

Standardized Airway Boxes in the Emergency Department: A Quality Improvement Project

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Faculty Disclosure

- I have nothing to disclose

Introduction

Currently, the Medical Center Bowling Green Emergency Department does not have standardized airway supply boxes for intubations. With the current variation of organization and standardized location of supplies, this can result in confusion of exact supply locations during intubations.

We planned to survey ED staff, implement standardized airway boxes, and then re-survey the staff to evaluate perceived improvement.

Introduction

There was no direct patient data accessed during this project.

Staff participation in the survey is voluntary and responses are de-identified.

Survey

This is the link to see the results.

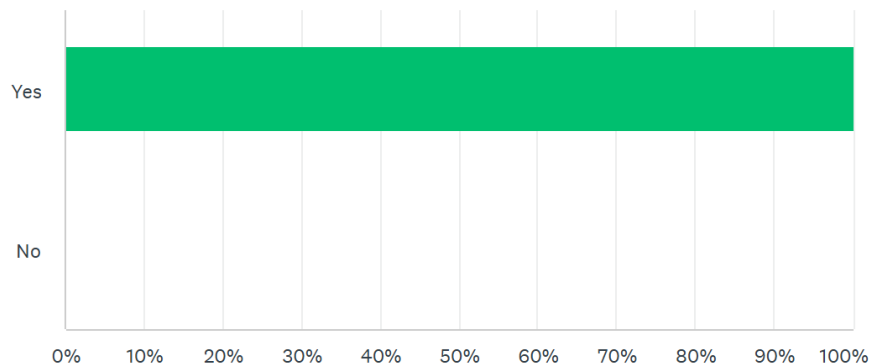
https://www.surveymonkey.com/results/SM-BGuqxQeGKv8iCl_2F_2Fjw3JTA_3D_3D/

1. This survey is regarding airway supplies and equipment in MCBG ED rooms #1 & #2. By completing this survey, you are agreeing to be a part of the study. All information will be aggregated and de-identified. Do you agree?
 - a. Yes
 - b. No

Q1

This survey is regarding airway supplies and equipment in MCBG ED rooms #1 and #2. By completing this survey, you are agreeing to be a part of the study. All information will be aggregated and de-identified. Do you agree?

Answered: 9 Skipped: 0



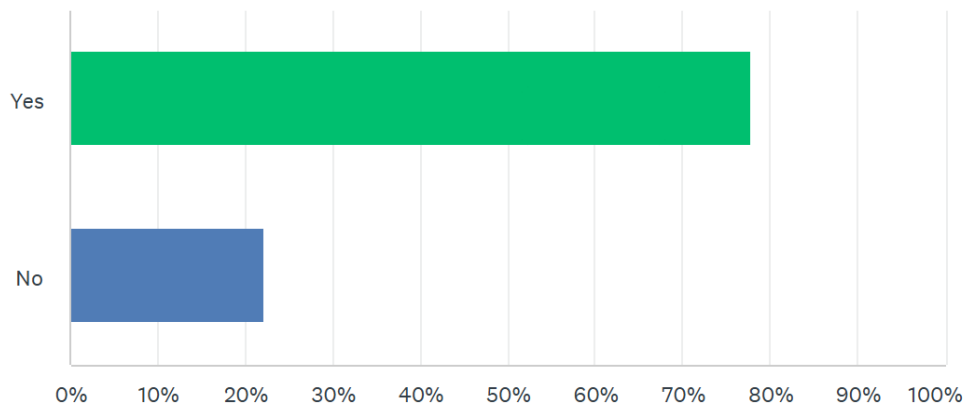
ANSWER CHOICES	RESPONSES	
Yes	100.00%	9
No	0.00%	0
TOTAL		9



Survey

2. Have you ever had any issues locating equipment for an emergent intubation?
 - a. Yes
 - b. No

Answered: 9 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	77.78%	7
No	22.22%	2
TOTAL		9

