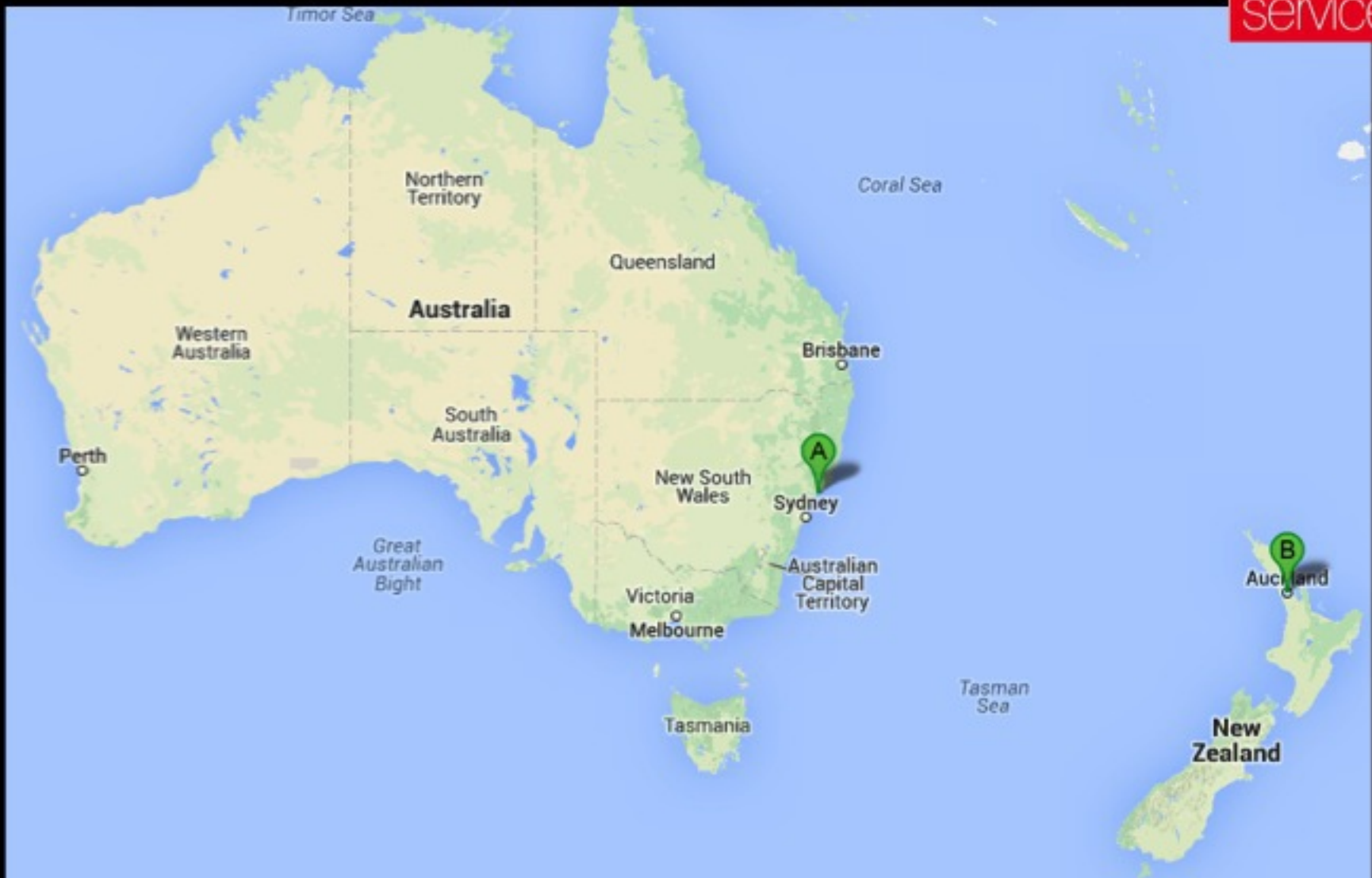


BIG TRAUMA BIG TROUBLE

**INJURY Conference
31st July 2014
Kate King: Trauma CNC
John Hunter Hospital
Newcastle, Australia**

Newcastle



Our Beaches



Our surfing Trauma Surgeons



Our Hospital

JOHN HUNTER HOSPITAL

John Hunter Children's Hospital

MAIN ENTRANCE

Awabakal

Welcome

Our future

Thursday April 17, 2014

News | Local News

Aa Larger / Smaller | Night Mode

Newcastle gets Australia's biggest KFC

Dec. 21, 2010, 4:49 a.m.

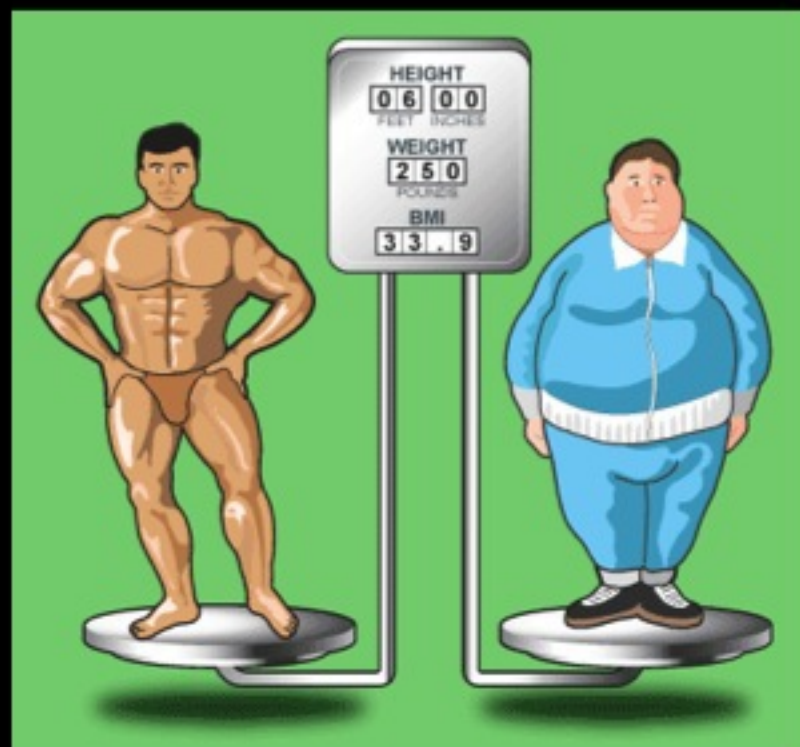


OPENED. The new Hunter Street KFC store.

Australia's 600th and largest KFC store, at the old Palais Royale site on Hunter Street, was officially opened today.

Definition

WHO DEFINITIONS		SURGICAL LITERATURE	
BMI	Classification	BMI	Classification
< 18.5	underweight	< 18.5	underweight
18.5–24.9	normal weight	18.5–24.9	normal weight
25.0–29.9	overweight	25.0–29.9	overweight
30.0–34.9	class I obesity	30.0–34.9	obesity
35.0–39.9	class II obesity	≥ 35 to 40	Severe obesity
≥ 40.0	class III obesity	40–44.9	Morbid obesity
		≥ 45 to 50	Super obesity
BMI = Body weight/square of height		Metric: BMI = kilograms / meters ²	



Calculated by weight in kg/height in M²

OMG!

