Spasticity in adults: management using botulinum toxin, National guidelines (2009)

  https://www.rcplondon.ac.uk/sites/default/files/documents/spasicity-in-adults-management-botulinum-toxin.pdf
  - The decision to use botulinum toxin is a joint discussion with the whole of the MDT.
  - Aim is to decrease muscle contraction, injected intramuscularly
  - Post injection – therapy staff need to monitor for the effects of botulinum toxin to occur (generally 7-14 days post botox) and then need to see if splints are required and increase passive movements.

Effect of spasm on functional independence:

- Functional independence can be directly influenced by the presence of spasm. As we have said before, spasm can be useful if it can be initiated and controlled by the individual and some patients can learn to utilise it to good effect.
  - E.g. bed transfers – individuals can initiate extensor spasm in the legs enabling them to lift and swing them up onto the bed and to stand for short periods to perform pivot transfers.
  - E.g. lying to sitting – Initiating flexor spasm in the abdominal muscles may assist with this.

To summarise:

- Spasm affects peoples lives and their ability to carry out everyday functional tasks. When spasms are problematic the person's ability to achieve independence is likely to be limited and the appropriate method of treating/minimising its adverse effect has to be balanced. By educating the individual about spasm and what triggers it the individual should be able to direct how they need to be positioned and handled in order to minimise the effect.

- In certain instances spasm may naturally reduce over time and/or the individual learns to cope with it better.

- Although the impact is not always adverse, for the majority of people it is an added complication.

Passive Movements:

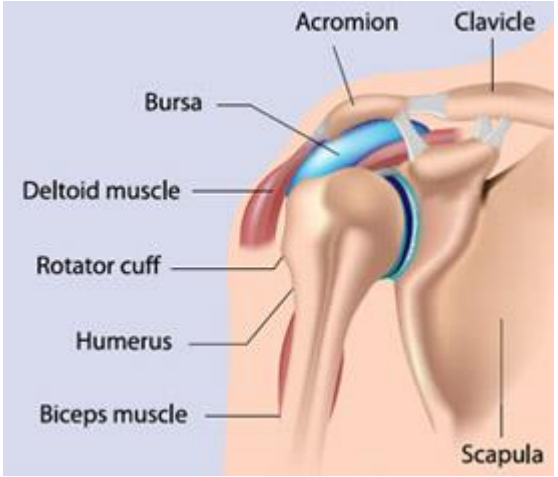
- Passive movements to the paralysed limbs are essential to help maintain range of movement in joints and soft tissue and to promote circulation (Bromley 1998).
- Maintenance of good range is important as limited joint range and soft tissue contractures prevent good functional positioning (Cash 1998).
- Passive movements will also facilitate the carer with washing, dressing, transferring and positioning of the patient comfortably in the bed and wheelchair.
- Also passive movements can help maintain the patient's good appearance and posture.

Things To Consider When Completing Passive Movements:

- Restrictions following SCI/ surgery
- Position of the patient
- Dignity
- Manual handling
- Decreased sensation
- Spasms
- Autonomic Dysreflexia
- Handling of a paralysed limb
- Skin
- Risk of DVT's

Shoulder Pain:

- 25-73% of patients will have an episode of shoulder pain after SCI injury.
- Around 75% of individuals with SCI have shoulder pain at some time during their lives, and the rate increases with the number of years since spinal cord injury.
- Shoulder pain can be very debilitating, decreasing a person's independence and decreasing the quality of life.



Shoulder Pain:

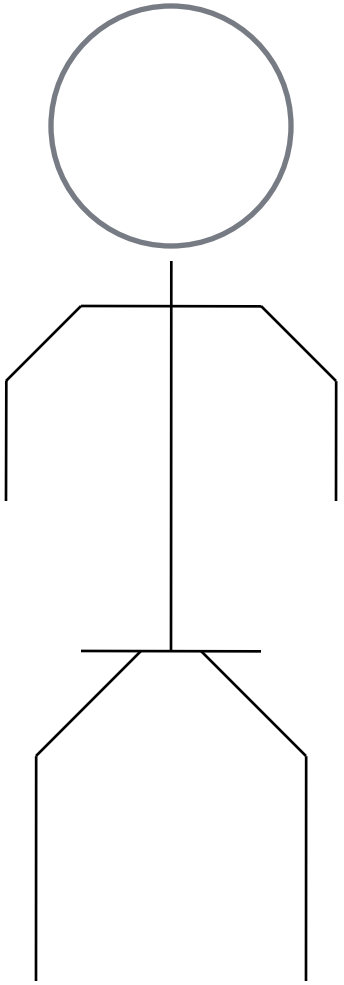
- Possible causes:
  - Muscle weakness due to the SCI
  - Altered muscle tone
  - Trauma during the injury
  - Overuse after your injury (transfers/wheelchair use)
  - General aging process
  - Instability
  - Impingement
  - Capsulitis (Frozen shoulder)

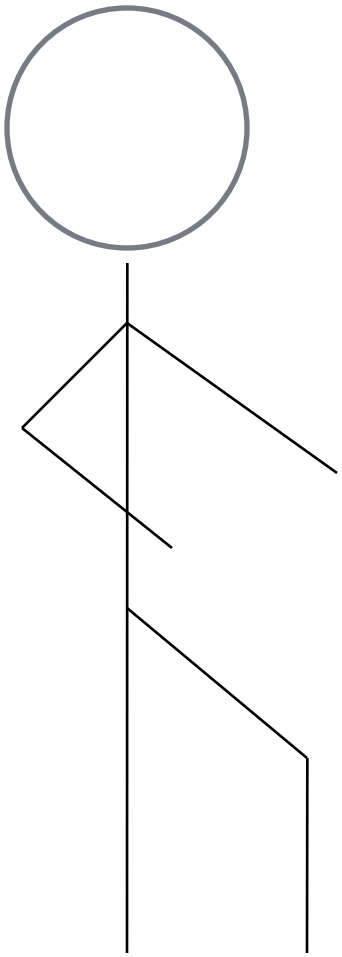
Shoulder Pain:

- How can we help:
  - Inform the Physiotherapist/Occupational Therapist.
  - Optimise the environment.
  - Think about the patients position in bed/in the wheelchair.
  - Exercises if appropriate, to prevent reduced range of movement at the shoulder and to strengthen the shoulder if able.

Positioning:

- In bed:
  - Avoid positioning the patient directly on their shoulder.
  - Regular turns to try and reduce pressure on the shoulders.
  - Avoid positioning the arms on stacked pillows.
  - If possible try and position the arms at the side and slightly supinated.
  - Monitor the tightness of the Achilles tendon/gastrocnemius, is a pillow/splint needed to maintain plantigrade?