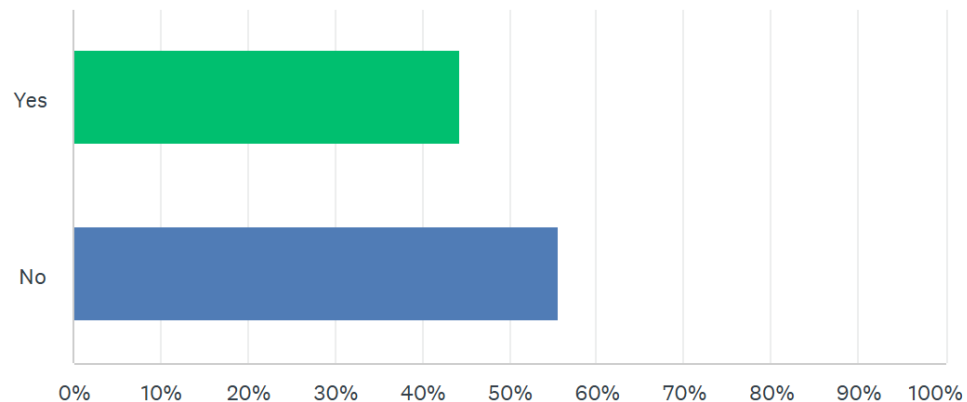


Survey

3. Are you aware of any supply issues that delayed an emergent intubation?
- a. Yes
 - b. No

Answered: 9 Skipped: 0

Are you aware of any supply issues that delayed an emergent intubation?



ANSWER CHOICES	RESPONSES	
Yes	44.44%	4
No	55.56%	5
TOTAL		9

Survey

4. How frequently have you experienced an equipment issue while preparing for or performing an emergent intubation?

1. never

2. sometimes

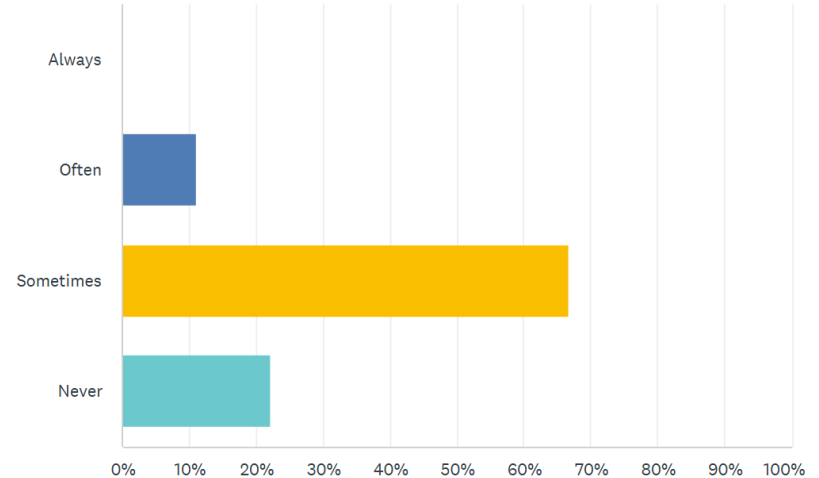
3. often

4. Always

Q4

How frequently have you experience an equipment issue while preparing for or performing an emergent intubation?

Answered: 9 Skipped: 0



ANSWER CHOICES	RESPONSES	
Always	0.00%	0
Often	11.11%	1
Sometimes	66.67%	6
Never	22.22%	2
TOTAL		9