Almost **1** in **3** adults in NZ
are obese and a further **34%**
are overweight



OMG!

In just 10 years time it is
predicted that **80%** of
Australia's adult population
and **33%** of our kids will
be overweight/obese

Monash Obesity and Diabetes Institute 2013



Sobering Obesity Stats

- Australia and New Zealand are some of the fattest nations in the developed world
- Prevalence has **doubled** in the past **20** years
- Obesity has overtaken smoking as the leading cause of premature death & illness in Aust.



The Cost of Obesity

In 2006 overall cost of obesity
to New Zealand health care
was

\$686 million

*Lai, A. et al. Health care and lost productivity costs of overweight & obesity
in New Zealand, ANZJPH, Dec 2012*



The Cost of Obesity

In 2008 overall cost of obesity
to Australian society & govt.
was

\$58.2 billion

Colagiuri S, Lee CMY, Colagiuri R et al. (2010) The cost of overweight and obesity in Australia. Med J Aust 192: 260–64



The cause of obesity



‘Obesogenic environment’

Profile of the Obese in Aust.

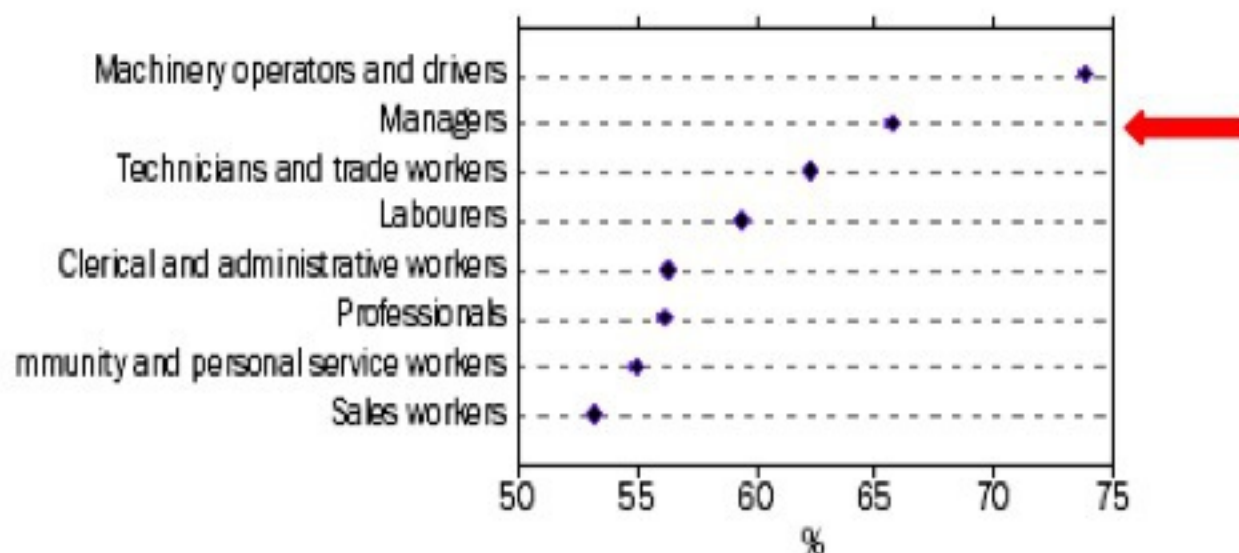
- Risk Factors:
 - Male
 - Remoteness
 - Low household income
 - Disadvantaged (low socio economic status)
 - Uneducated and

Profile of the Obese in Aust.

- Risk Factors:
 - Male
 - Remoteness
 - Low household income
 - Disadvantaged (low socio economic status)
 - Uneducated and
 - Managers

Occupation

4.6 Proportion of people overweight or obese(a)(b), by Occupation



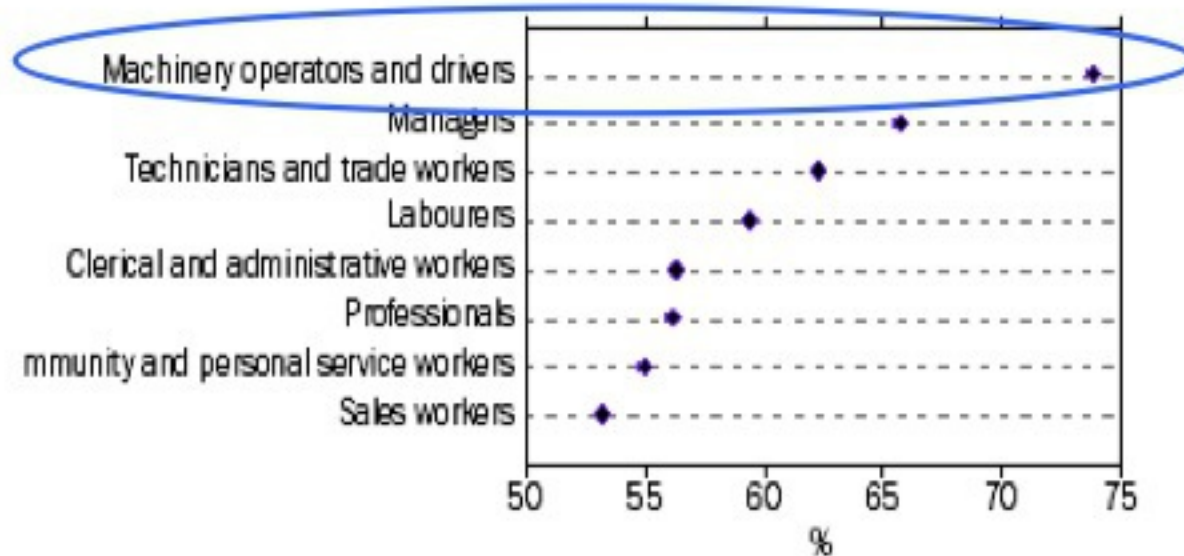
(a) Measured Body Mass Index.

(b) Excludes persons for whom measured height or weight was not available.

Source: National Health Survey 2007-08

Occupation

4.6 Proportion of people overweight or obese(a)(b), by Occupation



(a) Measured Body Mass Index.

(b) Excludes persons for whom measured height or weight was not available.