Positioning: in the wheelchair

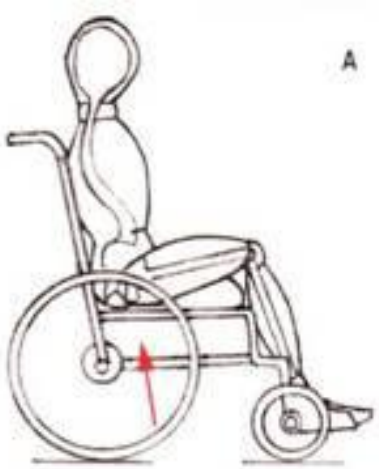
- Start with pelvis:
- Anterior Superior Iliac Spine should be level (observe for pelvic obliquity)
- If pelvis is not stable, this affects rest of body
- Alter footplate height – this assists with stability and distribution of pressure on cushion

Positioning: in the wheelchair

- Then look at trunk – observe for side flexion, lateral supports may be required if this is evident
- Armrests should be at correct height: shoulders should be level, and elbows bent at 90 and supported by armrests, otherwise there may be a risk of subluxation

Positioning: in the wheelchair

- Slight recline may be required for the patient's comfort, but not too much
- Tilt-in-space is essential – provides 'bucket' for patient to prevent sliding forward on cushion if patient has spasm. It also assists in preventing postural hypotension


A


B


C

For Tetraplegic patients: points to consider when getting them up for first time

- Possible low BP
- Spasms
- Comfort
- Posture and upper limb positioning
- Bowels
- Skin

- Ideally, the patient should get up for the first time in a tilt-in-space wheelchair or armchair

Tilt-in-space armchairs:

Must always be used in conjunction with a pressure relieving cushion.

Splinting:

- Flexor spasm is common in the elbow and fingers and can often be prevented by careful positioning of the upper limb, and regular passive stretching but it may be necessary to provide appropriate splints together with information on how and when they should be applied. A contracted limb equates to reduced function and negative body image.

- Ankle and foot splints may be required to prevent foot drop.

- Sheepskin heel cups may also be required to prevent heel sores from developing through friction from the bed sheets if lower limb spasm cannot be controlled.

SPLINTING:

Resting Hand Orthosis: this helps to maintain optimal range of movement and ensure correct positioning during sleep

Neoprene Wrist Support: this helps to maintain wrist in a functional position

Ankle/Foot Orthosis: helps to maintain optimal range of movement and ensure correct positioning during sleep

Progress Elbow Orthosis: helps to maintain optimal range of movement and ensure correct positioning during sleep

Oedema glove: to help reduce swelling. Seams should be to the outer aspect and not to the patient's skin as this may cause marking. Hands should also be elevated.

References:

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- Clinical Guidelines for standing adults following spinal cord injury, Multidisciplinary Association of Spinal Cord Injury Professionals (MASCIP) 2013 http://www.mascip.co.uk/Core/DownloadDoc.aspx?documentID=9311
- Physiotherapy Exercises (2012) *Stretching* http://www.physiotherapyexercises.com/Exercises.aspx?Lang=English
- Spasticity in adults: management using botulinum toxin, National guidelines (2009) https://www.rcplondon.ac.uk/sites/default/files/documents/spasicity-in-adults-management-botulinum-toxin.pdf

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North West Regional Spinal Injuries Unit Education Day, Southport

17th March 2015

Why do we need to move and handle spinal cord injured patients?

Tony Ward
Tim Sutton

North West Regional Spinal Injuries Centre
Southport & Ormskirk NHS Trust

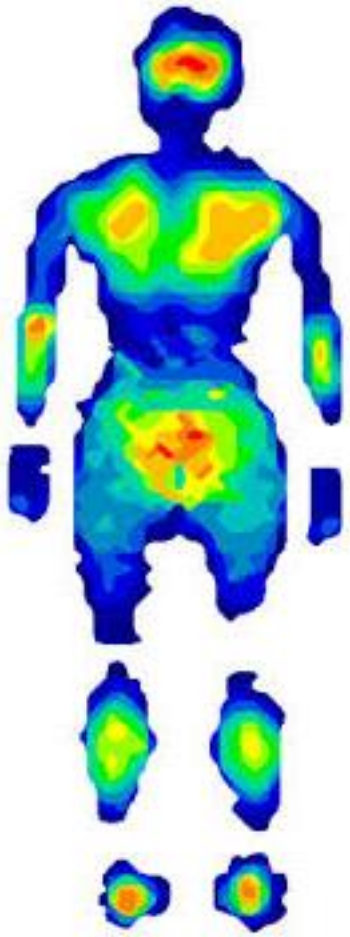
NWRSIC Role


Northumberland
Tyne and
Durham
Cumbria
Teeside
North Yorkshire
Lancashire
W.Yorkshire
G.Manchester
S.Yorks
Mersey
Derbyshire
Cheshire
Staffs

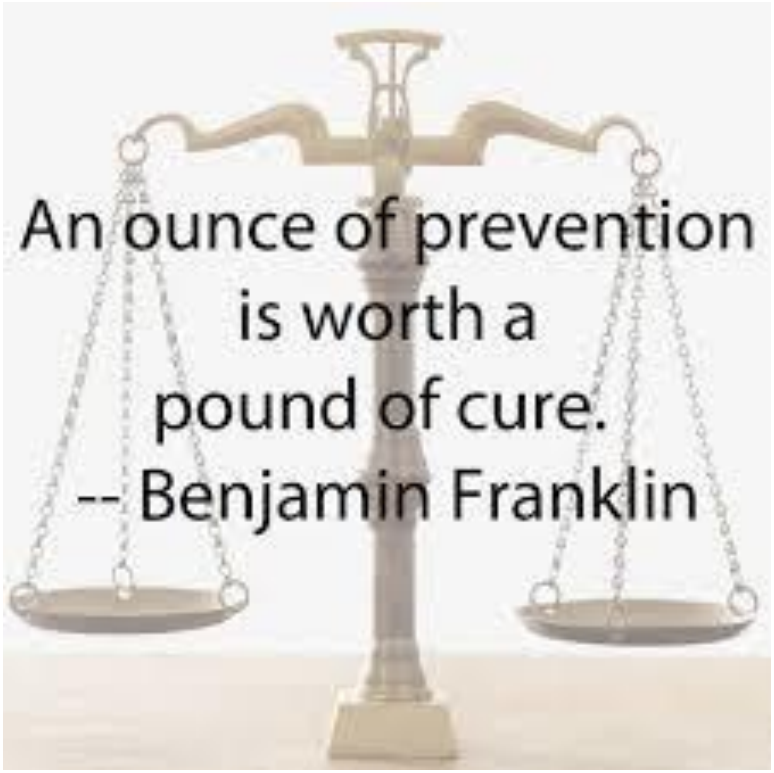
Why Turn?

Frequency

Pressure Distribution



Prevention of Complications



Respiratory Care

Functions of the skin

Why are SCI patients so vulnerable???

North West Regional Spinal Injuries Centre
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"The skin is the biggest affected system after SCI" (Samuel, Stover. 1993)

- Sensory and motor function.
- Sensory and motor loss
- T6 and above injuries - Dysreflexia
- Causative factors
- "No single complication of SCI is as potentially preventable or as difficult to manage as skin breakdown" (Thomas 1977)

Effects Of Spinal Cord Injuries On The Skin.

