The Effects of Parental Presence in the Postanesthetic Care Unit on Children’s Postoperative Behavior: A Prospective, Randomized, Controlled Study

Anxiety Factoids

- 75% children psychological and/or physiological anxiety
- Postoperative behavioral changes
  - Sleep disturbances
  - Acting out
  - Poor school performance
  - Clinging behavior
  - Enuresis
Figure 1. Negative behavioral changes as a function of postoperative time. The behavioral changes were assessed by using the Post-Hospitalization Behavioral Questionnaire (PHBQ).

(Kain et al., Anesth Analg 1998;88:1042)
Age-related Psychological Concerns

- Fear of separation
- Stranger anxiety
- Fear of the unknown – put to sleep
- Loss of control
- Fear of mutilation
- Knowing boundaries and limits
Anxiety Effects Recovery

- 1613 patient database
- Anxiety (mYPAS) modified Yale Preoperative Anxiety Scale
- PHBQ, Post-hospital behavior questionnaire
- Level anxiety as postop behavior worsens

(Kain et al., Anesth Analg 2004;99:1648)
**Figure 2.** Relationship between preoperative anxiety and emergence delirium symptoms. mYPAS = modified Yale Preoperative Anxiety Scale

(Kain et al., Anesth Analg 2004;99:1651)
Figure 3. The number of new-onset maladaptive behaviors over a 2-wk postoperative period as exhibited by groups of children with high and low preoperative anxiety. *statistical significance; $P < 0.05$

(Kain et al., Anesth Analg 2004;99:1652)
Childhood Risk Factors

- Age: 1-5 years, highest risk
- Temperament: Shy and inhibited, higher risk
  Socially adaptive, less risk
- Experience – previous medical experiences
- Parental trait anxiety: Anxious parents create anxious kids
Parental Risk Factors for Anxiety

- Divorce, lower educational levels
- Parents whose children NOT in day care
- Parents of children < 1 year of age
- Parents who were frequent patients
• Alberta Children’s Hospital
• Children 2 to 9 years
• Elective surgery ASA 1 & 2
• Appropriate patient exclusions
• Computer generator randomized
• Blinded until patient entry to PACU
  (intraop Rx unaffected)
Anesthetic Technique

• All patients 8 min video and brochure
• Hospital preparation program not standard practice
• Premed anesth technique: anesthesiologist’s discretion
• Parental presence allowed
PACU Parental Presence

• 1 parent throughout but after
  – PACU – anesthesia handoff
  – VSS, airway secure
  – Patient opened eyes

• Non-parent – patient reunited in SDS
Behavior Assessment

• PACU behavior – Cole scale
  1. Sleeping
  2. Awake, calm
  3. Irritable, crying
  4. Inconsolable
  5. Severe restlessness
Behavior – 2 weeks

• Post-hospital behavioral questionnaire (PHBQ)
• Mail in form (phone reminder, 2 weeks)
• Behavioral changes defined
  – Frequency of negative behavioral change
  – 2 components rated as more or much more than before hospitalization
Results I

- Appropriate Statistics

Figure 1. Flow chart depicting patient flow through the study.

# Results II

<table>
<thead>
<tr>
<th>Variable</th>
<th>Parent absent</th>
<th>Parent present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (y)</td>
<td>4.9 (1.9)</td>
<td>4.7 (1.9)</td>
</tr>
<tr>
<td>ASA physical status I/II (n)</td>
<td>130/17</td>
<td>132/15</td>
</tr>
<tr>
<td>Stay at home parent (%)</td>
<td>44.2</td>
<td>41.5</td>
</tr>
<tr>
<td>Previous hospitalization (%)</td>
<td>34.0</td>
<td>36.9</td>
</tr>
<tr>
<td>Previous surgery (%)</td>
<td>30.6</td>
<td>29.4</td>
</tr>
<tr>
<td>Number of previous surgeries</td>
<td>1.4 (0.8)</td>
<td>1.4 (0.8)</td>
</tr>
<tr>
<td>Attendance at preparation program (%)</td>
<td>20.4</td>
<td>23.3</td>
</tr>
<tr>
<td>Socioeconomic status low/middle/high (%)</td>
<td>23.1/42.9/34.0</td>
<td>29.9/51.0/19.1F</td>
</tr>
<tr>
<td>Parental presence at induction (%)</td>
<td>65.3</td>
<td>72.1</td>
</tr>
<tr>
<td>mYPAS on admission</td>
<td>27.5 (7.5)</td>
<td>28.1 (8.7)</td>
</tr>
<tr>
<td>mYPAS on induction</td>
<td>45.3 (26.2)</td>
<td>44.8 (24.9)</td>
</tr>
<tr>
<td>Use of regional anesthesia (%)</td>
<td>66.2</td>
<td>65.9</td>
</tr>
<tr>
<td>Volatile anesthesia (%)</td>
<td>99.3</td>
<td>99.3</td>
</tr>
<tr>
<td>Intravenous maintenance (%)</td>
<td>2.8</td>
<td>4.3</td>
</tr>
<tr>
<td>Intraoperative narcotic analgesia (%)</td>
<td>63.0</td>
<td>49.3 *</td>
</tr>
</tbody>
</table>

Mean (±sd) for continuous variables, % for categorical data.
mYPAS = modified Yale Preoperative Anxiety Scale.

Results III

<table>
<thead>
<tr>
<th>Operation</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dental restorations</td>
<td>52</td>
</tr>
<tr>
<td>Tonsillectomy ± adenoidectomy</td>
<td>49</td>
</tr>
<tr>
<td>Circumcision/meatoplasty/hypospadias</td>
<td>30</td>
</tr>
<tr>
<td>Strabismus</td>
<td>23</td>
</tr>
<tr>
<td>Inguinal hernia/hydrocele</td>
<td>22</td>
</tr>
<tr>
<td>Adenoidectomy ± diathermy turbinates</td>
<td>22</td>
</tr>
<tr>
<td>Umbilical hernia</td>
<td>21</td>
</tr>
<tr>
<td>Skin/subcutaneous lesion excision</td>
<td>19</td>
</tr>
<tr>
<td>Orchidopexy</td>
<td>16</td>
</tr>
<tr>
<td>Combined procedures</td>
<td>17</td>
</tr>
<tr>
<td>Other</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>294</td>
</tr>
</tbody>
</table>

### Results IV

#### Table 4. Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Parent absent</th>
<th>Parent present</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion time after initial eye opening with behavior score 3, 4, or 5 (%)</td>
<td>27.9 (30.4)</td>
<td>26.5 (27.7)</td>
<td>0.694</td>
</tr>
<tr>
<td>Negative behavior change at 2 wk (%)</td>
<td>45.8</td>
<td>29.3</td>
<td>0.007</td>
</tr>
<tr>
<td>Time in postanesthetic care unit (min)</td>
<td>39.7 (18.1)</td>
<td>41.1 (12.4)</td>
<td>0.422</td>
</tr>
</tbody>
</table>

Results V

- Regression analysis – negative behavior
- Age < 5
- Parental presence PACU
- Greater CHEOPS Score return to SDS
- Intraoperative opioid and SES → NS
Results VI

- Only 2 patients premedicated/ group
- Higher intraoperative opioid not explained
summary
A Proposal for Training in Pediatric Cardiac Anesthesia