

SPINAL CORD INJURIES LONG TERM SEQUELAE

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A bit of history

- Edwin Smith's surgical papyrus 1862
 - 'an ailment which cannot be treated'*
 - each case was classified by 3 different verdicts
 1. Favorable
 2. Uncertain
 3. Unfavorable
- WW2 Brigadier Riddick
 - 'a second front'*
- Sir Ludwig 'Poppa' Guttman 1944
 - 'the only way you get out of here is on a stretcher or six feet under'*
- Stoke Mandeville, others followed
- Skin, bladder, bowel

Getting better all the time

- Paramedics
- ITU
- Specialist rehab
- Care package
- Lifelong follow-up
- 'Injury to grave'
- Life expectation

SCI rehab, JCUH

The team

- Medical
- Nursing
- Therapist
- Specialist nurses
- Psychologist
- Social worker
- Urologist
- GI surgeon
- Plastic surgeon
- Hand/shoulder surgeon
- Intensivist / home ventilation
- IT

How does the patient feel?

- Anger
- Frustration
- Resentment
- Fear
- Helplessness
- Uselessness
- Loss of self esteem
- Social stigma
- 'Want to die'

What is wrong?

- Skin
- Bladder
- Bowel
- CVS
- Respiratory
- Bones
- Sexuality
- *Everything!*

Pressure sores: National Pressure Ulcer Advisory Panel

NPUAP

‘ an area of unrelieved pressure over a defined area usually overlying a bony prominence resulting in ischemia, cell death and tissue necrosis’

P ulcers do not progress from grade 1 to grade 4

Data from Model systems : 50% - 80% develop p
ulceration

Actual costs:

\$ 20,000 – 30,000 for less severe ulcers

\$ 70,000 to heal complex full thickness ulcers

Pressure sores

Primary factors – pressure, shear, moisture, anaemia, nutritional deficiency & insensate skin

- Areas of pressure concentration
- SCI – unique changes
 - Skin collagen/ Lysyl hydroxylase
 - Density of adrenergic neurones
 - Slow re-flow rate and vascular response

Follow -up

- Global review
- Short notice
- Debridement
- Pressures sore clinic
- Pressure sore pathway
- Prevalence 16%
- Readmission rate 14.5% - 2.5%
- LOS 64.5 days – 40.5 days
- Snapshot 2012-2013 : LOS 37days
- Never a dull moment !

Neurogenic bladder

- Supra-sacral
 - DSD 'intermittent or complete failure of relaxation of the external urethral sphincter during detrusor contraction
- Sacral
 - Acontractile bladder
 - Detrusor/pelvic nerve vs. external sphincter/pudendal nerve
- Cauda equina lesions
 - Pavlakis et al: trauma was responsible for conus and cauda equina lesions in >50% cases – the incidence of lumbar disc prolapse causing cauda equina syndrome is 1-15%.

Problems / follow-up

- Urinary tract infections
- Renal and kidney stones
- Detrusor-sphincter dyssynergia
- Vesico-ureteric reflux
- Hydronephrosis
- Renal failure
- Urethral & suprapubic catheters : metaplasia / SCC

- Annual USS, specialist clinic, prophylaxis
- Sphincterotomy, diversions, cystoplasty, bladder neck closure etc