Source: National Health Survey 2007-08

Drivers

- **75%** of this profession in Australia are obese
- Obesity has a strong link to OSA
- These people are on the road daily!
- In the US truck drivers
 - BMI > 35 were **43 – 55%** more likely to involved in a crash
 - They accounted for **13%** of fatal accidents

Anderson JE et al, 2012. ***Accident, Analysis & Prevention***
Vol 49, Nov. pp. 378-384



Trauma

“Drivers in WHO obese class II & III were **51%** and **80%** more likely, respectively to have a fatal injury than normal BMI drivers”

*Rice TM and Zhu M, Driver obesity and the risk of fatal injury during traffic collisions, **BMJ**, Jan 2013*

Medical aspects of fitness to drive

A guide for medical practitioners



NZ TRANSPORT AGENCY
WAKA KOTAHĒ

New Zealand Government

10.1.1 Obstructive sleep apnoea

Obstructive sleep apnoea (OSA) syndrome is characterised by repeated apnoea (breathing pauses), habitual snoring and daytime sleepiness. Clinical evaluation helps to assess the severity of symptoms and other causes of sleepiness, particularly chronic sleep restriction (insufficient sleep). OSA is frequently associated with obesity, a thick neck and a reddened and oedematous oropharynx. As clinical criteria lack specificity, a sleep study is usually required. This allows accurate measurement of severity, identification of alternative sleep disorders and documentation of the effect of sleep stage and position.

Medical standards for individuals applying for or renewing a class 1 or class 6 licence and/or a D, F, R, T or W endorsement (see appendix 3)

When driving should cease

Driving should be restricted or cease for individuals who meet the high-risk driver profile, as follows:

- are suspected of having OSA where there is a high level of concern regarding the risk of excessive sleepiness while driving while the individual is waiting for the diagnosis to be confirmed by a sleep study
- complain of severe daytime sleepiness and have a history of sleep-related motor vehicle crashes or there is an equivalent level of concern
- have a sleep study that demonstrates severe OSA and either it is untreatable or the individual is unwilling or unable to accept treatment.

When driving may occur or resume

Individuals may resume driving or can drive if their OSA is adequately treated under specialist supervision, with satisfactory control of symptoms. The Agency may impose licence conditions for regular medical assessment. Medical follow-up may be delegated to the General Practitioner.

Medical standards for individuals applying for or renewing a class 2, 3, 4 or 5 licence and/or a P, V, I or O endorsement

Commercial drivers may spend long hours driving their vehicle, operate a heavy vehicle or carry many passengers. A crash involving such vehicles could place many people at risk. Suspected OSA should always be investigated by a sleep study. Symptoms may be underreported, given the potential implications of driving restrictions.

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ORIGINAL ARTICLE

Sleep disorders: a potential role in New Zealand motor vehicle accidents

B. YEE, A. CAMPBELL, R. BEASLEY and A. NEILL

WellSleep, Department of Medicine, Wellington School of Medicine, Wellington South, New Zealand

Abstract

Background: The potential role of sleep disorders in New Zealand motor vehicle accidents (MVA) has not been systematically studied.

Aims: To trial a recruitment method and document the frequency of sleep disorders in drivers attending an emergency department with injury following MVA.

Methods: Injured drivers admitted to Wellington Hospital Emergency Department were prospectively recruited by letter and follow-up telephone call. Data from a traffic accident, health and sleep questionnaire and polysomnography were collected and analysed using the SPSS statistical package.

Results: Of 120 eligible drivers, 40 (33%) completed the study protocol. The mean age of participants was 44 ± 17 years. Non-participants were younger (mean age 33 ± 14 years, $P < 0.01$) and more often of Asian

or Pacific Island ethnicity ($P < 0.01$). Twenty-seven (67%) felt unrefreshed on waking and 10 (25%) had an elevated Epworth Sleepiness Score ($> 10/24$). Six (15%) felt drowsy or fell asleep prior to the accident. Sleep disorders were common (40%): obstructive sleep apnoea 14 (35.9%), periodic limb movements of sleep three (7.7%), sleep restriction (< 6 h sleep on a regular basis) five (12.5%), and insomnia one (2.5%).

Conclusions: Daytime somnolence and sleep disorders were commonly found in drivers attending the Emergency Department after accidents resulting in injury. Driver fatigue and sleep disorders should be considered as a potential contributing factor in New Zealand MVAs. Recruitment of drivers following a MVA via the Emergency Department is challenging. Strategies to improve recruitment are discussed. (Intern Med J 2002; 32: 297-304)

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The Question!

How does obesity impact on trauma patients and the care they receive?

Scene

M: ‡ high speed MVA 'lost control', roll over.
Ejected 20m from car, *wearing faulty seat belt*

I: C/O neck pain, L leg pain ?3L haematoma ?#, L hip
pain and L arm pain

S: BP 80, PR 120, RR 20, SaO₂ 99%, GCS 15 **140kg**

T: Pelvic Binder, Ketamine 70mgs, 1L CSL, IO
2xRBC, O₂, 20mgs Morph, 10mg Max, 4mg
Ondansetron

Scene time 1hr







Impact: Car Safety



Know these people?



Hybrid III Family

- Mr Hybrid III is 5'9" & weighs 77kg
- Most widely used test crash dummy in the world for the evaluation of automotive safety restraint systems
- Mrs H is 5' (152cm) & 50kg
- Big Brother is 6'2" and 100kg
- Not 'allowed' to drive unless in the military



Ergonomics

- Luxury cars are developing cars for a “bigger” market
 - Cars have already increased in width by 50cm’s
 - Seats are wider & deeper
 - Steering wheels lift when ignition is off
 - Buttons instead of knobs for ‘sausage fingers’
 - Strengthen grab handles
 - Reversing cameras



Impact: Injury Pattern

- Less head injuries
- More chest injuries
 - Rib fractures
 - Pulmonary contusions
- Less abdominal injuries
 - Cushion Effect
- More pelvic and lower extremity injuries
- Higher mortality rates

Scene

- M:** ‡ MBA rider '*lost control*' helmet dislodged on impact. High speed
- I:** LOC, blood L ear, L chest pain
- S:** HR 88, BP 120/65, RR 22, GCS 15, weight approx **130kg**
- T:** No IVC , Morph/Max IMI, helicopter requested

Time of injury 1326hrs

At first hospital

- Attempts at IVC insertion unsuccessful
- No bariatric EZIO needles
- CXR attended
- AMRS arrives @ 2hrs
- Discover she is bariatric
- Call for bariatric helicopter from Sydney



Impact: on time

AMRS

- 13.30** Accident
- 14.30** First Contact with AMRS
- 15.30** At patient
- 19.15** Depart First hospital
- 20.15** Arrive MTS

Impact: Transport

- Delay in scene and transport times
- Standard stretcher <150kg
- Standard helo <135kg (+bridge)
- Air ambulance width issue
- Bariatric transport based in Sydney

