Emergency thoracic surgery

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Introduction

• What is emergency thoracic surgery?
• How is the non-elective patient disadvantaged?
• Enhanced recovery approach to the non-elective patient
• Lessons learned from elective pathways
What is “emergency” thoracic surgery?

- Non-elective urgent thoracic surgery
- 25% of workload
- Predominantly pleural disease
Pleural disease

Pleural fluid:
• Pleural effusion
• Empyema
• Haemothorax

Pleural air:
• Primary pneumothorax
• Secondary pneumothorax
How is the non-elective patient disadvantaged?

• No access to ERAS pre-operative pathway
• Functional decline as a result of hospitalisation
• Physiological insult of the illness
ERAS pre-op pathway: The patient is in the best possible condition for surgery

- Pre-operative
  - Pre-operative assessment clinic
  - Optimise medically
  - Smoking cessation
  - Patient education
  - Nutritional assessment
  - Prehabilitation
ERAS pre-op pathway: The patient is in the best possible condition for surgery

- Admission
  - Day-of-surgery admission
  - Planned theatre time
  - Avoidance of fasting
Non-elective pathway

Illness at home

Admission to local hospital

Non-surgical treatment

Transfer request to thoracic unit

Assessment at thoracic unit

Surgery

- Reduced physical activity
- Deconditioning
- Functional decline
Non-elective pathway

Illness at home

Admission to local hospital

Non-surgical treatment

Transfer request to thoracic unit

Assessment at thoracic unit

Surgery

CRG standard

Reality
- External transfers 24%
- Internal transfers 63%

2 days
Pre-operative fasting

• Elective ERAS pathway:
  – Avoidance of fasting
  – Carbohydrate loading
  – Maximise hydration

• Non-elective reality:
  – Fast for fluids: 13 hours
  – Fast for solids: 18 hours

• Unplanned theatre slot
• Dogma
Hospitalisation, deconditioning and functional decline

- Hospitalisation results in reduced activity
- Majority of time is spent in bed, irrespective of medical condition
- Deconditioning occurs quickly with loss of strength, power and aerobic capacity
- This process is accelerated by surgery
- Resultant functional decline usually temporary
- However, premorbid functional status impacts on ability to recover
Acute illness

Hospitalisation

↓ Physical activity

↑ Deconditioning

↑ Functional decline

↑ Surgical stress

↑ Complications

↑ LOS

↑ Mortality

After Hoogeboom et al, Curr Opin Anaesthesiol. Apr 2014; 27(2): 161–166
Acute illness

Hospitalisation → Acute illness → Physical activity → Deconditioning → Functional decline

↑ Deconditioning

↑ Functional decline → ↑ Complications → ↑ LOS

↑ Complications → ↑ LOS, ↑ Mortality

↑ Surgical stress → Sepsis → Fasting → Dehydration

↑ Surgical stress, Comorbidities

↓ Physical activity

After Hoogeboom et al, Curr Opin Anaesthesiol. Apr 2014; 27(2): 161–166
Are all ERAS elements important in elective surgery?

Association between adherence to ERAS elements and outcome following CRC surgery.

Gustafsson et al. *Arch Surg.* 2011;146(5):571-577
Are all ERAS elements important in elective thoracic surgery?

<table>
<thead>
<tr>
<th>Pre-operative</th>
<th>Attended pre-operative assessment</th>
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<tbody>
<tr>
<td></td>
<td>Assessed as fit for surgery</td>
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<td>Patient counselling</td>
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<td>Admitted on day of surgery</td>
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<td></td>
<td>Carbohydrate loading</td>
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<td></td>
<td>Avoidance of premedication</td>
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<td>Intra-operative</td>
<td>Antibiotics prior to incision</td>
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<td></td>
<td>Regional anaesthesia</td>
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<td></td>
<td>Goal-directed fluid therapy</td>
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<td></td>
<td>Warming</td>
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<tr>
<td>Post-operative</td>
<td>Avoidance of IV fluids</td>
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<td>Avoidance of opiates</td>
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<td>Early enteral nutrition</td>
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<td>Targeted nausea and vomiting control</td>
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<td>Mobilisation within 24 hours</td>
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</table>
Are all ERAS elements important in elective thoracic surgery?

Strong association between ERAS compliance and delayed discharge, p<0.001
Are all ERAS elements important in elective thoracic surgery?

- A predictive scoring system for delayed discharge was calculated

- \((0.005 \times \text{age in years}) + (0.237 \times \text{COPD}) + (0.120 \times \text{surgical approach}) + (0.127 \times \text{patient counselling}) + (0.117 \times \text{regional anaesthesia}) + (0.165 \times \text{PONV}) - (0.215 \times \text{early mobilisation}) - 0.379\)

- If value >0, then a delayed discharge can be predicted

\[\text{AUC} = 0.77 \text{ (CI: 0.74-0.80)}\]
How should we approach the non-elective thoracic patient?
Pre-op approach to the non-elective thoracic patient

- Prevent deconditioning and functional decline:
  - Early transfer to surgical ward
  - Mobilise pre-op
  - Patient education

- Optimise comorbidities if time allows
- Treat sepsis

- Nutritional supplementation
- Avoidance of fasting:
  - Carbohydrate loading
  - Maximise hydration

- Planned operation date/time
Intra- and post-op approach to the non-elective thoracic patient?

Adoption of all elective ERAS elements with particular attention to:

**Intra-operative**
- Surgical approach (VATS vs. open)
- Regional anaesthesia (e.g. paravertebral catheter)
- PONV control:
  - Short-acting anaesthetic agents
  - Judicious fluid management
  - Avoid opiates

**Post-operative**
- PONV control
- Early mobilisation
Conclusions

• Non-elective patients are disadvantaged in their pre-operative preparation for surgery
• Steps should be taken to prevent deconditioning and functional decline prior to surgery
• Patients should be treated in an identical manner to elective patients in accordance with ERAS protocols
• It is likely that greater compliance with ERAS protocols favours better outcomes
Thank You