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
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.

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%

PLAN AHEAD

If you fail to plan, you are planning to fail.

IF YOU FAIL TO PLAN, YOU PLAN TO FAIL
FALSE.
YOU FAILED TO PLAN, THEREFORE YOU DID NOT PLAN TO FAIL.

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?
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.

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
Difficult Airway Registry – Bedside Sign

**DIFFICULT AIRWAY**

In the event of respiratory distress or failure:
- Immediately call for help (Code Blue) and page Anesthesiology (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.

**NP AIRWAY**

<table>
<thead>
<tr>
<th>Pt. Age/Weight</th>
<th>Newborn</th>
<th>0-6 mo.</th>
<th>6-12 mo.</th>
<th>12 mo. - 1 yr.</th>
<th>1-6 yr.</th>
<th>6 yr. - 1 yr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>12 fr</td>
<td>14 fr</td>
<td>16 fr</td>
<td>18 fr</td>
<td>20 fr</td>
<td>22 fr</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pt. Age/Weight</th>
<th>1-2 yr.</th>
<th>2-4 yr.</th>
<th>4-6 yr.</th>
<th>6-8 yr.</th>
<th>8-10 yr.</th>
<th>10 yr. or +</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>24 fr</td>
<td>26 fr</td>
<td>28 fr</td>
<td>30 fr</td>
<td>32 fr</td>
<td>34 fr</td>
</tr>
</tbody>
</table>

**ORAL AIRWAY**

<table>
<thead>
<tr>
<th>Pt. Age/Weight</th>
<th>Infant 3-5 kg</th>
<th>Infant 6-9 kg</th>
<th>Child 10-18 kg</th>
<th>Child 19-23 kg</th>
<th>Lg. Child 24-29 kg</th>
<th>Adult or &gt;29 kg</th>
<th>Large Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>40 mm</td>
<td>50 mm</td>
<td>60 mm</td>
<td>70 mm</td>
<td>80 mm</td>
<td>90 mm</td>
<td>100 mm</td>
</tr>
</tbody>
</table>

**LMA TUBES**

<table>
<thead>
<tr>
<th>Pt. Age/Weight</th>
<th>Neonates &amp; infants up to 5 kg</th>
<th>Infants 5-10 kg</th>
<th>Infants &amp; children up to 20 kg</th>
<th>Child 20-30 kg</th>
<th>Child &amp; small adult 30-50 kg</th>
<th>Adult 50-70 kg</th>
<th>Adult 70 kg and up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>1</td>
<td>1.5</td>
<td>2</td>
<td>2.5</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Guide to airway adjunct sizing
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)

Laryngoscopy & Bronchoscopy

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

  BUT we have the BEST TOOLS.
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

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.
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…

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
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

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 ↓ SpO2 ≥20% and 44% experience an adverse event
What about NICU fellows?

• DEPENDS
  • Experience of the fellow
  • How difficult is it going to be?
• Fellows participated in 50% of DAIIs vs 27% of non-DAIIs
  • 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!


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
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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