North West Regional Spinal Injuries Centre
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- Interruption of nerve pathways causes change in sensation.
- Sensations usually recognised as pressure, sharpness, hot/cold are felt differently or not at all.
- Lack of mobility or decreased mobility results in pressure not being relieved as it would with normal mobility. Therefore pressure sores may develop.
- Excessive spasticity creates abrasions and shearing damage to the skin as it is rubbed against bedding, clothing & wheelchair parts

Cont…

- Flaccidity leads to muscle wasting, thereby decreasing the vitality and resistive capacity of the skin.

- Compromised blood circulation leads to a decrease in the amount of oxygen and nutrients reaching the cells.

Implication Of Loss Of Sensation.

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Regional Spinal
Injuries Centre
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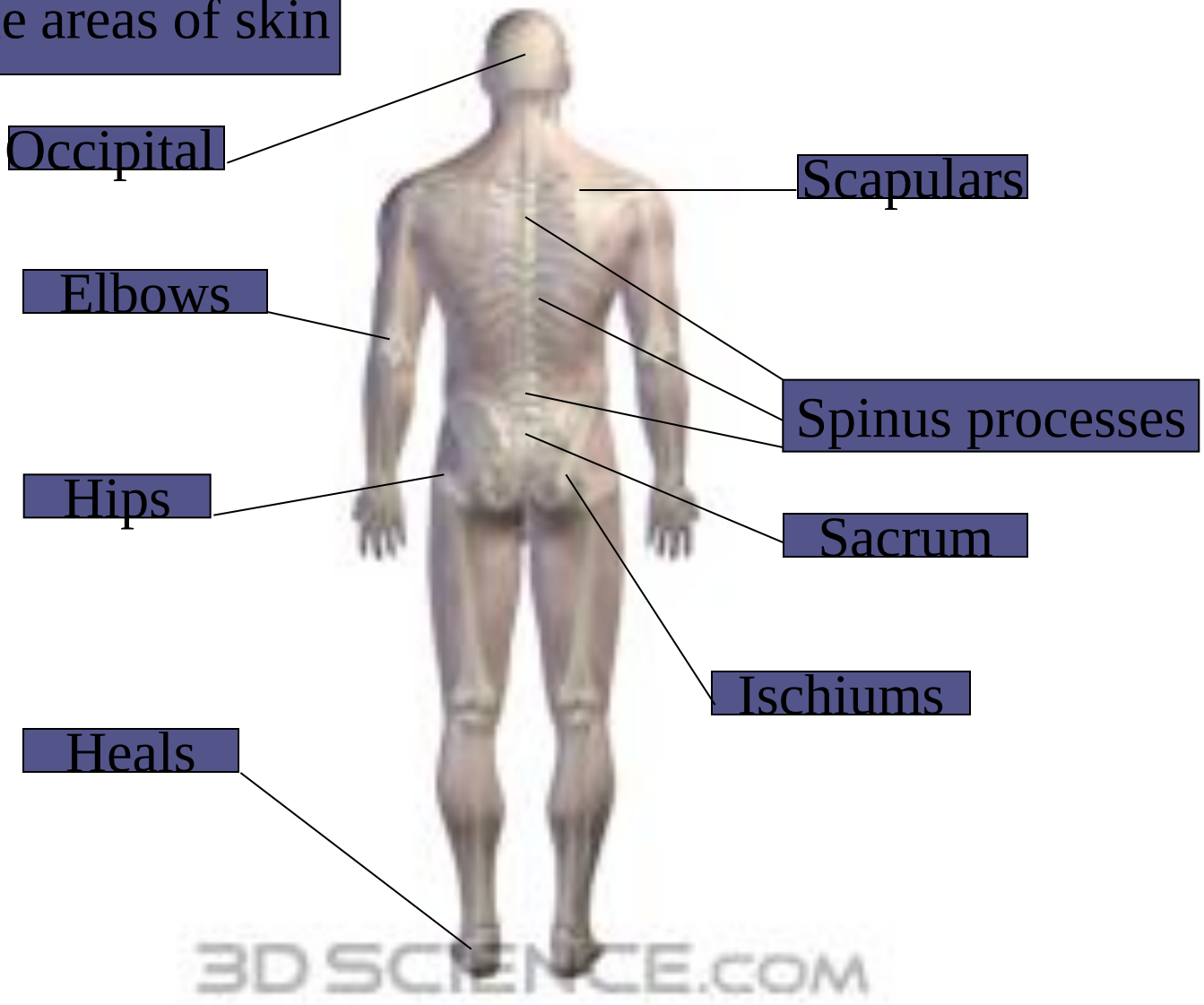
Trust

- Nerve endings in the skin transmit messages involving temperature and pressure. This gives us an awareness of our surrounding environment, therefore enabling us to protect ourselves.

- For example sensation of burning, sharp objects or prolonged pressure which could damage the skin if undetected.
- Pins &needles will occur if prolonged periods of pressure prevent the skin from getting an adequate blood supply.

- **These warning signs can be lost following spinal cord injury. Therefore actions to prevent damage to the skin need instigating.**

Vulnerable areas of skin



Preventing skin breakdown

North West Regional Spinal Injuries Centre
Southport & Ormskirk NHS Trust

1 The use of a pressure relieving mattress if appropriate. Routine checking and servicing of mattress to ensure optimum functioning.

2. Frequent and correct changing of position in bed.

3. Pressure relieving cushions on the wheelchair, and vigilant checking to ensure cushion and wheelchair in good condition before transfer.

4. Pressure lifts if able.

Preventing skin breakdown

5. Altering backrest position help to ensure all areas of the skin receive an adequate blood supply and so help to prevent skin breakdown.

6. Vigilant checking of skin for pressure marks, ensuring any marks that do occur remain pressure free.

7. Good skin hygiene.

8. Referral to podiatrist for nail care.

9. Ensuring a good nutritional intake by eating a balanced diet and adequate fluids.

Neutral Position

Side Lying position

Recognising compromise to skin integrity

North West Regional Spinal Injuries Centre
Southport & Ormskirk NHS Trust

- Frequent monitoring of the skin condition, especially skin covering bony prominences or pressure areas will ensure early detection of any changes.

- Any red marks need checking for blanching to determine underlying capillary and tissue damage. This will allow interventions to be implemented to prevent further damage occurring.

- Consider cause of red mark and remove.

NATIONAL PRESSURE ULCER ADVISORY PANEL

STAGE 1

North West Regional Spinal Injuries Centre
Southport & Ormskirk NHS Trust

Managing compromise to skin integrity

North West
Regional Spinal
Injuries Centre
Southport &
Ormskirk NHS
Trust

- It is essential that if a non blanching red mark appears the area is maintained pressure free even if this requires a period of bed rest.

- If there is a breach in the skin integrity it will require a suitable dressing to promote healing, cover and protect to prevent infection.

The development of PU

- Blanchable erythema is a reddened area that temporarily turns white or pale when pressure is applied with a fingertip. This is an early indication of pressure.

- Nonblanchable erythema is redness that persists when fingertip pressure is applied. It means that tissue damage has already occurred.

