Videographic Assessment of Pediatric Endotracheal Intubation in the Covid-19 Era: A Report from the Videography in Pediatric Resuscitation Collaborative

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Abstract: 224
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Background:

- Endotracheal intubation (ETI) of critically ill children is a high acuity, low frequency procedure in the PED

- COVID-19 and associated PPE requirements, limitations on in-room personnel, communication difficulties, and equipment changes have created new complexities to ETI

- Videography in Pediatric Resuscitation Collaborative (VIPER) consists of four tertiary pediatric institutions who regularly use video review of actual pediatric resuscitations in the PED for quality, safety, and research.

Objective:

To use video review to compare intubator training level, first-attempt ETI success and presence of hypoxia during ETI attempts in the pediatric emergency department in the pre-COVID and COVID era.
METHODS: RETROSPECTIVE, MULTICENTER, VIDEO-BASED COHORT STUDY

Inclusion:
- All children <18 years old undergoing emergent ETI between 1/1/2019-6/1/2020 in whom video recordings were available

Data collected:
- Patient age
- Intubator Background (type and level of training)
- Outcomes:
  - First attempt intubation success
  - Presence of hypoxia (SpO2 <90%) during ETI
- Intubator and Outcomes were verified through independent video reviews

Analysis:
- Data was compared before (PRE) and after (POST) implementation of COVID-19 airway protocols
- Univariate analysis comparing PRE and POST for both outcomes was done by Chi-square testing.
- Multivariate analysis with a generalized estimating equation to control for clustering by site was done to determine the independent association between PRE and POST and outcomes.

LiveCapture, B Line Medical
Example of Software Utilized for Video Review
## RESULTS

Patient and Intubator Demographics During PRE and POST COVID-19 Airway Protocols

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<thead>
<tr>
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<tbody>
<tr>
<td><strong>Total Intubations</strong></td>
<td>239</td>
<td>33</td>
<td></td>
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<tr>
<td><strong>Patient Age (n, %)</strong></td>
<td></td>
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<tr>
<td>&lt;1 month</td>
<td>27 (11.3)</td>
<td>3 (9.1)</td>
<td>0.439</td>
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<tr>
<td>1-23 month</td>
<td>88 (36.8)</td>
<td>9 (27.3)</td>
<td></td>
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<tr>
<td>2-7 year</td>
<td>50 (20.9)</td>
<td>11 (33.3)</td>
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<tr>
<td>8 year or older</td>
<td>74 (31.0)</td>
<td>10 (30.3)</td>
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<tr>
<td><strong>Intubator Training/Background (n, %)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resident</td>
<td>55 (23.0)</td>
<td>3 (9.1)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Fellow</td>
<td>127 (53.1)</td>
<td>6 (18.2)</td>
<td></td>
</tr>
<tr>
<td>Attending (PEM)</td>
<td>25 (10.5)</td>
<td>5 (15.2)</td>
<td></td>
</tr>
<tr>
<td>Anesthesiology</td>
<td>31 (13.0)</td>
<td>18 (54.5)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>1 (0.4)</td>
<td>1 (3.0)</td>
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* Indicates statistical significance
Outcomes During PRE and POST COVID-19 Airway Protocols

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<tr>
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<tr>
<td>First Attempt Intubation Success (n, %)</td>
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<tr>
<td>Yes</td>
<td>155 (64.9)</td>
<td>28 (84.9)</td>
<td>0.02*</td>
</tr>
<tr>
<td>No</td>
<td>84 (35.2)</td>
<td>5 (15.2)</td>
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<tr>
<td>SpO2 &lt;90% During Intubation (n, %)</td>
<td></td>
<td></td>
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<tr>
<td>Present</td>
<td>35 (14.6)</td>
<td>4 (12.1)</td>
<td>0.70</td>
</tr>
<tr>
<td>Not Present</td>
<td>204 (85.4)</td>
<td>29 (87.9)</td>
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</tbody>
</table>

* Indicates statistical significance

Multivariate analysis:
When controlling for intubator background, POST phase was associated with greater first attempt intubation success (AOR 2.4, 95% CI 1.6-3.7).
- A generalized estimating equation to control for clustering by site was used.
Pediatric endotracheal intubation in the COVID-19 era is associated with increased first attempt success when compared to the pre-COVID era, even when controlling for intubator training/background.
Limitations:

- Low number of intubations in POST phase
- Selection bias re: type of intubator even within the same category of training/background
  - For example: more senior fellows may be intubating relative to more junior fellows
- Residual Confounding
- COVID-19 process changes may have contributed secondarily to increased first pass success
  - Heightened risk awareness leading to clinical “Hawthorne effect”

Questions:
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