Stretcher Dimensions for Bariatric

Length from tip to top

Standing – 2000mm

Standing – reduced length 1850mm

Weight - 128Kg

Width - 720mm

Height

Fully standing

(ground to top of mattress) 1140mm

Fully Standing with patient

(generous measurement) 1620mm

Half Height

(ground to top of mattress) 380mm

Safe Working Load 500Kg

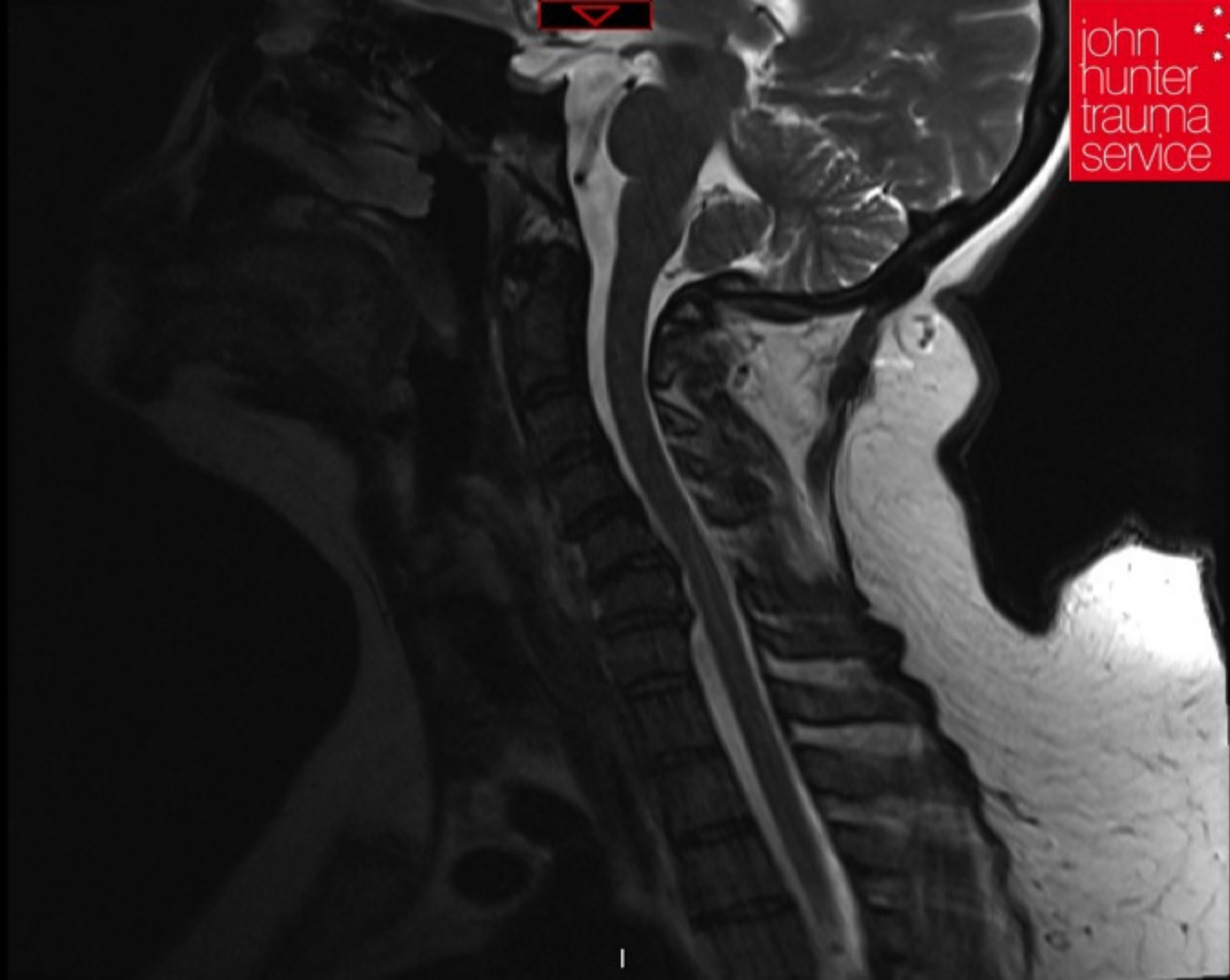


Impact: Primary Survey

Airway & C Spine stabilisation:

- Anatomy can be distorted
- Compromised by laying flat
- Cannot tolerate hard collars





Impact: Primary Survey

- **Breathing and Ventilation:**

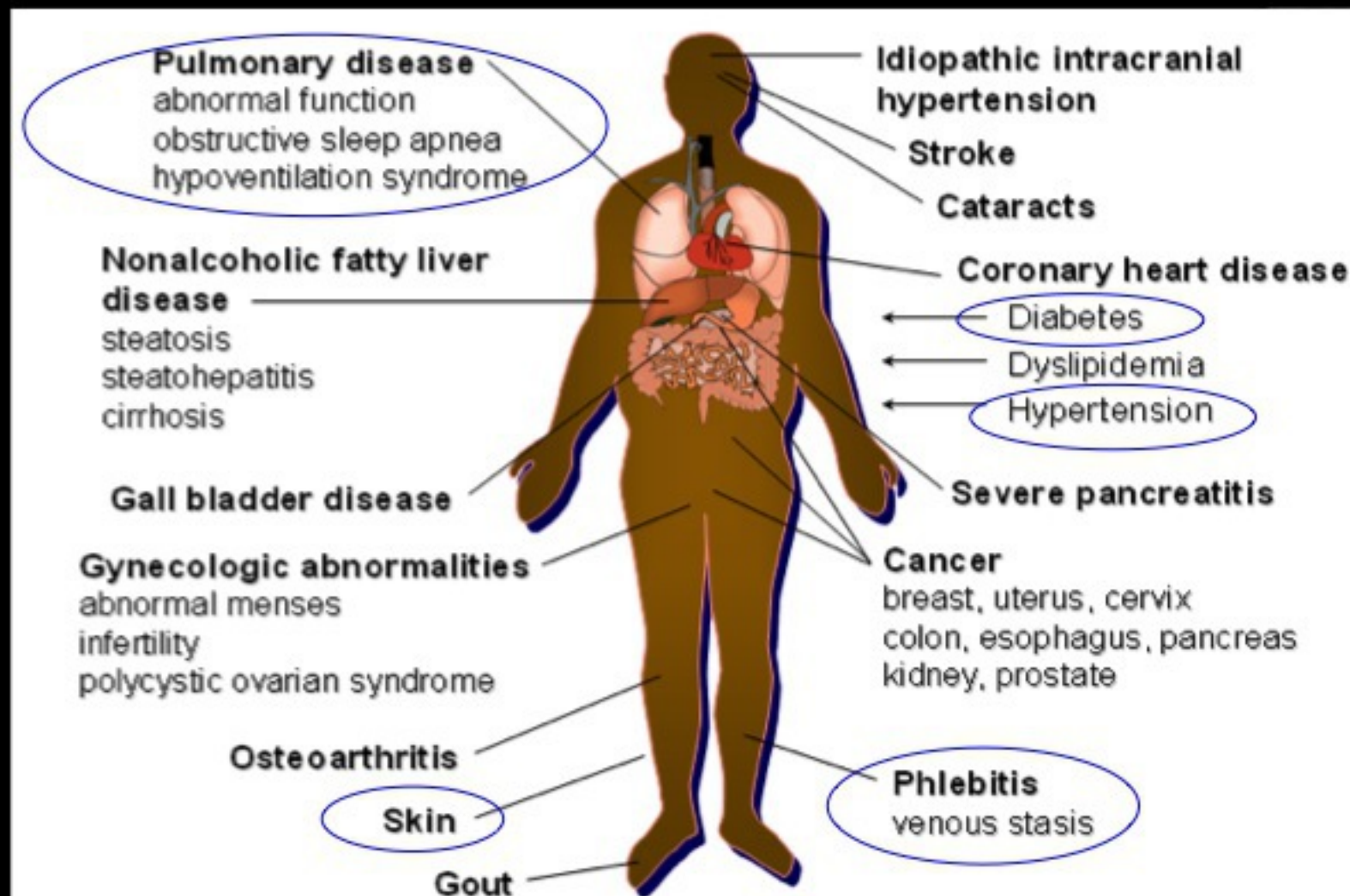
- Underlying co-morbidities e.g. OSA, obesity hypoventilation syndrome, etc
- Altered mechanics
 - ↓ functional residual capacity
 - ↓ lung volume
 - ↓ tidal volumes
 - ↓ chest wall compliance → rapid, shallow breathing
- * remember ↑ risk of chest wall injuries