The development of PU

- Pressure damage - Can develop in hours – but may take up to 5 days to manifest as anything significant

- A grade 2 can be resolved but lack of a rigorous approach > progress to grade 4

SCI Pressure Ulcers

- Are all pressure ulcers avoidable ? > clinical indicator
- UK: 1,760 -£2,620 million is spent each year treating Pressure Ulcers
- In the early days of post SCI care, incidence of pressure ulcers were high and were often the cause premature death

SCI Pressure Ulcers

- 8% risk of dying as a direct consequence of a pressure ulcer (Byrne and Salzberg (1996)
- 80% of people with a SCI will develop at least one pressure ulcer in their lifetime (Byrne and Salzberg 1996)
- PU Re-occurrence 35% – 39%
- Those who smoke and/or have diabetes or cardiovascular disease had higher recurrence rates.

Tissue Viability

- If any splints, plaster cases or orthoses are to be used, observe the relevant pressure areas for signs of tissue damage at least 3 times a day.
- Obtain advice from the orthotist, OT or physiotherapist regarding appropriate care and application.
- Liaise with the orthopaedic services with regard to plaster casts.
- If pressure area damage is noted, contact the Tissue Viability Nurse immediately.
- Document the damage in the case notes, all tissue damage should be measured and be photographed, initially and then weekly thereafter.
- Act immediately to relieve the pressure on the damaged area.

Tissue Viability

- All staff must be made aware of the specific tissue viability care requirements of the spinal cord injured patient.
- Collars need to be removed on a daily basis to check skin underneath and to check the occiput.
- If the patient is turned high enough there should not be a problem with pressure sores developing.

Don’t let this

Turn into this!

Spinal Clearance & Acute Management

Moving and Handling: Risks

- Further neurological injury
- Developing pressure ulcers
- Additional problems
- Consequences:
- Liability:

Moving and Handling

- Prevention is better than cure.

Moving and Handling

Prevention and Risk Assessment

- All patients must be assessed for pressure area protection
- Dynamic/Airflow mattresses are **not to** be used
- Do not use automatic turning mode

Moving and Handling

- All spinal cord injured patients are nursed naked in bed or with a gown laid on top
- All patients will have a regime of 2-3 hourly spinal log roll turns
- Patients should be left in the turned position on their side for a maximum of 3 hours
- Side tilt sufficiently to transfer sacral pressure and to assist with chest drainage.

Moving and Handling

- Liaise with the physiotherapist and refer to the manual handling guidelines. If the regime is problematic, contact the centre the patient has been referred to for advice.

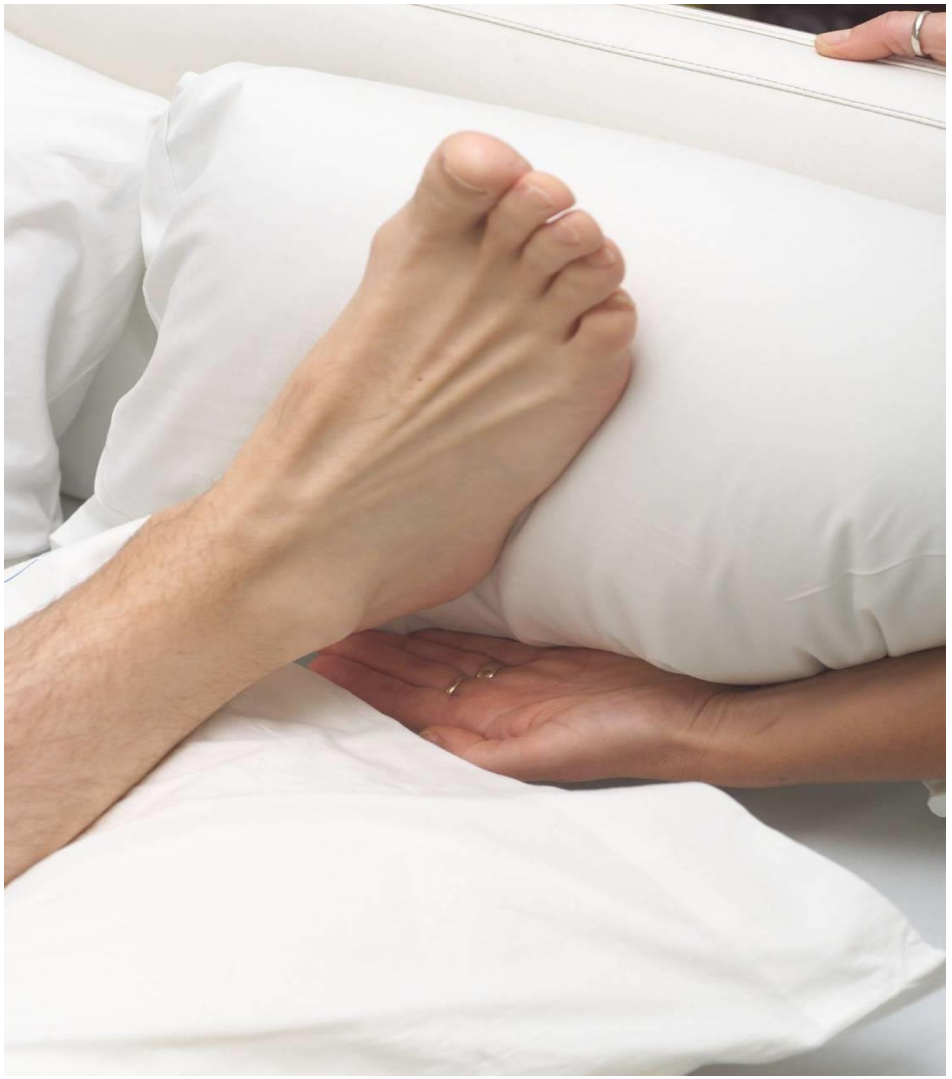
- For ventilated patients, maintain **maximum** of 15º reverse Trendelenburg.

Moving and Handling

- Unless contraindicated by other injuries, provide at least daily range of passive exercises of hands and feet.
- This will work to prevent foot drop and upper limb and finger contractures.
- *This should commence within the first 24hrs post injury.*

Moving and Handling

- Block the feet to a 90˚ resting position, using pillows. Do not force the feet into position.



Moving and Handling

- Position the hands on small pillows. For tetraplegic patients shoulders should be abducted and alternate arms raised at each turn

Transferring the SCI Patient

- Adhere to guidelines for the Transfer of the Critically Ill Adult.
- Ensure that the Referral Checklist and Network Transfer Form have been completed
- Ensure the provision of appropriate transfer equipment following above guidelines.

Transferring the SCI Patient

- Ensure the provision of safe packaging for the patient. The patient must be aligned, secured and protected.

- The preference is to use a vacuum mattress. If the spinal board is to be used, ensure that pressure area protection is provided in the form of a specialised pressure blanket, or as stated preferably a vacuum mattress.

Transferring the SCI Patient

- There is a high risk of damage to pressure areas for any patient who is on a spinal board for 2 hours. (*Patient is to be placed onto the spinal board on arrival of the ambulance crew and not before).*

- Liaise with the Spinal Cord Injury Centre prior to dispatch.