Survey

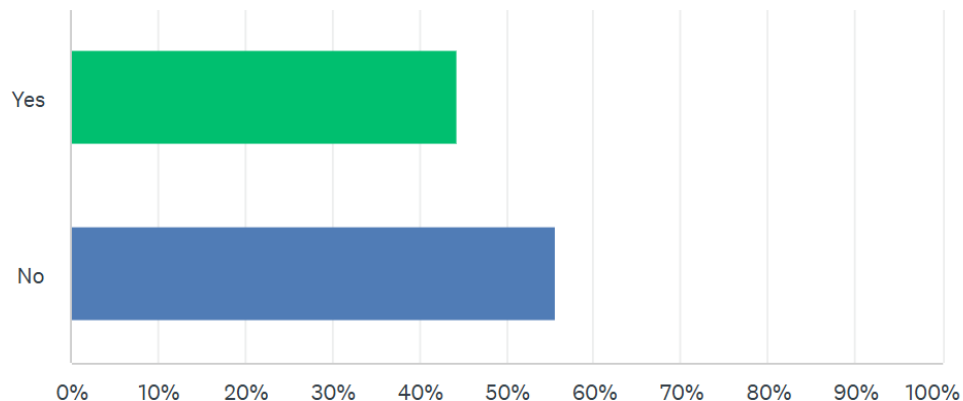
5. Have you ever noticed any evidence of potential patient harm from an equipment issue during an emergent intubation?
- a. Yes
 - a. No

Q5



Have you noticed any evidence of potential patient harm due to equipment issue during an emergent intubation?

Answered: 9 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	44.44%	4
No	55.56%	5
TOTAL		9

Changes Implemented

We collaborated, reviewed intubation boxes from other facilities, and researched current recommendations for emergent intubation supplies to compile our initial itemized list. After this, we sought out our collaborating attending physician for feedback and recommendations, and revised our initial list into this draft.

Adult Intubation Box	
Syringes	Quantity
60 mL syringe	1
10 mL syringe	5
5 mL syringe	1
3 mL syringe	1
Needles	
25 G	1
22 G	1
20 G	1
18 G	2
18 G blunt tip	1
14 G angiocath needle	1
Blades	
Miller 2	1
Macintosh 3	1
Macintosh 4	1
Hyperangulated	1
Oral airways	
70 mm	1
80 mm	1
90 mm	1
Nasal trumpets	
24 f	1
26 f	1
28 f	1
30 f	1
Cuffed ET	
6.5	1
7	1
7.5	1
8	1
8.5	1
9	1

LM airways	
LMA 3	1
LMA 4	1
LMA 5	1
Miscellaneous	
Blade handle	1
PEEP valve	1
10 mL NS flush	2
Shielded face mask	1
Lubricating jelly	3
Cloth tape	1
Tongue depressor	1
Scalpel #10	1
Stylet	1
ETT connector cap	1
McGill forceps	1
AmbuBag	1
ET holder	1
CO2 detector	1
Bougie	1

Adult Intubation Box: Broken Down

Syringes: A wide variety of syringes sizes are necessary to either inflate the ETT cuff, push meds, or flush. Multiple syringes were included to prevent delays or reuse during an emergency.

Needles: We included multiple needs of different size ranging from 25 G for ABG sampling or local anesthetic to 14 G in the case of an emergent cricothyrotomy.

Blades: A wide variety of blades were included to cater to the variety of body habitus, including the Macintosh 4 for larger adults and the hyperangulated blade for difficult airways. This multitude of choices is intended to reduce first-pass failure risk.

Oral Airways: Multiple oral airways of various sizes were included to prevent tongue obstruction, facilitate bag mask ventilation, and maintain airway patency.

Adult Intubation Box: Broken Down

Nasal trumpets: Included to allow for oxygenation without gag reflex or in the case of a contraindicated or poorly tolerated oral airway.

Cuffed ET: A variety of sizes were included to cover the majority of adult anatomy.

LM Airways: Included as a rescue when intubation fails. Allows rapid oxygenation without visualization.

Adult Intubation Box: Broken Down

Miscellaneous:

This was a catch-all category for items that would facilitate a faster intubation. This ranges from the AmbuBag for oxygenation before ventilation to the CO2 detector to confirm successful ventilation.

The rationale behind included items such as lubricating jelly or cloth tape is to save seconds during critical care time that would be wasted looking for the item.