Impact: Primary Survey

Circulation and Haemorrhage control:

- Greater perfusion needs
- Interwoven with co morbidities
- IV access very difficult
- Fluid resuscitation - limit
- Early use of I/O
- PICC line for medium term use
 - Increased risk of infection

Co-Morbidities



Mental Health

- Depression
- Impaired body image
- Low self esteem
- Both these patients had depression and anxiety and both were on Lexapro - sleepiness



R1

MVA rollover

Impact: Imaging

Adjuncts to the Primary Survey:

- X-Ray requires larger radiation dose and increased likelihood of motion artefact because of longer exposure time
- Ultrasound quality is decreased as the sound waves are dampened by the subcutaneous fat

MOBILE

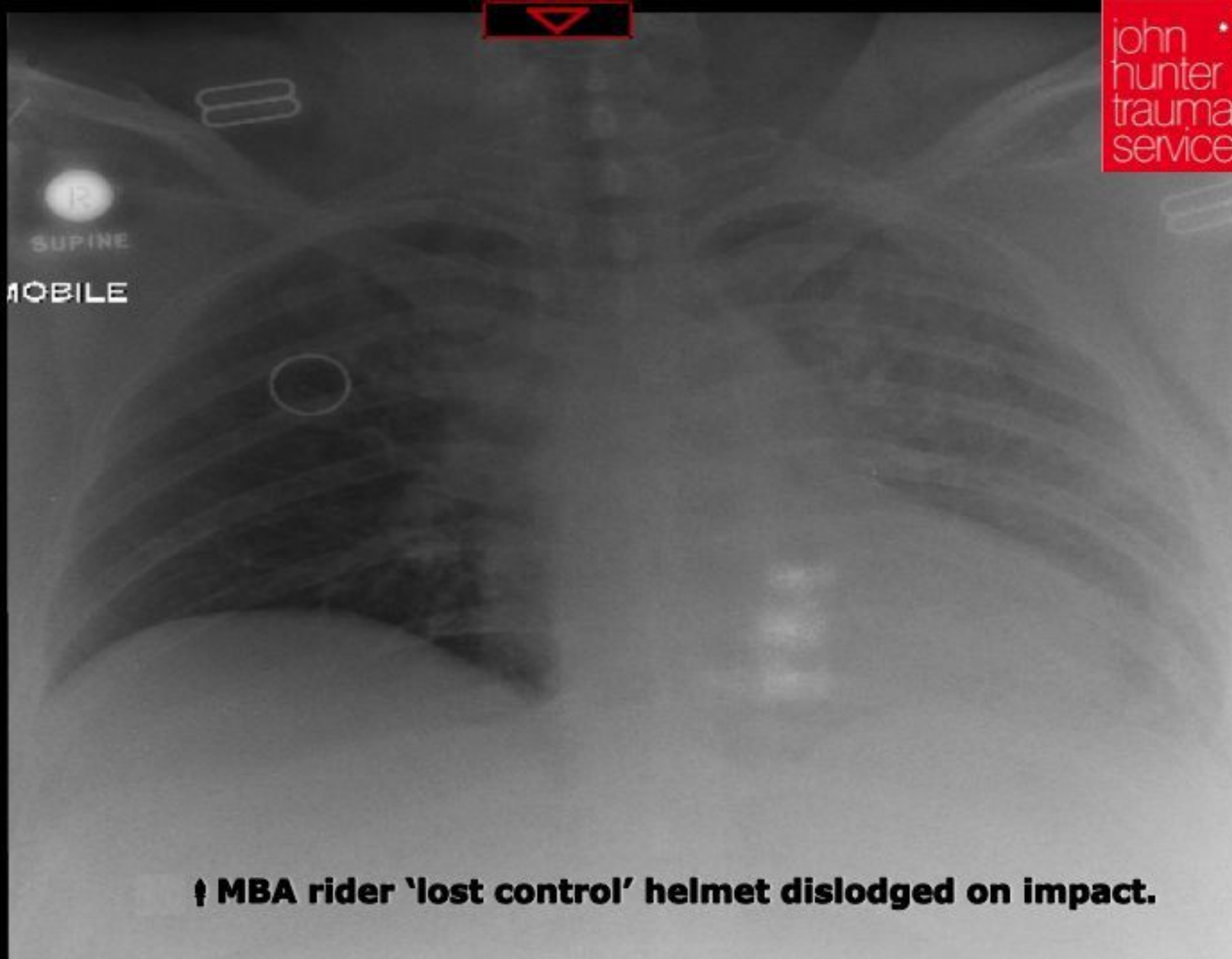
john
hunter
trauma
service

MVA rollover

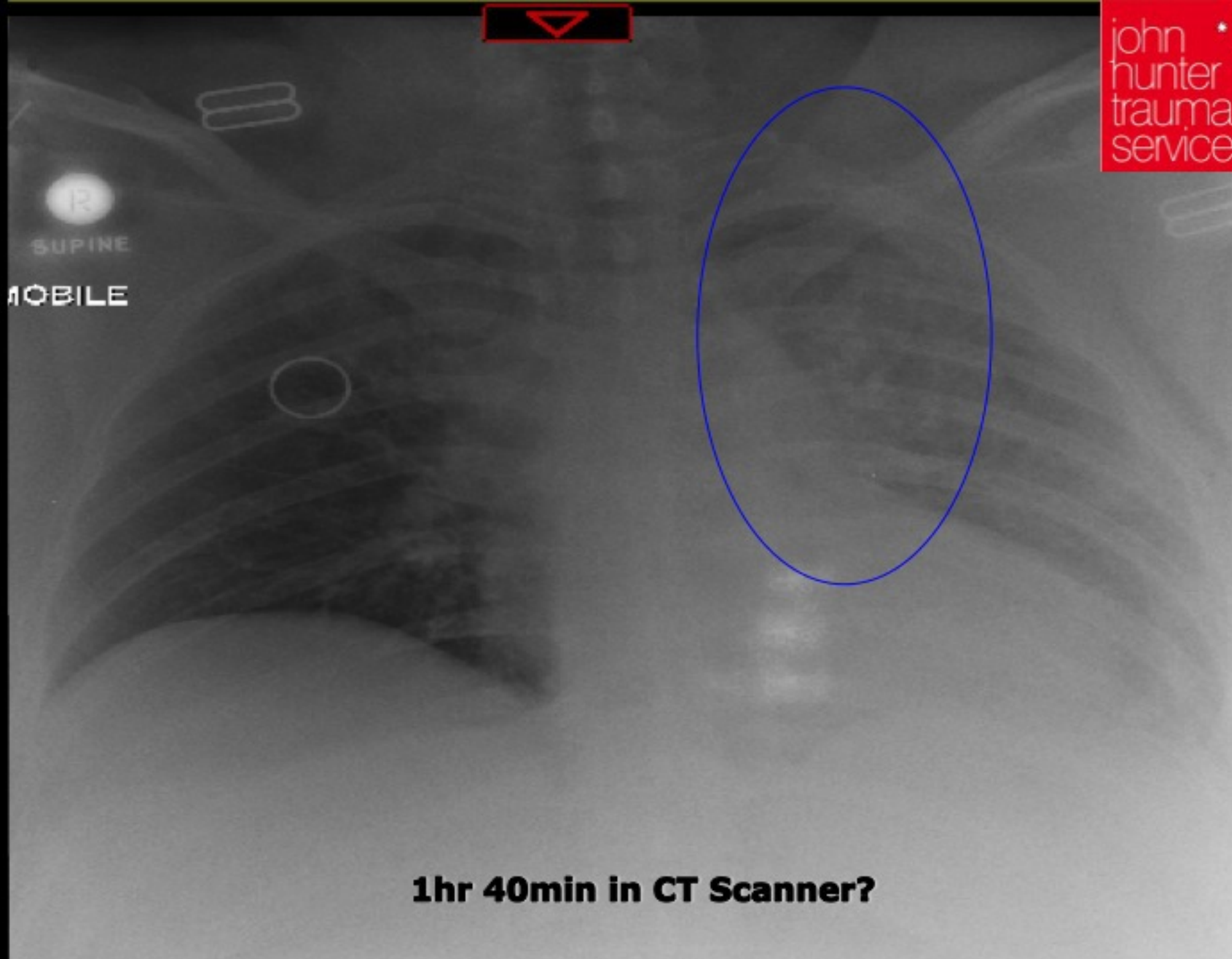
MOBILE



MVA rollover

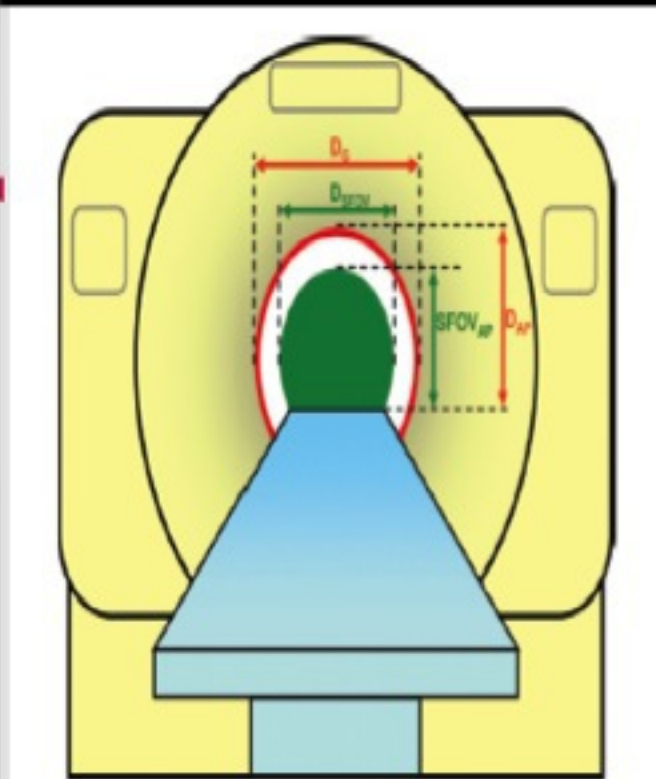
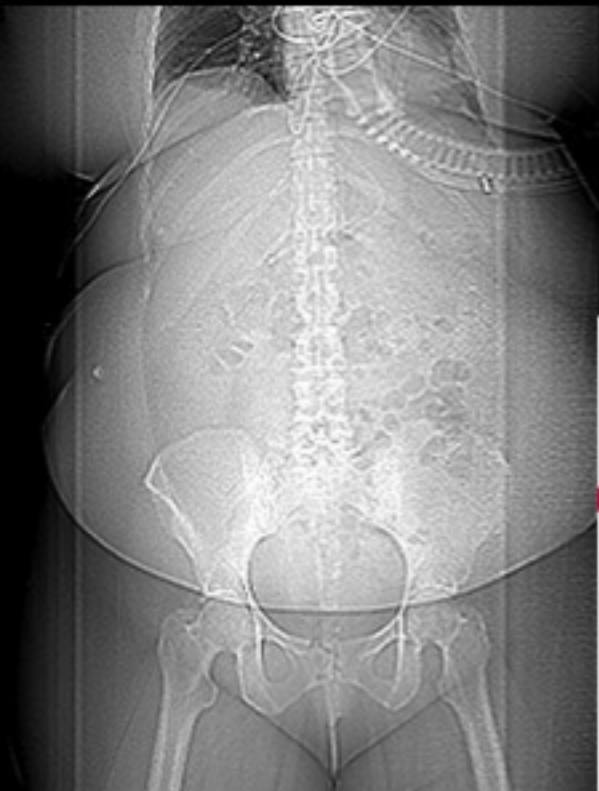


† MBA rider 'lost control' helmet dislodged on impact.