MASCIP guidelines

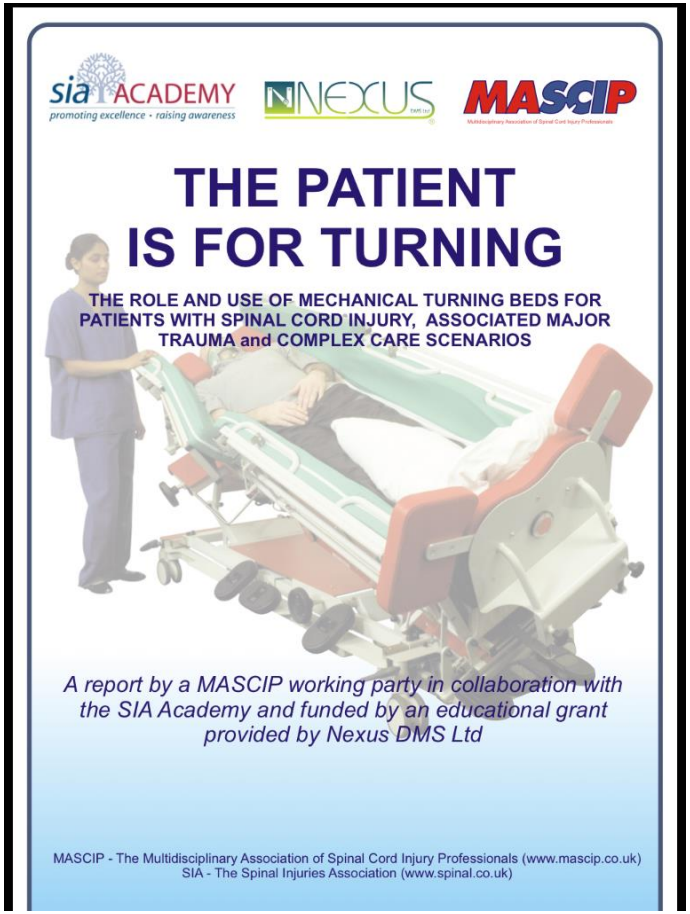
- Team work and Co-ordination – by a nominated team leader, with experienced staff
- The patient's contribution- co-operation & communication
- Role & Responsibility of The team leader –
- Communicating and controlling the turn
- checking and monitoring alignment throughout
- checking and recording the patient's sensory and motor function in all four limbs at the beginning and end of a manoeuvre.

Key Points

- Prevention – better than cure & reduces reoccurrence rate
- Adherence to PU prevention policies/guidelines – particularly NICE/RCN (2001)
- Risk assessment tools - does not replace clinical decision making
- Turning: as MASCIP guidelines
- Checking skin: blanch test & reporting and taking action
- Record keeping

Resources : available from MASCIP website

- The Patient is for Turning (2013) Report. MASCIP
- Moving and Handling patients with actual or suspected SCI (2009) (MASCIP/SIA)



MOVING AND HANDLING PATIENTS WITH ACTUAL OR SUSPECTED SPINAL CORD INJURIES (SCI)

Produced by the Spinal Cord Injury Centres
of the United Kingdom and Ireland

Initiated by
Multidisciplinary Association of
Spinal Cord Injury Professionals

Supported by an education grant from Huntleigh Healthcare

Endorsed by

sia ACADEMY
promoting excellence • raising awareness

MASCIP

HUNTLEIGH

Southport and Ormskirk Hospital NHS
NHS Trust

irwinmitchell solicitors

North West Regional Spinal Injuries Unit Education Day, Southport

17th March 2015

An Overview of Spinal Cord Injury and the services offered by the Spinal Injuries Association

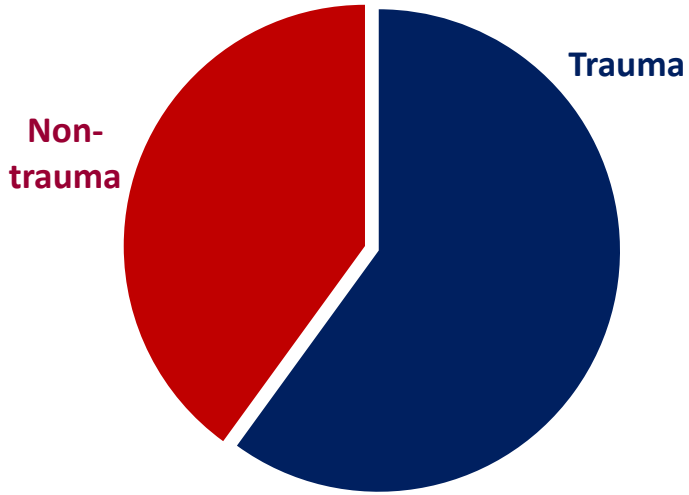
Rebuilding lives after spinal cord injury

