A collaborative quality improvement intervention was effective for promoting use of surfactant therapy in preterm infants


Is a multifaceted quality improvement intervention based on 4 key habits (change, evidence-based practice, systems thinking, and collaborative learning) effective for promoting use of surfactant therapy in preterm infants?

**METHODS**

- **Design:** cluster randomised controlled trial.
- **Allocation:** concealed.
- **Blinding:** unclear.
- **Follow up period:** until discharge from hospital.
- **Setting:** 114 neonatal intensive care units (NICUs) in North America.
- **Patients:** 6182 preterm infants (23–29 wks gestation, birth weights 401–1500 g) who did not have major birth defects.
- **Intervention:** 57 NICUs were allocated to a multifaceted, collaborative, quality improvement intervention involving audit and feedback, an interactive training workshop based on 4 key habits (change, evidence-based practice, systems thinking, and collaborative learning) and ongoing faculty support (intervention NICUs, 3332 patients). 57 NICUs were allocated to receive centre specific confidential routine reports (control NICUs, 2850 patients).
- **Outcomes:** proportion of infants receiving a first dose of surfactant in the delivery room, proportion of infants receiving a first dose of surfactant >2 hours after birth, median time from birth to first dose of surfactant, mortality before hospital discharge, and pneumothorax.
- **Patient follow up:** 98% (mean gestational age 27 wks, mean birth weight 933 g, 46% girls; intention to treat analysis). All 114 NICUs were included in follow up analyses.

**MAIN RESULTS**

More infants in the intervention NICUs received surfactant therapy in the delivery room, and fewer received a first dose of surfactant 2 hours after birth (table). The groups did not differ for mortality before hospital discharge or pneumothorax (table). Infants in intervention NICUs received first surfactant therapy sooner after birth than those in control NICUs (median 21 v 78 min, adjusted hazard ratio 1.57, 95% CI 1.42 to 2.07).

**CONCLUSION**

A multifaceted, collaborative, quality improvement intervention based on 4 key habits was effective for promoting use of evidence-based surfactant therapy in preterm infants.

---

### Table

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Intervention</th>
<th>Control</th>
<th>RBI (95% CI)</th>
<th>NNT (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surfactant given in delivery room</td>
<td>55%</td>
<td>18%</td>
<td>200% (176 to 228)</td>
<td>3 (3 to 3)</td>
</tr>
<tr>
<td>First dose of surfactant &gt;2 h after birth</td>
<td>9%</td>
<td>25%</td>
<td>62% (57 to 67)</td>
<td>7 (6 to 8)</td>
</tr>
<tr>
<td>Mortality before hospital discharge</td>
<td>17.8%</td>
<td>18.2%</td>
<td>2% (–9 to 12)</td>
<td>Not significant</td>
</tr>
<tr>
<td>Pneumothorax</td>
<td>6.6%</td>
<td>7.4%</td>
<td>11% (–7 to 26)</td>
<td>Not significant</td>
</tr>
</tbody>
</table>

*Abbreviations defined in glossary; RBI, RRR, NNT, and CI calculated from data in article.*