Improving in-patient outcome after idiopathic spine deformity surgery by an Enhanced Recovery Pathway (ERP) and Enhanced Recovery After Surgery (ERAS) philosophy - initial results of helping young people get better more quickly.

Sophie Adams
Donna Cowie
Enrique Garrido

Charlotte Goujon
Fiona McGovern

Mandy Sim
Joseph Fournier
Chris Adams

The Scottish National Spine Deformity Service team
Quality Improvement Project Registration: Project ID: 2017-14
Conflicts: None    Funding: None
Enhanced Recovery Pathway (ERP) and Enhanced Recovery After Surgery (ERAS) philosophy

- 1997 = “Multimodal approach to control postoperative pathophysiology and rehabilitation”

- 2017

PubMed: 28097305

PubMed: 9175983

Post-operative morbidity / Surgical Stress Response
Scottish National Spine Deformity Service
- Getting it right for each individual at all times

- Pathways from Service inception in April 2005
- Reviewed annually

- Internal on intranet
- Standards
  - U.K.
  - Protocols
  - Pathways
  - Outcomes
Enhanced Recovery and the NHS

ERP “a modern evidence-based approach that helps people recover more quickly after having major surgery.”

Important points

- Eating well
- Exercise
- Relaxation
- Smoking and alcohol

www.nhs.uk/Conditions/enhanced-recovery
Aim and Methods

• **Aim** - Assess whether incorporating an ERP benefits patient outcome.

• **PDSA cycles**
  – **Plan** starts
  – First January 2015
  – Second May 2016

• “Best Practice in Clinical Audit” Sept 2016
1. Pre Admission
   - Patient participation in recovery to normality
   - Pre-operative education
   - Service visit and former patient contact

   - Nutrition
     - Assessment (Paediatric Yorkhill Malnutrition Score - PYMS)
     - Dietary advice and education
     - “Tic Tac Training”

2. Pre Operative
   - Strategies to reduce nausea and vomiting
   - Pain
     - Expectations
     - Control

   - Nutrition
     - Laxative
   - Mobilisation education and manoeuvres
### 3. Intra Operative
- Decrease tissue damage
- Decrease surgical time
- Decrease bleeding
  - GA
  - Transexamic acid
  - Haemostatic Gelatines
- Wound infiltration
  - 1ml 0.25% levobupivicaine per Kg

### 4. Post Operative
- Aiming for normal activities
- Fluids
  - Oral
  - Urine output
- Nutrition
  - Food
- Multimodal analgesia
  - Includes non-steroidals
Patients and Methods

Group 1 – standard pathway
- PDSA – Study
- April 2015 to March 2016
- Only patients with idiopathic scoliosis
- N = 95
- Paper case notes
- TRAK and ORSOS

Group 2 - ERP
- PDSA – Study (ongoing)
- February to June 2017
- Only patients with idiopathic scoliosis
- N = 28 patients
- eCasenotes
- TRAK and ORSOS

- Statistical tests
  - F – test for variance
  - Student t-Test, two-tail

www.hqip.org.uk/resources
## Results

<table>
<thead>
<tr>
<th></th>
<th>Group 1 n= 95 Standard pathway</th>
<th>Group 2 n=28 ERP</th>
<th>Statistical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>14.9 years (11-19)</td>
<td>14.0 years (11-19)</td>
<td>NS</td>
</tr>
<tr>
<td><strong>Length of stay</strong></td>
<td>6.8 days (4-21)</td>
<td>5.7 days (3-23)</td>
<td>NS</td>
</tr>
<tr>
<td><strong>Catheter removal</strong></td>
<td>2.9 days (2-5)</td>
<td>1.3 days (1-2)</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td><strong>To chair</strong></td>
<td>2.1 days (1-5)</td>
<td>1.2 days (1-3)</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td><strong>First walking</strong></td>
<td>2.7 days (1-6)</td>
<td>1.2 days (1-3)</td>
<td>p&lt;0.001</td>
</tr>
</tbody>
</table>
Results – Morphine equivalent use

- Conversions to PO Morphine (mg)
  - IV Morphine (mg) x 2.5
  - PO Codeine (mg) x 0.1
  - PO Tramadol (mg) x 0.15
  - Transdermal Fentanyl
    - 12mcg/hr = 45mg in 24hrs
    - 6mcg/hr = 22.5mg in 24hrs

www.rcoa.ac.uk/faculty-of-pain-medicine/opioids-aware
Results – Morphine equivalent use

Group 1 (n = 20/95)  
Standard Pathway

Group 2 (n = 20/28)  
ERP

From post op day 2 onwards p = 0.023 or less
Discussion and Conclusions

• Our Enhanced Recovery Pathway
  – Discharge earlier by average of 1 day.
  – Significant less morphine equivalent analgesia.

…