SCI: Facts and Figures

How many people are affected by SCI

every 8 hours

40,000 living with SCI in UK

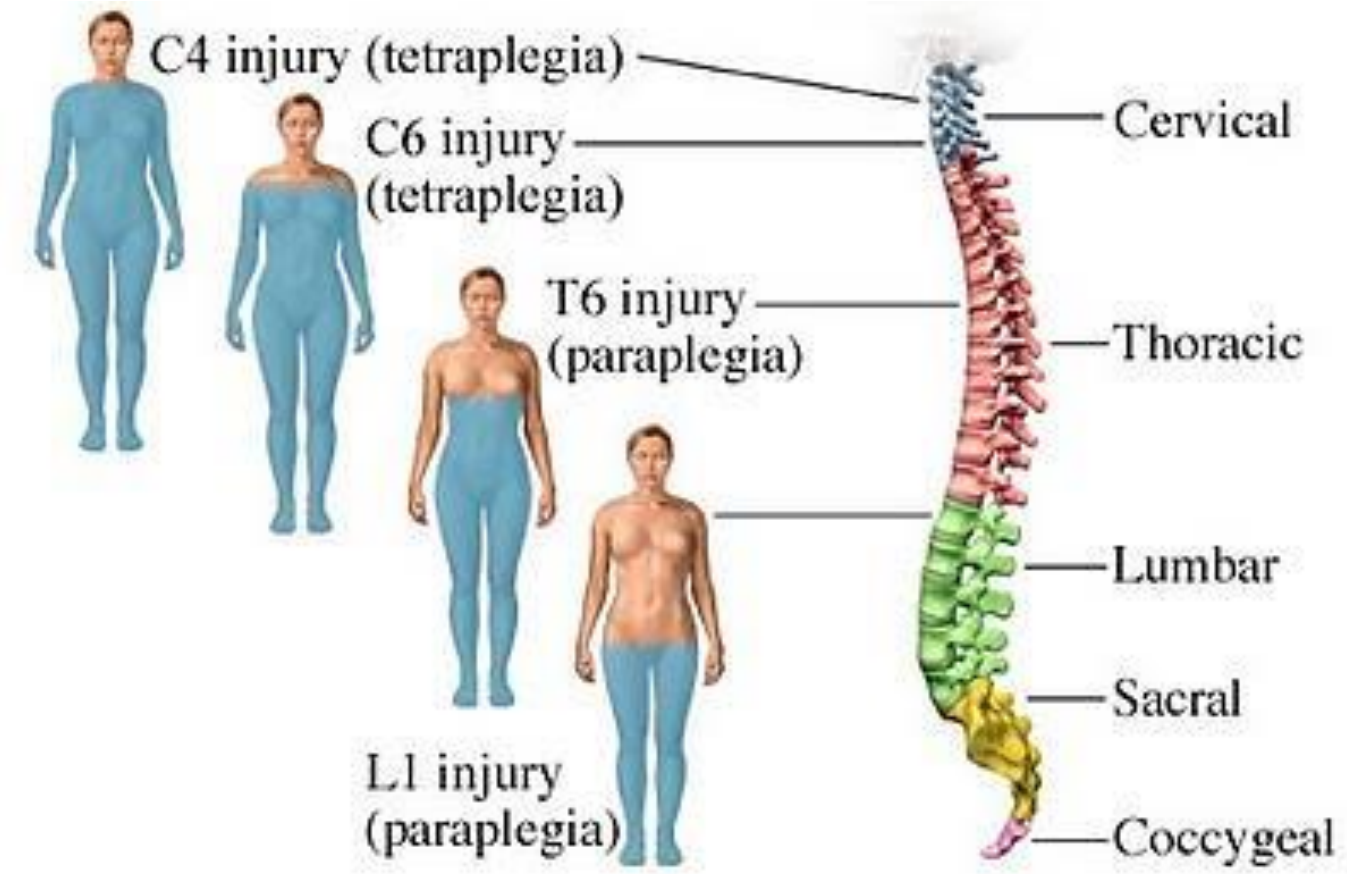


What causes SCI?

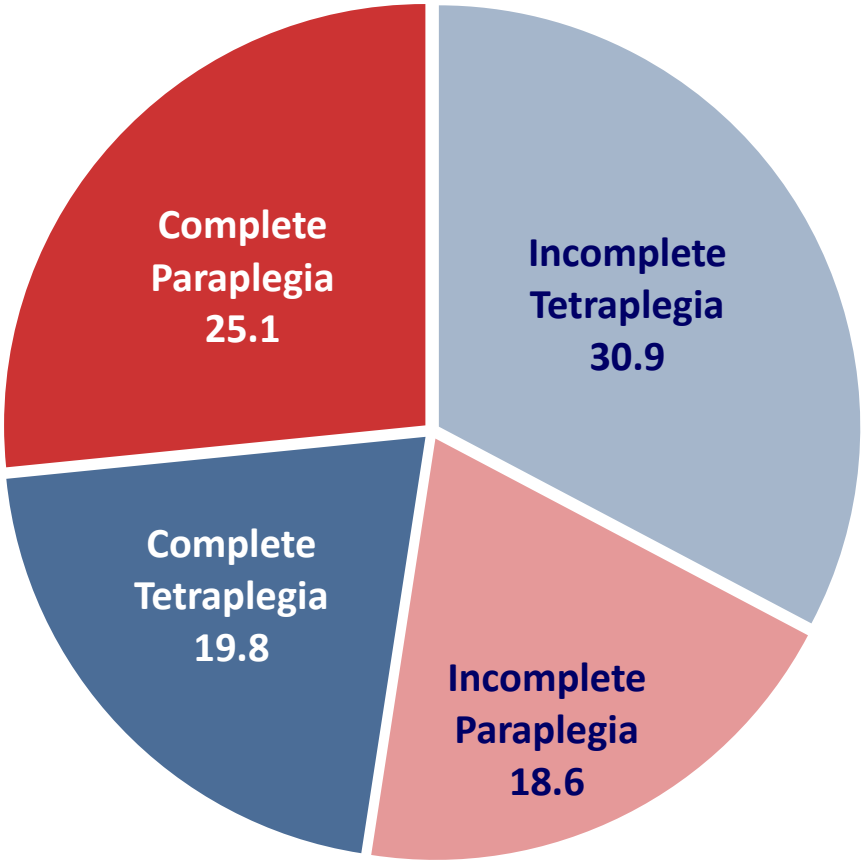
Traumatic injury
(falls, RTA, sporting injuries)

Non-traumatic injury
(illness or disease)

Paraplegia and Tetraplegia



Complete or Incomplete

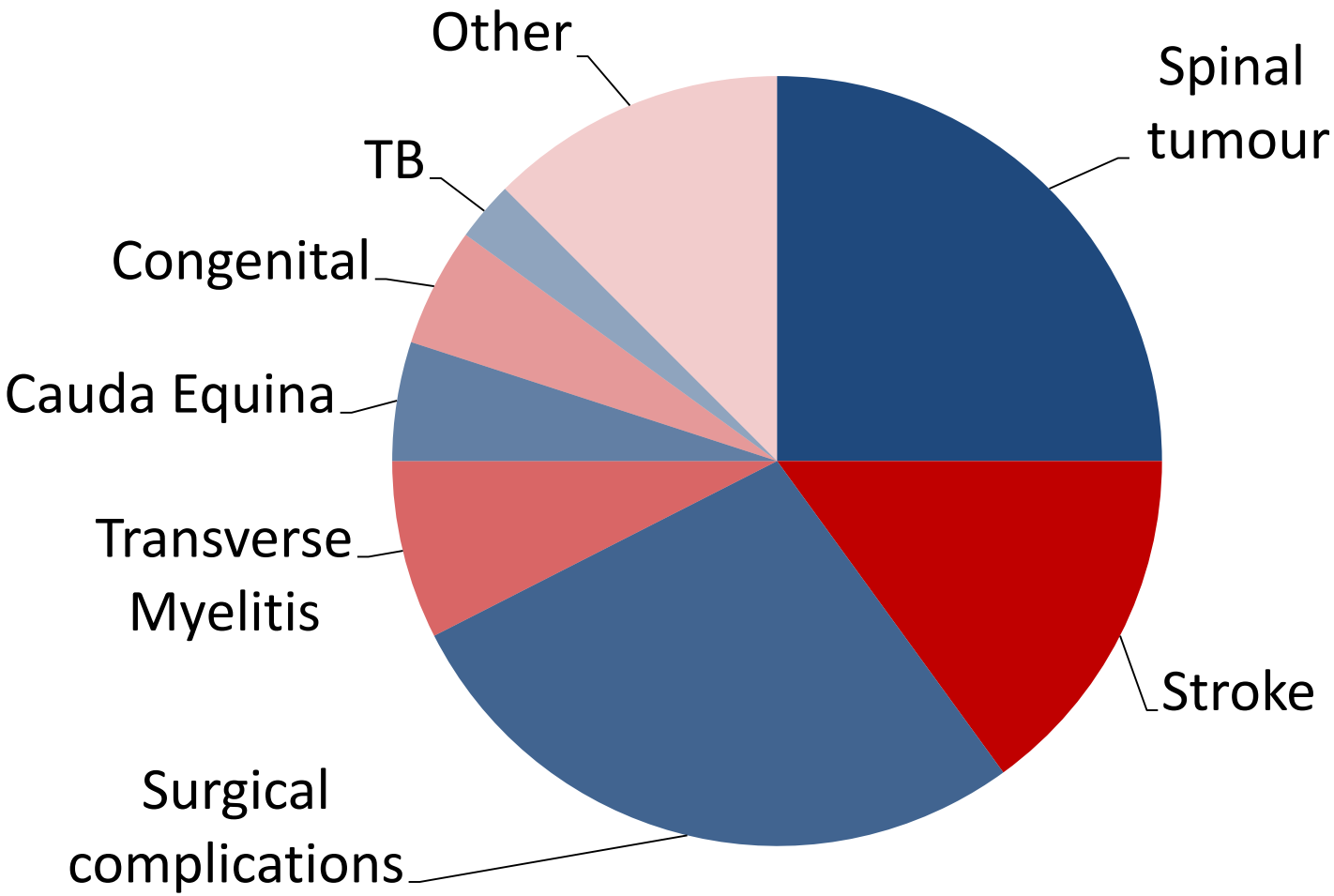


Source: 2011 NSCISC Annual Statistical Report. Injury type at time of discharge (%)

