

With a Little Help From My Friends, Part 2

Planning and Teamwork
For Successful Management of Difficult Airways
in the NICU

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The Nightmare Scenario – ENT Perspective



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But Seriously, folks...

- The above scenario is (thankfully) exaggerated and rare. And sometimes a surprise difficult airway can't be predicted or avoided. But often it can be (and is)!
- You probably already know most of what I'm going to say. If there are 2-3 new pieces of information for you, I've done my job.

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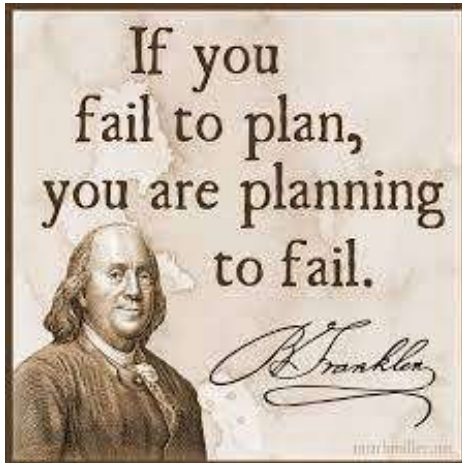
Adverse Events associated with DAI in NICU

- 44% AE rate
 - vs. 14% for non-DAI – Odds Ratio: 5!
- 13% had a severe AE (vs. 3% non-DAI)
- 75% of DAI patients experienced severe desaturation during intubation!
 - Classified as decrease in SpO₂ of >20%

Sawyer T, et al. Arch Dis Child Fetal Neonatal Ed 2019;104:F461–F466

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PLAN AHEAD



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PLAN AHEAD – ASK YOURSELF:

- What about my patient might lead to a need to intubate? How will I see that coming?
 - You all know more about this one than I do!
- Are there any signs this patient could be a difficult intubation?
- What temporizing measures might be useful?
- What help might I need?

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Can We Predict DAI in NICU? Sort of.

Traditional Indicators of potential DAI*:

- Micrognathia/Cleft Palate
 - Short thyromental distance
- Other upper airway obstruction (macroglossia, etc.)
- Limited Oral Opening / Small Mouth
- Limited Neck Extension
- Known history of prior DAI

*All found to be more common in DAI but relatively poor predictors of DAI in NICU (none with PPV>32%).

Other Possible Predictors:

- Tiny baby/preemie
 - EGA<32 weeks at birth
 - Birth weight <1000g
 - Weight <1500g at time of intubation
 - Intubation for surfactant

Not predictive in this study:

- Sex
- Cardiac/pulmonary or neuro comorbidity
- Midface hypoplasia or other craniofacial anomaly

Sawyer T, et al.

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What help might be needed?

- Respiratory Therapy
 - See: Scott May's lecture
- Anesthesia or ENT
 - Help formulate airway plan
 - Potentially add to hospital difficult airway registry

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Difficult Airway Registry – Bedside Sign

DIFFICULT AIRWAY



In the event of respiratory distress or failure:

- Immediately call for help (Code Blue) and page Anesthesia (816) 458-6044.
- Bag-mask ventilate the patient until expert help arrives.
 - ◊ Consider use of oral/nasal airway if needed.
- DO NOT paralyze the patient.
- If clinical deterioration, a laryngeal mask airway(LMA) may be placed.
- For endotracheal intubation; use of a C-Mac, Glidescope or flexible fiberoptic bronchoscope by an expert provider is essential.



ORAL AIRWAY SIZE: _____

NP AIRWAY SIZE: _____

LMA SIZE: _____



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Difficult Airway Bedside Sign, cont'd.

Guide to airway adjunct sizing

NP AIRWAY

Pt. Age/Weight	Newborn	0-6 mo.	6-12 mo.	12 mo. - 1 yr.	1-6 mo.	6 mo. - 1 yr.
Size	12 fr	14 fr	16 fr	18 fr	20 fr	22 fr
Pt. Age/Weight	1-2 yr.	2-4 yr.	4-6 yr.	6-8 yr.	8-10 yr.	10 yr. or >
Size	24 fr	26 fr	28 fr	30 fr	32 fr	34 fr

ORAL AIRWAY

Pt. Age/Weight	Infant 3-5 kg	Infant 6-9 kg	Child 10-18 kg	Child 19-23 kg	Lg. Child 24-29 kg	Adult or >29 kg	Large Adult
Size	40 mm	50 mm	60 mm	70 mm	80 mm	90 mm	100 mm

LMA TUBES

Pt. Age/Weight	Neonates & infants up to 5kg	Infants 5-10 kg	Infants & children up to 20 kg	Child 20-30 kg	Child & small adult 30-50 kg	Adult 50-70 kg	Adult 70 kg and up
Size	1	1.5	2	2.5	3	4	5



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What ENT Can Do

- Help Form Plan – what does this intubation need to look like?
 - Go ahead, you should be fine. Consider XYZ.
 - Go ahead, but we'll put our toys at bedside just in case
- Help with the Extubation
 - ENT-attended extubation
 - OR for laryngoscopy/bronchoscopy +/- trial extubation (if intubated)

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Laryngoscopy & Bronchoscopy

- We're good at laryngoscopy, but we actually do it *less* than the anesthesiologists.

BUT we have the BEST TOOLS.