basically to convert to a safe method of management

Gastrointestinal changes

Gastric motility / pacemaker potentials / emptying

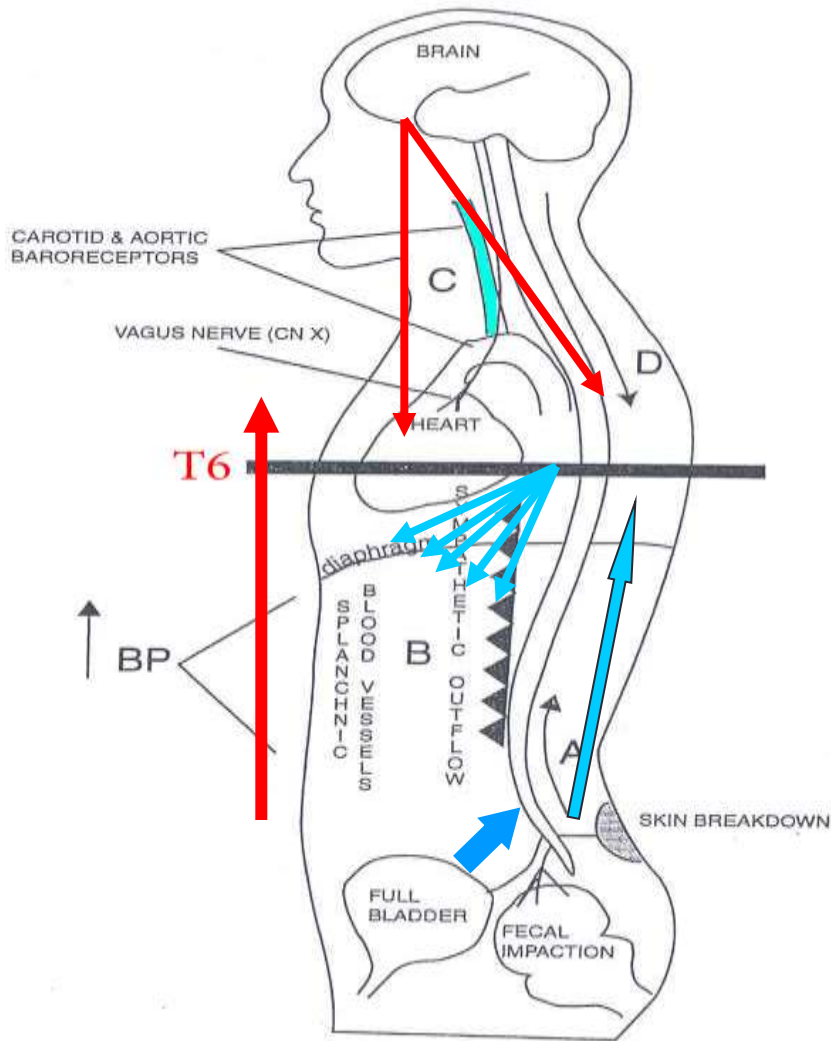
Dissociation of antral and duodenal motility

- Gastro-colic reflex
- Colon innervation: extrinsic
 - intrinsic: Auerbachs & Meisners
- Haustrations and mass movements: sluggish, get worse with time
- Megacolon
- ‘ ..beating a tired horse’
- Fecal incontinence
- haemorrhoids / mucosal prolapse

Cardiovascular

- Overriding vagal influence
- Loss of sympathetic tone
- Bradycardia and hypotension – ‘cardinal signs’
- Orthostatic hypotension
- Gets better with time
 - Vascular wall receptor hypersensitivity
 - Development of spinal postural reflexes
 - Adaptation of renin-angiotensin system

Autonomic dysreflexia



- Sensory input
- Massive reflex sympathetic discharge
- Hypertensive crisis
- Failure of protective mechanisms
- Sympathetic system prevails below level of injury
- Parasympathetic system prevails above level of injury

Temperature regulation

- Do not sweat
- Do not shiver
- 'Poikilothermic'

Respiratory

- Paralysis of intercostals
- Diaphragm ' the bellows'
- Atelectasis : alveolar surfactant, alveolar radius
..significantly large pressure required to open a given alveolus