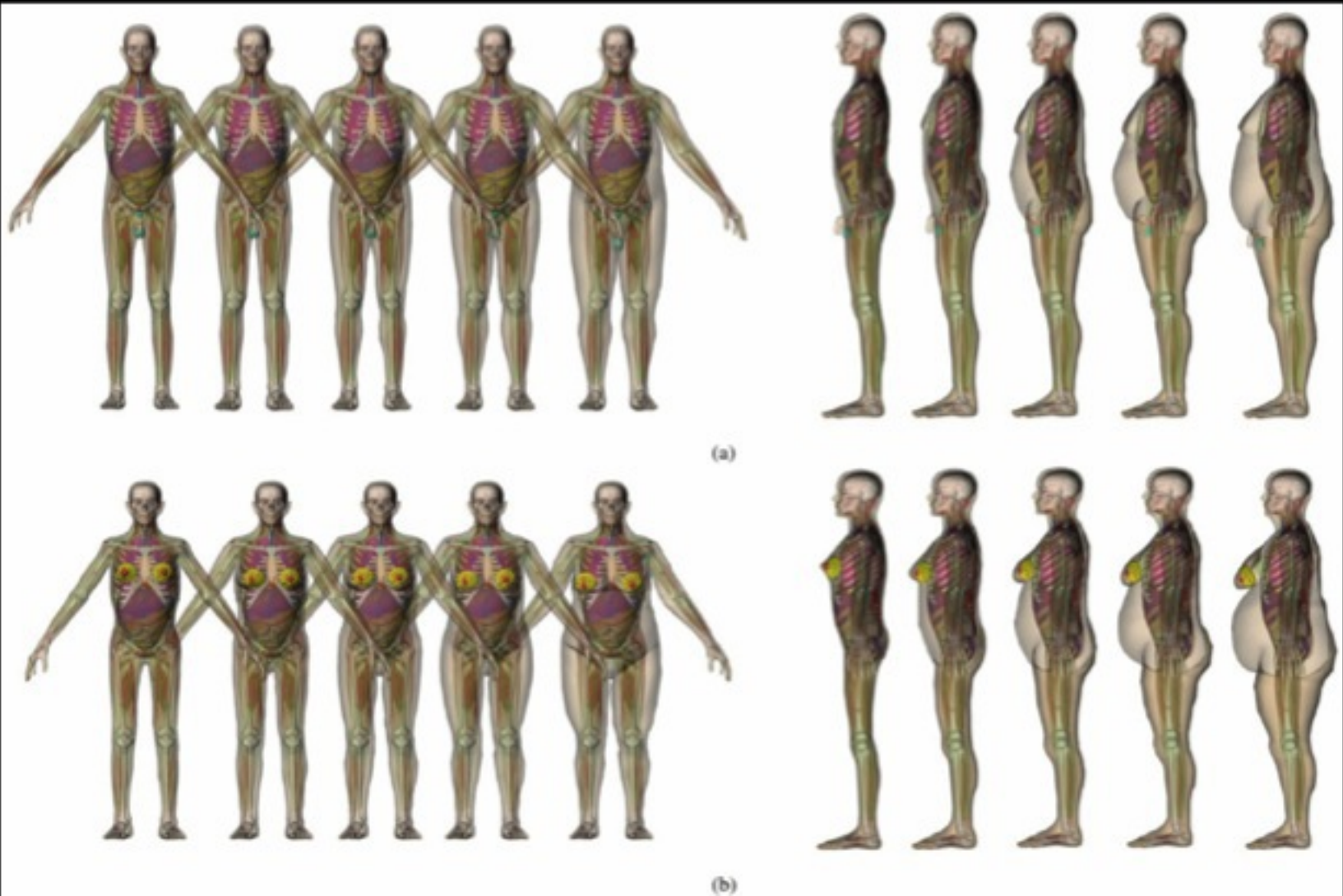


1hr 40min in CT Scanner?

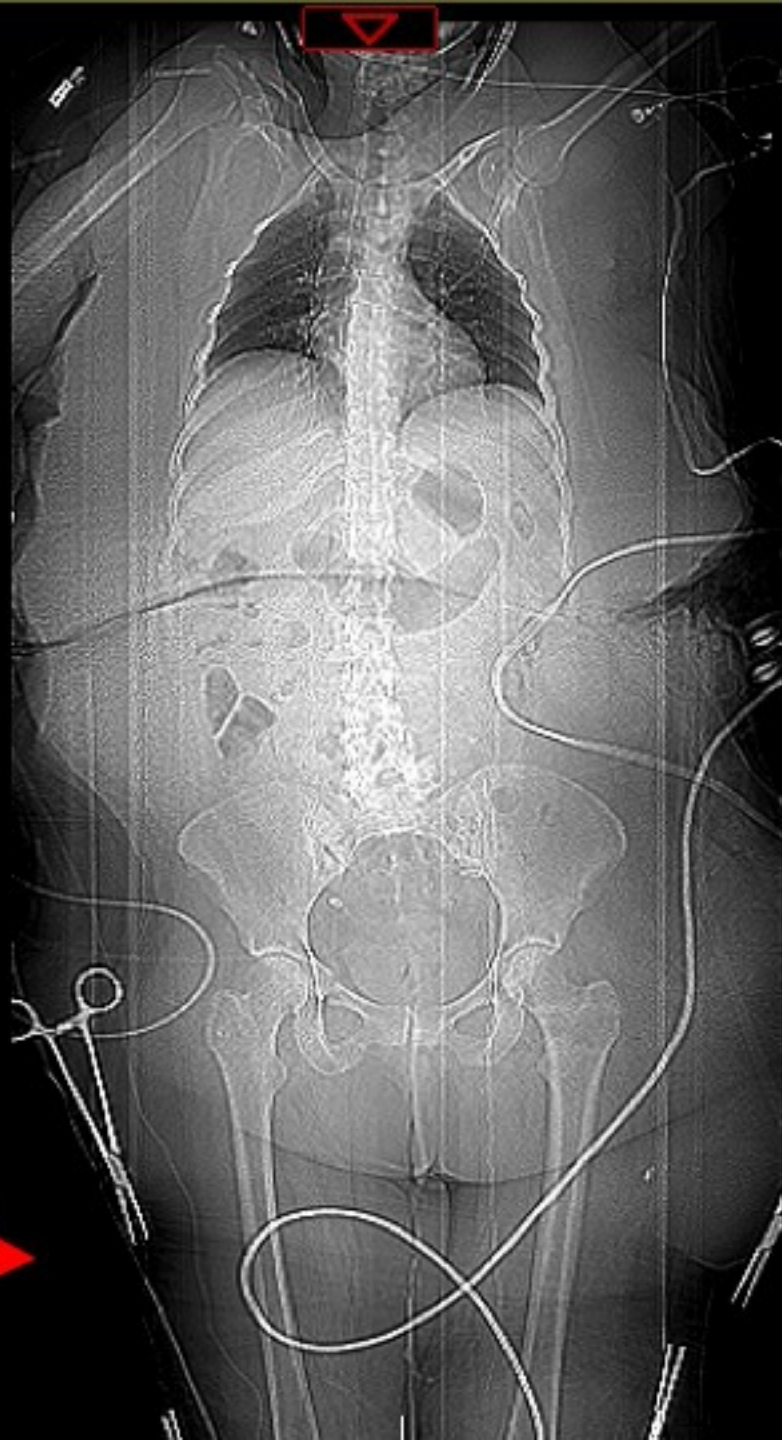
CT scan and obesity



Impact: Assessment



(IV)