Pediatric Intubation Box	
Syringes	Quantity
60 mL syringe	1
10 mL syringe	5
5 mL syringe	1
3 mL syringe	1
Needles	
25 G	1
22 G	1
20 G	1
18 G	2
18 G blunt tip	1
14 G angiocath needle	1
Blades	
00 Miller	1
0 Miller	
1.0 Miller	1
2.0 Miller	1
1.0 Macintosh	1
2.0 Macintosh	1
Oral airways	
30 mm	1
40 mm	1
50 mm	1
60 mm	1
Nasal trumpets	
6 f	1
12 f	1
14 f	1
16 f	1
18 f	1
20 f	1
Cuffed ET	
2.5	1
3	1
3.5	1
4	1
4.5	1
5	1
5.5	1

LM airways	Quantity
Peds 1.0	1
Peds 1.5	1
Peds 2	1
Peds 3	1
Peds 4	1
Face mask	
Neonate 00	1
Infant 2	1
Child 3	1
Child 4	1
Miscellaneous	
Blade handle	1
PEEP valve	1
10 mL NS flush	2
Shielded face mask	1
Lubricating jelly	3
Cloth tape	1
Tongue depressor	1
Scalpel #10	1
Stylet	1
Neonatal stylet	1
ETT connector cap	1
Pediatric McGill forceps	1
500ml anesthesia bag	1
ET holder	1
CO2 detector	1
Bougie	1
Yankauer suction	1

Pediatric Intubation Box: Broken Down

Syringes and Needles were unchanged between boxes. Rationale remains the same for pediatrics.

Blades: Sizes range from 00 Miller to 2.0 Macintosh, aiming to cover all pediatric body types; furthermore, both Miller and Macintosh are included for as airway variation may require a different shaped blade.

Oral airways: Sizes range from 30 mm to 60 mm, chosen for pediatric sizing. Rationale otherwise unchanged.

Nasal trumpets: Sizes range from 6 f to 20 f, chosen for pediatric sizing. Rationale otherwise unchanged.

Pediatric Intubation Box: Broken Down

Cuffed ET: A variety of sizes ranging from 2.5 to 5.5 were chosen to fit pediatric anatomy.

LM airways: A variety of sizes ranging from Peds 1.0 to Peds 4 were chosen to fit pediatric anatomy; otherwise, rationale remains unchanged.

Face mask: It is crucial to have a good seal to adequately provide oxygen. A variety of sizes ranging from Neonate 00 to Child 4 were chosen to fit pediatric anatomy.

Miscellaneous: Largely unchanged from the adult box, but there were several additions. A neonate stylet and 500 mL anesthesia were added to fit pediatric anatomy. Pediatric McGill forceps were added in case of a foreign body blocking the airway.

Planned changes

- Implementation of intubation box
- Repeat survey

Repeat Survey Plans

We will repeat the survey in May 2026 and analyze any trends in the question responses after the standardized airboxes have been regularly stocked and organized for three months.

What improvements we hope to see:

- Reduction or elimination of supply issues leading to delayed intubations.
- Reduction in difficulty of locating supplies during intubations.
- Reduction in equipment issues during intubations.
- Reduction or elimination of patient harm from delayed intubations.

Conclusion

- We, through surveys, have identified the possibility for improvement involving intubations, both from a patient care and staff utility standpoint.
- We have collaborated with staff to identify an effective and possible way to reduce or eliminate this.
- We have researched and compiled a list of supplies which will facilitate this goal.
- We have presented this list for consideration.
- We will repeat a survey to evaluate the effectiveness of the proposed list.

Reference

Piechowski W, Clapper TC, Park JC, Ching K, St George J. A prospective randomised simulation trial comparing our novel AIR-BOX to standard airway equipment storage modalities. *BMJ Simul Technol Enhanc Learn*. 2020 Oct 28;7(5):311-318. doi: 10.1136/bmjstel-2020-000721. PMID: 35515731; PMCID: PMC8936580.
<https://pmc.ncbi.nlm.nih.gov/articles/PMC8936580/>