

Pain management for patients with chest trauma

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Clinical Bottom Line

- Treat life threatening events
- Assess and decide early
 - Less than 3, to go home
- Pharmacology
 - Simple analgesics
 - Opiates
 - Intravenous
 - Oral
- Invasive techniques
 - Intercostal nerve blocks
 - Thoracic epidural
 - Paravertebral nerve block

Back to the beginning

Epidemiology

- Hippocrates
 - Hemoptysis,pleurisy,empyema
- Most commonly seen after MVC
- 8% trauma admissions
- Commonest chest injury
- Marker of severity of injury
- Increased morbidity and mortality

**HAS THIS PAIN
MADE YOU TENSE ?**

NOT REALLY.



Morbidity

- Chest trauma causes pulmonary contusions
 - Ventilation perfusion mismatch
 - Decreased lung compliance
 - Hypoxemia
- Pain causes
 - Decreased coughing
 - Shallow hyperventilation
 - Reduced FRC
 - Sputum retention

The elderly

(over 65)

- Mortality 22% vs 10%
- Pneumonia 31% vs 17%
- LOS 15.4 vs 10.7 days
- Ventilators days 4.3 vs 3.1
- Intensive care days 6.1 vs 4.0
- Each additional # rib increased mortality by 19%
and pneumonia by 27%

Long term consequences

- Average time off work is 70days
- Pain at 1 month still averages 3.5/10
- Chronic pain not been assessed

What did we do?

- Strapping the chest wall
- External stabilisation of chest wall
- Early ventilation for all people with flail chest

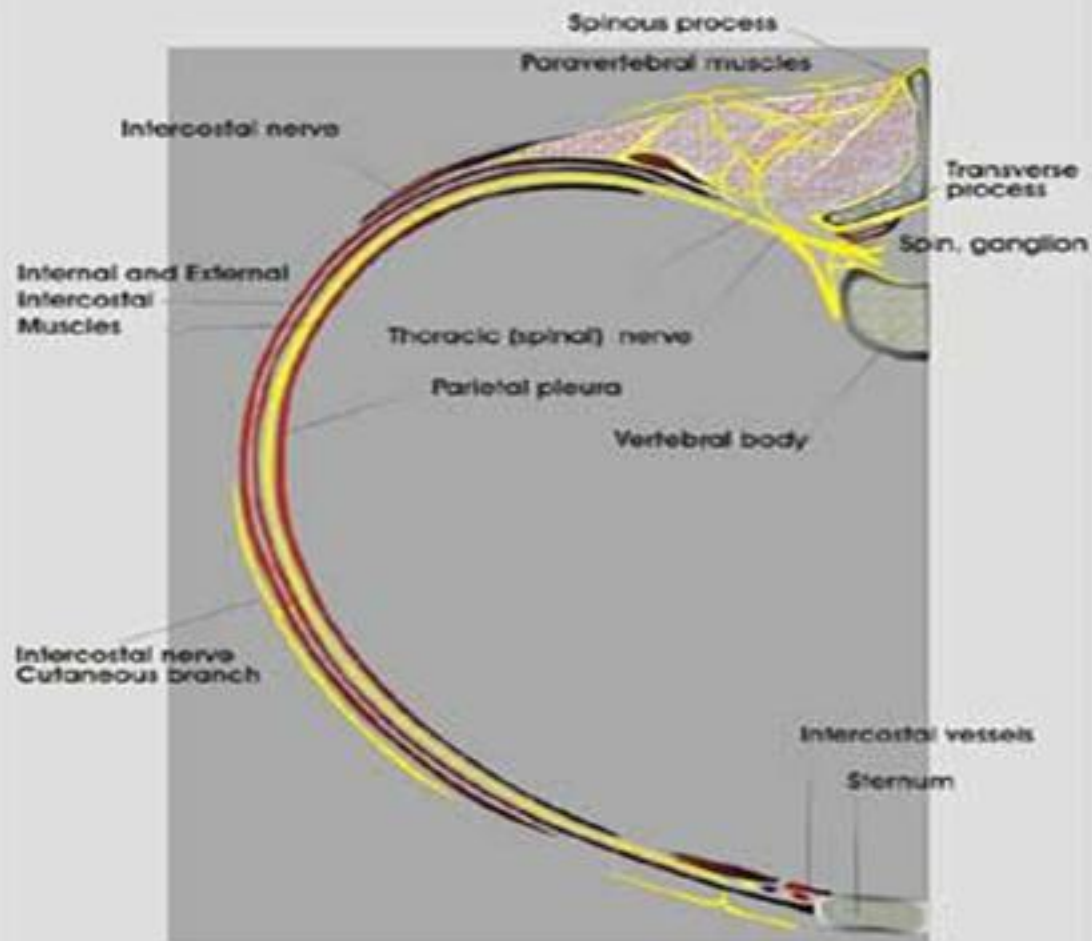
So what now?