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Laryngoscopy & Bronchoscopy

- Laryngoscope – LOTS of Light!
 - Parsons or Benjamin
 - Slotted
 - Allows suspension – surgical intervention
 - Anterior Commissure / Holinger
 - Shaped to maximize view of vocal cords in difficult airway, technically difficult to use
- Bronchoscope
 - Ventilating bronch
 - Telescope to guide ETT

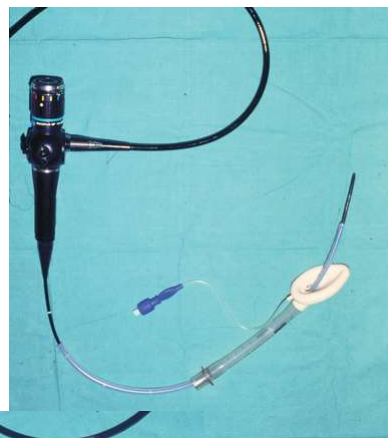


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Fiberoptic Intubation

- Fiberoptic endoscopes can be used in a variety of combinations to facilitate intubation
 - With just ETT
 - With LMA +/- guidewire &/or exchange catheter
 - With videolaryngoscope
 - ETC.



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What if YOU have to intubate a DAI patient?

- TAKE A DEEP BREATH
- Optimize the patient
 - 100% FiO₂
 - Comfortable anesthetic level
 - Generally recommend NOT paralyzing if ability to bag mask is uncertain
 - Focus first on good mask ventilation
 - Oral airway, nasal trumpet, two-person masking, LMA, etc.
- This is not an intubation for a novice!
 - More on that in a minute...

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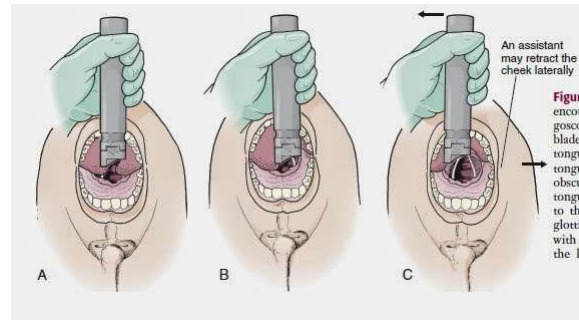
It's Go time...

- Get your equipment ready BEFOREHAND
 - Check that everything works
 - light/power on your laryngoscope
 - Consider videolaryngoscope - C-Mac/Glidescope
 - Look at the PATIENT NOT THE MONITOR until you see the epiglottis or arrive where you'd expect to start seeing it
 - Stylet – I say yes.
 - Start with a gentle bend at the tip, adjust as needed.
 - May need more bend for really difficult airways, especially with videolaryngoscope
 - Once ET tube tip is in the trachea, take the stylet out before advancing!
Advance under direct visualization

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It's Go time, contd... Optimal Technique

- Enter in “the gutter”.
- Be **DELIBERATE BUT GENTLE** as the laryngoscope is inserted
- **CRICOID PRESSURE** is essential in difficult airways.
 - *Do it yourself* till you find the airway
- Avoid a “jabbing” motion with the ET tube, or repeated blind attempts.
- Try for max 30 sec at a time (or SpO2 <90%), then stop and regroup
- Keep laryngoscope in place, with view maximized while you confirm location



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Who should intubate this patient?

- This is a delicate topic
 - Patient Care vs. Education
- Only an experienced laryngoscopist should attempt a known or suspected difficult intubation
 - Discuss beforehand with team when possible
- Remember, 75% of DAIs experience \downarrow SpO2 $\geq 20\%$ and 44% experience an adverse event



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What about NICU fellows?

- DEPENDS
 - Experience of the fellow
 - *How* difficult is it going to be?
- Fellows participated in 50% of DAIs vs 27% of non-DAIs
 - Correlation is NOT causation. And the fellow is there for THESE experiences. But remember...
- The first look is the best look
 - Trauma makes subsequent attempts MUCH more difficult – no blind jabs!

Provider and practice characteristic	Non-difficult intubation (n=1733)	Difficult intubation (n=276)	P value
First intubator			
Neonatology fellow, n (%)	474 (27)	135 (49)	<.001
Nurse practitioner/physician assistant/hospitalist	698 (40)	67 (24)	
Paediatric resident	266 (15)	34 (12)	
Neonatology attending	122 (7)	18 (6)	
Respiratory therapist	44 (3)	0 (0)	
Other	129 (7)	22 (8)	

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My Recommendation

- Know the trainee's skill level
 - They need to be REALLY proficient at straightforward intubations first
 - Consider a "check-off" process
 - If you don't know, the answer is no.
- Review proper technique beforehand
 - Gutter, sweep the tongue, GENTLE insertion, cricoid pressure, etc.
- Only 1 or 2 tries, no more than 30 sec or SpO2 90%, whichever comes first
- Then most-skilled available provider tries



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Take-Homes

- Difficult Airway Intubations are common in the NICU setting, and frequently result in adverse events
- Planning is Critical
 - Line up temporizing measures
 - Place consults ahead of time, if appropriate
 - Anesthesia/ENT can help - you don't have to go it alone!
 - Difficult Airway registry (if available/applicable)
- Proper Technique
 - Sweep the entire tongue left, cricoid pressure, don't jab.
- Don't Try Too Many Times or For Too Long. Try Something Else!
- Be cautious and mindful about involvement of trainees/inexperienced providers

Thanks for your attention!

Feel free to reach out:
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