Complete SCI
full paralysis below the lesion

Incomplete SCI
only part of the spinal cord is damaged leaving some degree of motor and sensory function below the incomplete lesion

Non-traumatic injury



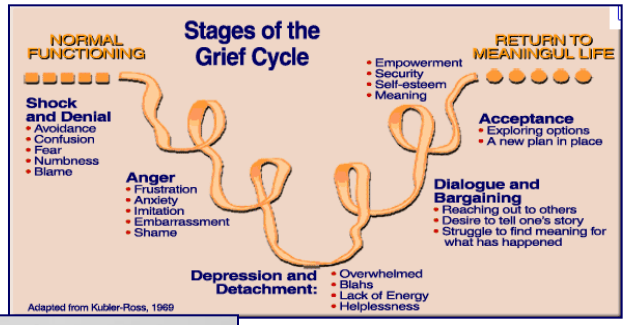
SCI - the early days
…healthcare issues

sia
spinal injuries association

SCI - the early days
…social issues

SCI - the early days
…psychological issues

- Grieving process
- Family / partnership breakdown
- Social isolation
- Body image
- Financial worries
- Depression



Why Me?

- We all try to find the answer to this question.

You always say what IF

- Yet here we are in a hospital not knowing what will happen to us.

Who can help us & Why

Along with NHS HCP

SIA Peer Support Officer

The need to talk to some who has been there and who can also support the families

Explain to them what may be happening to them and where they may be going, and the benefits of a SCIC

There is life after a SCI

Spinal Injuries Association

Baroness Masham of Ilton
Founder and Life President

User-led organisation established in 1974 to support people affected by spinal cord injury

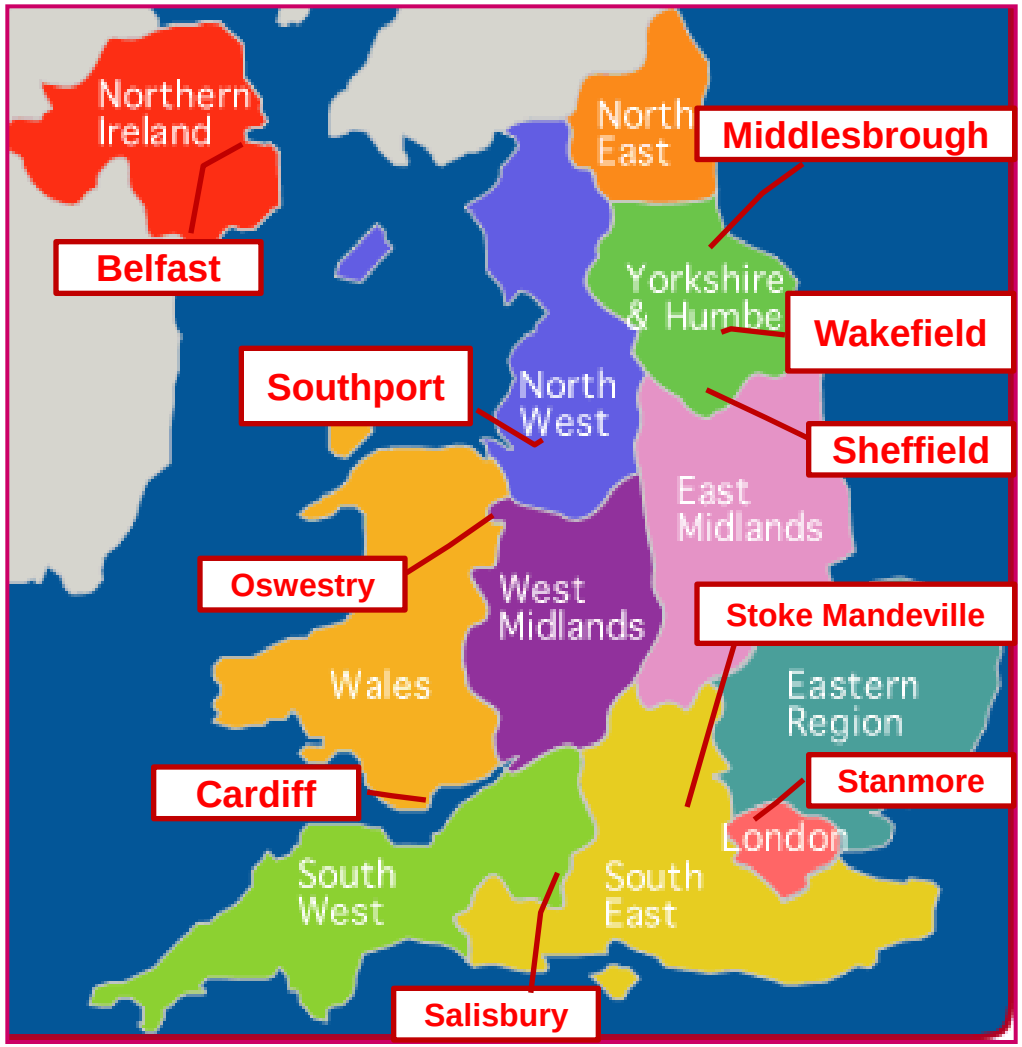
Our mission is to support people affected by spinal cord injury and to advise, educate and campaign on all its aspects

We aim to

- **Support all those affected by spinal cord injury**
- **Provide services and publications to enable and encourage paralysed people to lead independent lives**
- **Campaign for improved medical and social care for spinal cord injury**
- **Work to create an understanding of the causes and consequences of injuries**

SIA's Services

SIA's Outreach Services Team



- 10 SCIC Peer Support Officers (PSOs)
- 10 Regional PSOs
- Armed Forces PSO
- Vocational Support Manager

The Need for Regional Peer Support

- **SIA research study: Preserving and Developing the National Spinal Cord Injury Service, May 2009**
- **10% of referrals never come under the care of a SCIC**
- **41% of referrals wait over one month for admission to SCIC**
- **Significant number of new injuries, in particular non-trauma, are never referred to SCIC**

The Need for Regional Peer Support

- Increased call on SIA services from staff in non-spinal specialist settings
- Increased calls from patients and families in these settings requiring support
- Specialist peer support for Armed Forces SCI people

Who benefits?

