UNINTENDED EXTUBATION: IMPROVING CARE FOR THE PEDIATRIC TRAUMA POPULATION

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Unintended Extubations

Loss or displacement of the endotracheal tube prior to decision to extubate by the primary care team
Complications of Unintended Extubation

- Increase ventilator days
- Nosocomial infections
- Prolonged ICU stay
Unintended Extubation Events (N=102)

- Q3 2011: Chest compressions 5, Code medications 1, Re-intubation 21
- Q4 2011: Chest compressions 1, Code medications 0, Re-intubation 14
- Q1 2012: Chest compressions 1, Code medications 1, Re-intubation 6
- Q2 2012: Chest compressions 2, Code medications 1, Re-intubation 6
- Q3 2012: Chest compressions 3, Code medications 3, Re-intubation 12
- Q4 2012: Chest compressions 1, Code medications 0, Re-intubation 3

Legend:
- Chest compressions
- Code medications
- Re-intubation
Event Root Cause Analysis

- Demographics
  - Level of sedation
  - Patient activity
- Unintended extubation
  - Staffing
  - ETT placement
- Positioning & Safety
Event Root Cause Analysis

Demographics
Age, Diagnosis, # ventilator days

Unintended extubation

Staffing
Level of sedation
Patient activity
ETT placement
Positioning & Safety
Event Root Cause Analysis

Demographics

Staffing

Level of sedation
Prn medications vs drips

Unintended extubation

ETT placement

Patient activity

Positioning & Safety
Event Root Cause Analysis

Demographics

Level of sedation

Patient activity
Restraints, procedures, interventions

Unintended extubation

Staffing

ETT placement

Positioning & Safety
Event Root Cause Analysis

Demographics

Unintended extubation

Level of sedation

Patient activity

Positioning & Safety
Active repositioning, tape secure, restraint use

Staffing

ETT placement
Event Root Cause Analysis

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Demographics

Staffing

Unintended extubation

Level of sedation

Patient activity

Positioning & Safety

ETT placement
Oral vs nasal
Placement on x-ray
Event Root Cause Analysis

Demographics

**Staffing**
1:1, paired

**ETT placement**

Unintended extubation

Level of sedation

Patient activity

Positioning & Safety
Quarterly Unintended Extubation Rates

UF/100 vent days

Q1  Q2  Q3  Q4  Q1  Q2  Q3  Q4  Q1  Q2  Q3  Q4  Q1  Q2  Q3  Q4

Children's National
Quarterly Unintended Extubation Rates

![Graph showing quarterly unintended extubation rates from 2008 to 2015. The graph indicates a decrease in rates after the introduction of an Airway Protection Team in 2011.](Image)
Quarterly Unintended Extubation Rates

![Graph showing quarterly unintended extubation rates from 2008 to 2015. The graph highlights a significant decrease in rates post-standardized taping.](image-url)
Quarterly Unintended Extubation Rates

Airway compliance bundle with weekly audits
Airway Compliance Bundle

ETT position verification – CXR, visual cue

Team presence at X-ray rounds

Upper extremity restraints

Standardized ETT tape

Sedation phase
Comparison of Annual Unintended Extubation Rates
Comparison of Annual Unintended Extubation Rates

- PICU
- Trauma/Burn

Unintended Extubations – Trauma Patients

N=6

100% lacked therapeutic sedation regimen

50% risk for neurologic deficit

33% required re-intubation – inhalation injury
## Population Differences

<table>
<thead>
<tr>
<th></th>
<th>PICU</th>
<th>Trauma/Burn</th>
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<tbody>
<tr>
<td>Average age</td>
<td>51 months</td>
<td>88 months</td>
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<tr>
<td>Median age</td>
<td>24 months</td>
<td>90 months</td>
</tr>
<tr>
<td>Reintubation rate</td>
<td>45%</td>
<td>33%</td>
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<tr>
<td>Rate of continuous sedation use</td>
<td>71%</td>
<td>0%</td>
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Implications for the Pediatric Trauma/Burn Population

Improved sedation practices

Communicated sedation plan

Extubation readiness criteria