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

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BACKGROUND/OBJECTIVE

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.

The Children's Hospital of Philadelphia

Cincinnati Children's
changing the outcome together

Children's Hospital Colorado

Children's National

METHODS: RETROSPECTIVE, MULTICENTER, VIDEO-BASED COHORT STUDY

Inclusion:

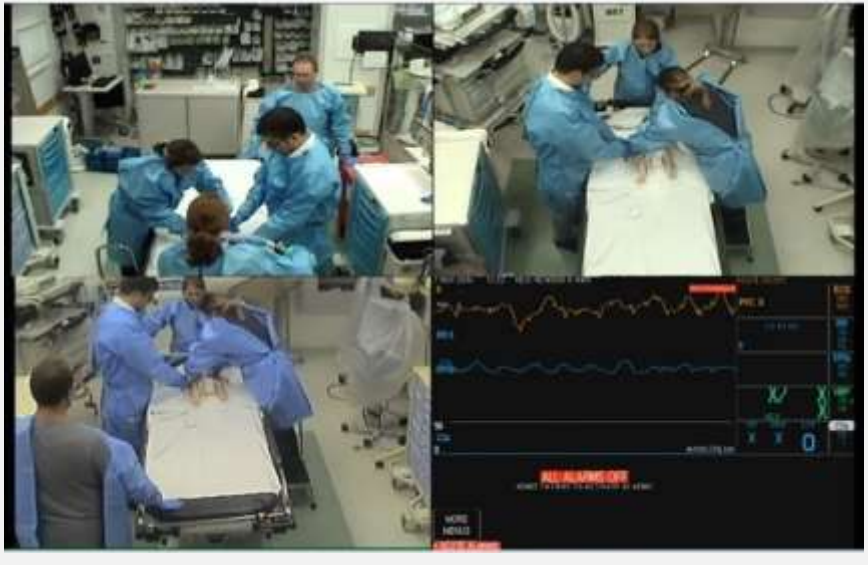
- All children <18 years old undergoing emergent ETI between 1/1/2019-6/1/2020 in whom video recordings were available

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

	PRE (1/2019-2/2020)	POST (3/2020-5/2020)	P-value
Total Intubations	239	33	
Patient Age (n, %)			0.439
<1 month	27 (11.3)	3 (9.1)	
1-23 month	88 (36.8)	9 (27.3)	
2-7 year	50 (20.9)	11 (33.3)	
8 year or older	74 (31.0)	10 (30.3)	
Intubator Training/Background (n, %)			**<0.001***
Resident	55 (23.0)	3 (9.1)	
Fellow	127 (53.1)	6 (18.2)	
Attending (PEM)	25 (10.5)	5 (15.2)	
Anesthesiology	31 (13.0)	18 (54.5)	
Other	1 (0.4)	1 (3.0)	

* Indicates statistical significance

RESULTS CONTINUED

Outcomes During PRE and POST COVID-19 Airway Protocols

	PRE (1/2019-2/2020)	POST (3/2020-5/2020)	P-value
First Attempt Intubation Success (n, %)			**0.02***
Yes	155 (64.9)	28 (84.9)	
No	84 (35.2)	5 (15.2)	
SpO2 <90% During Intubation (n, %)			0.70
Present	35 (14.6)	4 (12.1)	
Not Present	204 (85.4)	29 (87.9)	

* 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.

CONCLUSION

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.

DISCUSSION

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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