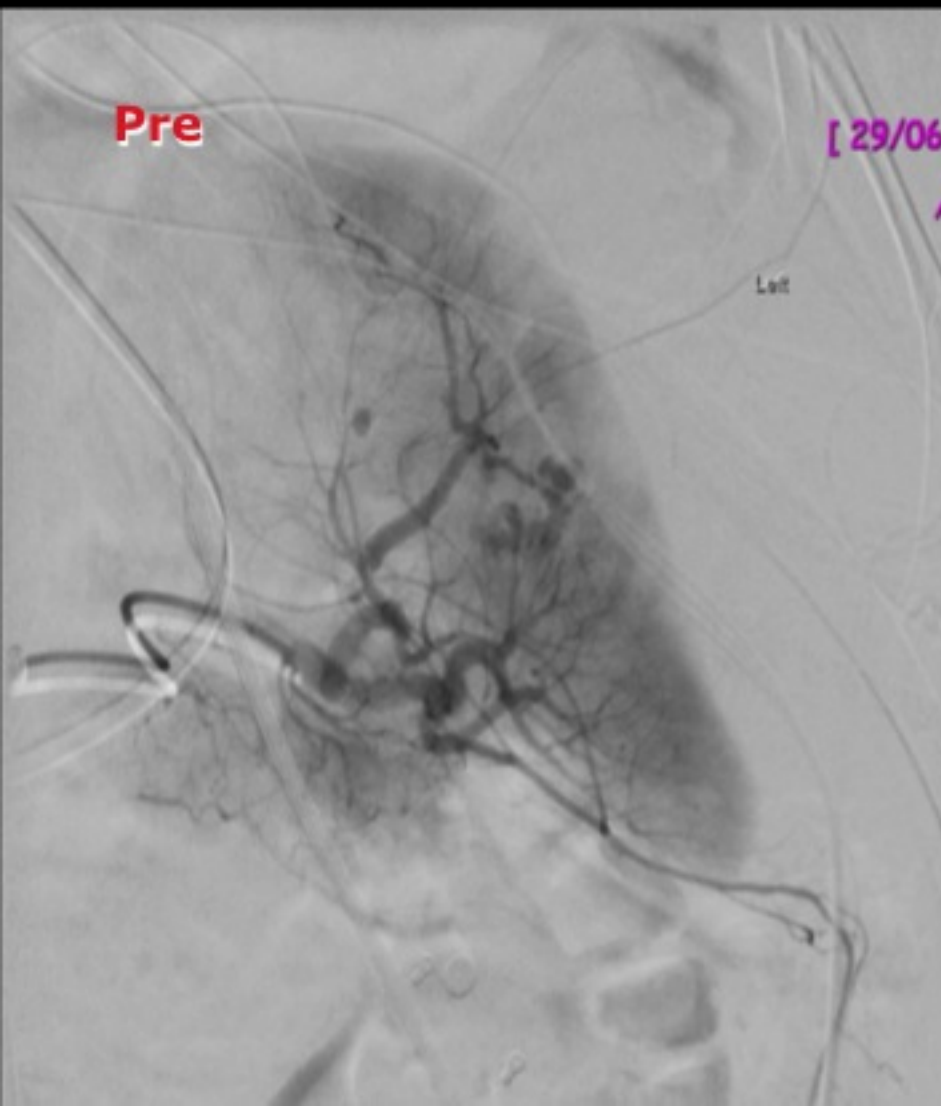
Impact: Treatment

RECT MOBILE WITH GRID



... MBA rider 'lost control' helmet dislodged on impact.

Splenic Embolisation



Impact: Complications

- Increased mortality of 20%
- Common complications
 - MOF
 - Pneumonia
 - Sepsis
 - ARDS
 - Renal Failure
 - AMI
 - DVT & PE

Outcomes

- Prolonged LOS
 - Prolonged ICU stay
 - Slow to wean
 - Poor wound healing
 - NWB – 6 weeks
 - Poor compliance to diet
 - Personal hygiene issues
 - Psychosocial issues
 - Multiple readmissions
 - Chronic pain issues
 - 178kg → 128kg
- Prolonged LOS
 - Rebleed spleen
 - Angioembolisation
 - Prolonged ICU stay
 - Slow to wean
 - Respiratory failure
 - Unable to DB&C
 - Mobility issues
 - Slept in chair
 - Chronic pain issues
 - 190kg → 160kg

Nutrition

Goals

- Early aggressive nutritional support to optimize protein intake
- Neutralize excessive catabolism
- Hypocaloric nutrition $<20\text{kcal/kg/day}$ to avoid overfeeding syndrome in severely injured obese ICU patients

Limitations

- Nil by mouth for multiple surgeries
- Large wound output for first few days
- NBM for cancelled surgeries
- Lots of scans and investigations off ward during meals
- No appetite so was drinking tea 5 x sugars x 5 per day, cordial and sodas and soft cake from family
- Supplements built up on locker
- Didn't like the taste of protein shakes
- Stopped high protein diet and supplements as weight conscious

Impact: on staff

- Very labour intensive;
 - Require up to 6 staff to roll (especially with spinal precautions)
- Require specialist equipment and knowledge of how to use these
- Require assistance for most basic ADL's
- Staff are constantly at risk of injuring themselves
- Frustrated by resistance to change and impact on other patients
- Confronting; dealing with our own prejudices
- Relatives

John Hunter Bariatric Risk Management Plan

Sites where Guideline\ applies:

Target audience:

Description:

Keywords:

JHH-RNC Facilities including JHCH adolescent unit

All clinical staff

Bariatric management plan

Bariatric, weight, manual, handling, moving, safely, beds, equipment, JHH, RNC, JHCH, BMI, risk, OHS, safety, WHS



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Impact: Equipment

- Can get beds up to 450 kg
- Bariatric toilet seat is 300kg
- Bariatric walking frame 225kg
- FASF 350kg
- Standing MRI's
- Hearses, funeral homes & coffins



Equipment

Quiz:

Q. What weight can
the side rails take?



Equipment

Quiz:

Q. What weight can
the side rails take?

A. 70kg



Equipment

Quiz:

Q. What weight is this toilet accredited to take?



Equipment

Quiz:

Q. What weight is this toilet accredited to take?

A. 90kg



What's wrong?



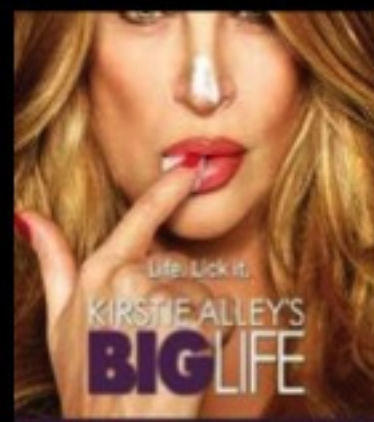
Obsessed Observers





EXCESS BAGGAGE

THE BIGGEST LOSER



EXTREME MAKEOVER WEIGHT LOSS EDITION



Summary

Morbid obesity:

- Its an epidemic and primarily a first world problem
- Impacts on all areas of trauma care:
 - More likely to be involved in accidents
 - Different injury patterns
 - Complex co-morbidities that impact on recovery
 - Higher mortality rate
 - Pose difficulties in managing these patients

Question

Are we doing
enough?