Vital capacity drops

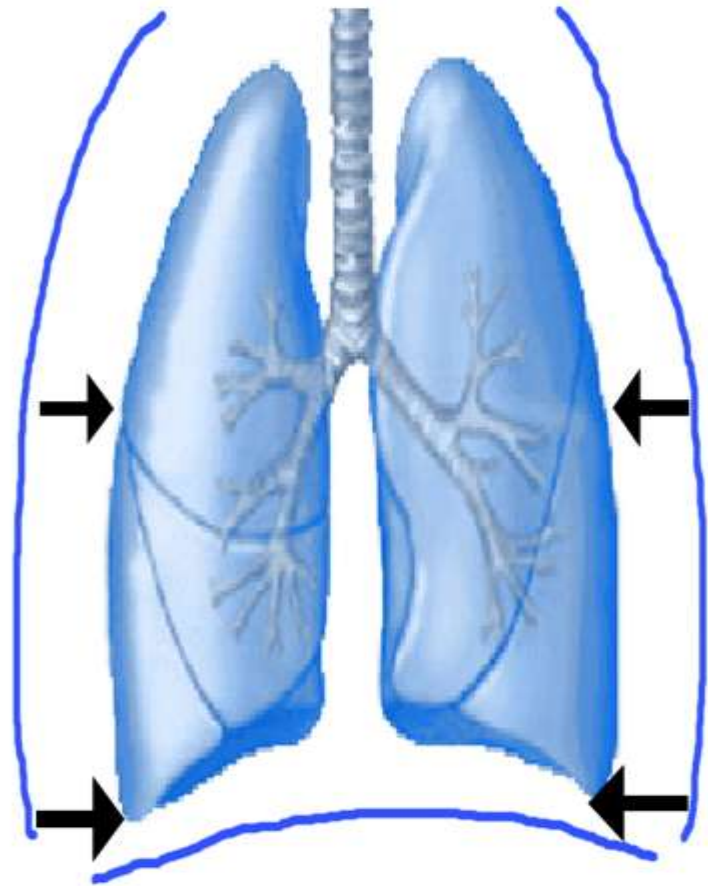
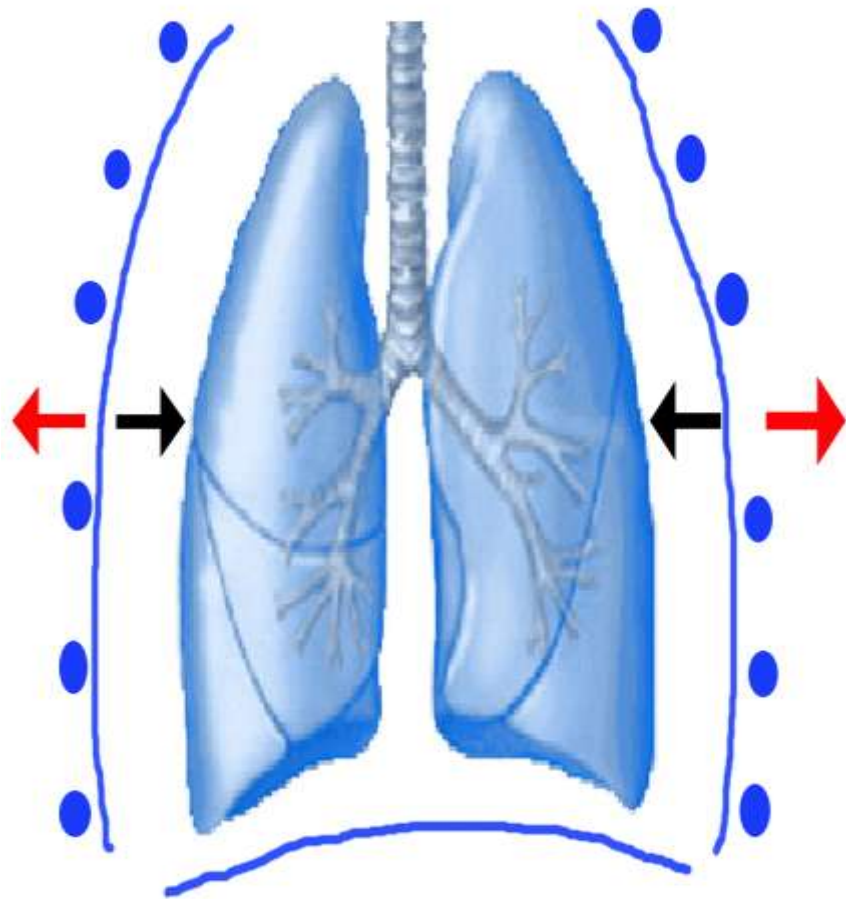
Obstructive sleep apnoea

Recurrent hospital admissions, tracheostomy, mechanical ventilation, weaning

Care package / cough assist / NIPPY / mechanical ventilation

Respiratory clinic : various measurements

Respiratory Instability



Musculoskeletal

- 10 days: Leach calcium from bone
- Hypercalcaemia
- Hypercalciuria
- Kidney stones/bladder stones
- Adolescence
- 18 months: 75% fracture threshold
- Bones remain fragile for life

Sexuality

Women : amenorrhoea / fertile

Men : erectile dysfunction (ED)

Infertile

ED clinics and fertility clinics

Back to work

- Narratives fall into 7 overlapping themes
 - 1 Salary and what it can support
 - 2 Health insurance and fringe benefits
 - 3 Promotion and recognition
 - 4 Job Satisfaction
 - 5 Social connection and support
 - 6 Making a difference and helping others
 - 7 Psychological and emotional leads

Different groups appears to focus on different types of things

Blue collar vs white collar

Return to work provides: money to support a certain life style (having a family, home, car)

Gives a sense of identify, social connections and a reason to get up in the morning

...I'm worth it
Life has just begun

Never say die!!