- Early and effective pain control
- Aggressive respiratory therapy
- Avoid fluid overload
- Early mobilisation

Effective pain management

- Enables deep breathing and coughing
- Less than 3 #s
 - oral analgesics, NSAIDS paracetamol, weak opiates
 - intercostal nerve blocks
- More extensive
 - Intravenous opiates, IV protocol or PCA
 - Sedation, respiratory depression, cough suppression
 - Regional techniques shown to be better

Intercostal nerve blocks



Pro's and con's

■ Advantages

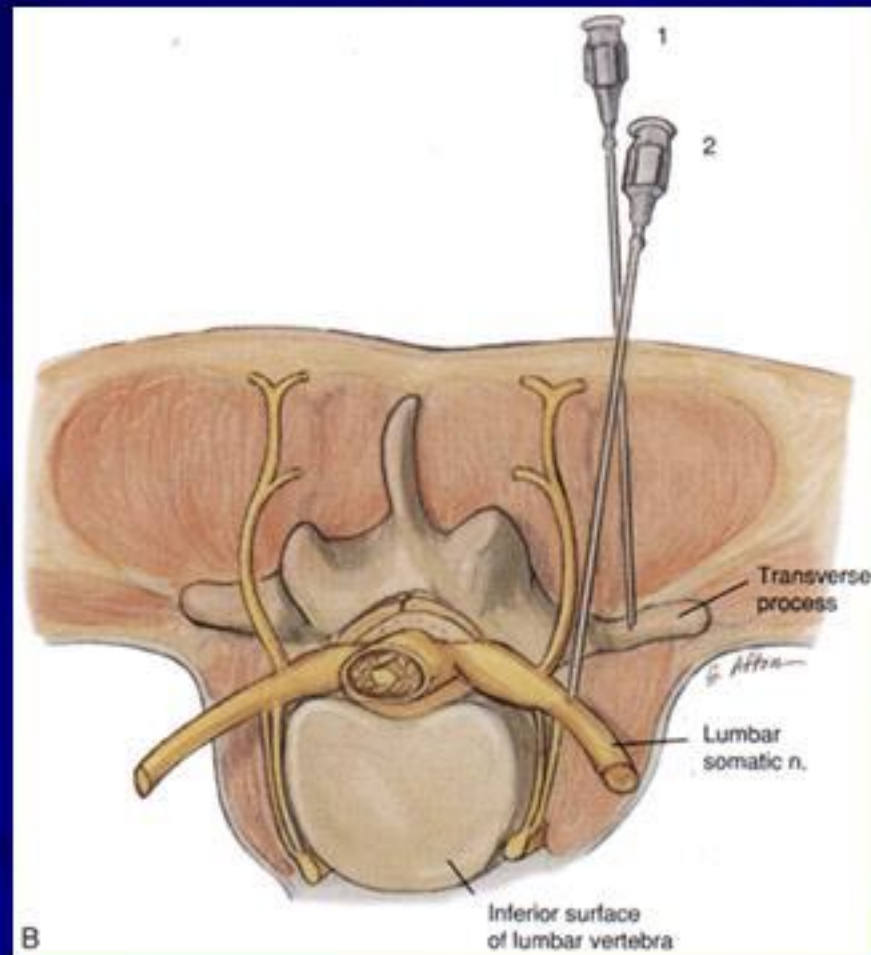
- No CNS depression
- Effective for 8-24 hours
- Can put in a catheter

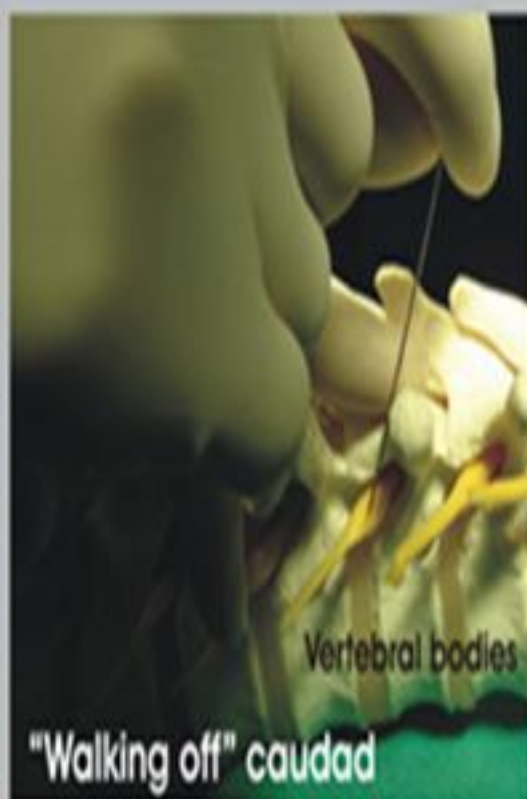
■ Disadvantages

- Risk of pneumothorax
- Not suitable for posterior rib fractures
- Multiple injections
- Difficult for first seven ribs



Paravertebral nerve block





Pro's and con's

■ Advantages

- Simpler, safer, easier than an epidural
- No CNS depression
- Haemodynamically stable
- Normal bladder function
- Normal limb power

■ Disadvantages

- Risk of pneumothorax
- Unpredictable spread
- Few Anaesthetists confident to do it

Thoracic epidural



Thoracic epidural

- Decreased mortality and pulmonary morbidity in the elderly
- Increased FRC, lung compliance, vital capacity and PaO₂
- Shallow breathing becomes near normal
- Shorter ICU and hospital stays

The down side

- Difficult to do with patients in pain
- Hypotension compounding hypovolaemia
- Mask intra-abdominal trauma
- Mask delayed haemothorax
- Coagulopathy made precipitate a haematoma
- Infection, puritis, nausea, urinary retention
- Motor blockade

Other options

- Intrathecal opiates
- Intrapleural block
- TENS machine

Choice of analgesic technique

- Pain relief needs to be individualised
 - Less than 3# ribs oral analgesia +/- ICNB
 - Patients requiring immediate surgery are best managed with intravenous opiates
 - Regional techniques can be added in latter
 - Head injury and spinal trauma are contraindication for epidural analgesia

Real World

- 94% of patients with multiple rib fractures have other injuries
- 55% require surgery
- Haemodynamically stable, pneumothorax/haemothorax drained
- Abdominal visceral damage excluded
- This all takes time, during which IV opiates are the treatment of choice