Newly injured people in DGHs awaiting transfer to SCICs and those not admitted to SCICs

introduced by PSOs to support available from the SIA to rebuild lives after SCI

Spinal cord injured people after discharge from SCICs or Rehab Units

helped to prepare for an independent home life

Who benefits?

Families of newly injured people

PSOs help family members to understand the implications of life with injury

Who benefits?

Healthcare professionals working in DGHs, Neuro Rehab Centres or Community Health settings

receive training and support from someone living with spinal cord injury

supported patients tend to engage more positively in their treatment and rehabilitation

What do we offer
to people affected by SCI?

- Give information and advice over a wide range of topics related to living with spinal cord injury
- Share personal experiences of SCI with newly injured people and their families
- Offer on-going support in getting back to everyday living

What do we offer
to health professionals?

- Support SCI patients under their care
- Deliver a range of CPD accredited spinal cord injury presentations
- Feedback issues from health professionals to SIA

Challenges for peer support

- **Identification of new injuries**
- **Developing a formal referral system – link with creation of pathways**
- **Timing of first visit**
- **Building better links with non-specialist rehabilitation centres**

“Some people are just not ready to accept that they are ‘disabled’ and don’t want to be involved with that.”
(University of Plymouth, March 2011)

Referrals for peer support

- Peer support is an elective service
- PSOs rely on Health Professionals to raise awareness of SIA's Peer Support service among SCI patients and their relatives
- SCI patients tend not to refer themselves
- Please contact your PSO if there is someone who would like support

Training opportunities
SIA Study Days

Bladder & Bowel Management

Moving and Handling

Managing Spinal Cord Injury

FREE for NHS Health Professionals

visit www.spinal.co.uk for details

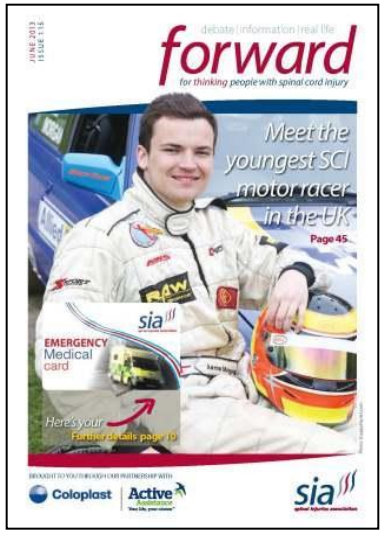
In-Service Training

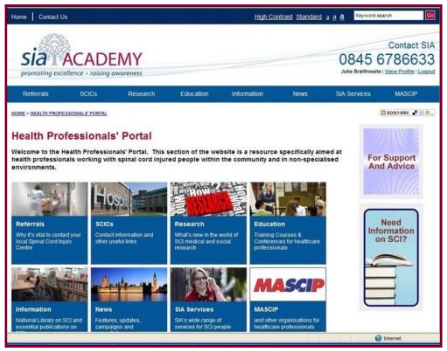
Spinal cord injury ……The early days

Spinal cord injury ……The long term impact

Management of the older person with spinal cord injury

Associate membership





Free SIA membership

***forward* magazine**

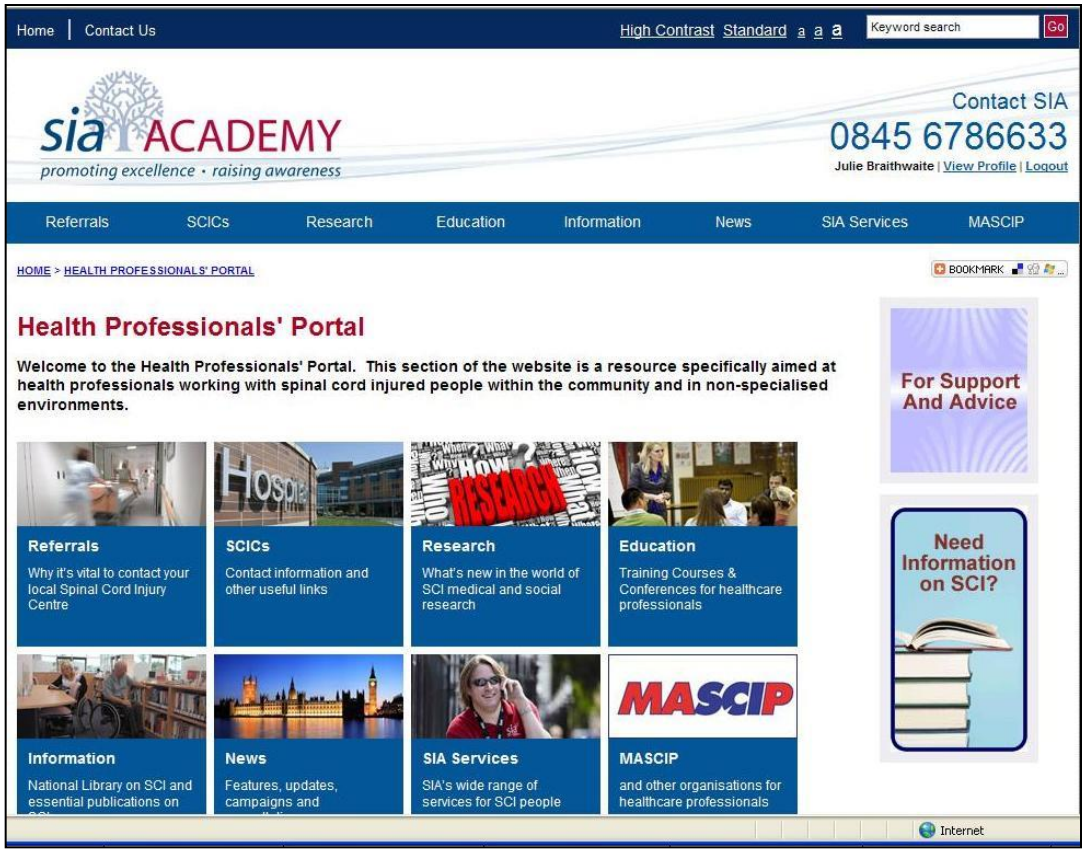
e-clips

Website – access all areas

Health Professionals Portal

Join online at www.spinal.co.uk

Health Professionals' Portal



www.spinal.co.uk

'One stop shop' for information and resources for healthcare professionals outside of SCICs

Links to help you refer a SCI patient to your local SCIC

References and resources

MASCIP website - www.mascip.co.uk

MASCIP, Moving and Handling Guidelines (2009),

MASCIP, Bowel management Guidelines (2009)

MASCIP, SCI in older people (2010)

SIA's Gaining the Ground DVD

SIA factsheets/publications
e.g. Community Care book and
Moving Forward (reference list available)

SCIC Outreach support (list available)

sia
spinal injuries association

Contact us

Advice line: 0800 980 0501

Email: sia@spinal.co.uk

Website: www.spinal.co.uk

FREE MEMBERSHIP

@SpinalInjuries

Spinal Injuries Association

Southport and Ormskirk Hospital NHS
NHS Trust

irwinmitchell solicitors

North West Regional Spinal Injuries Unit Education Day, Southport

17th March 2015