Airway Management in Critically Ill COVID-19 Patients

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Disclosures

- (none)

Outline

- Staff safety
  - PPE
- Patient factors/ timing
- Adjuncts for oxygenation
- Intubation procedure
  - Preparation
  - Equipment/technique
  - Unusual situations
    - Difficult airways
    - Tracheostomy
    - Emergencies

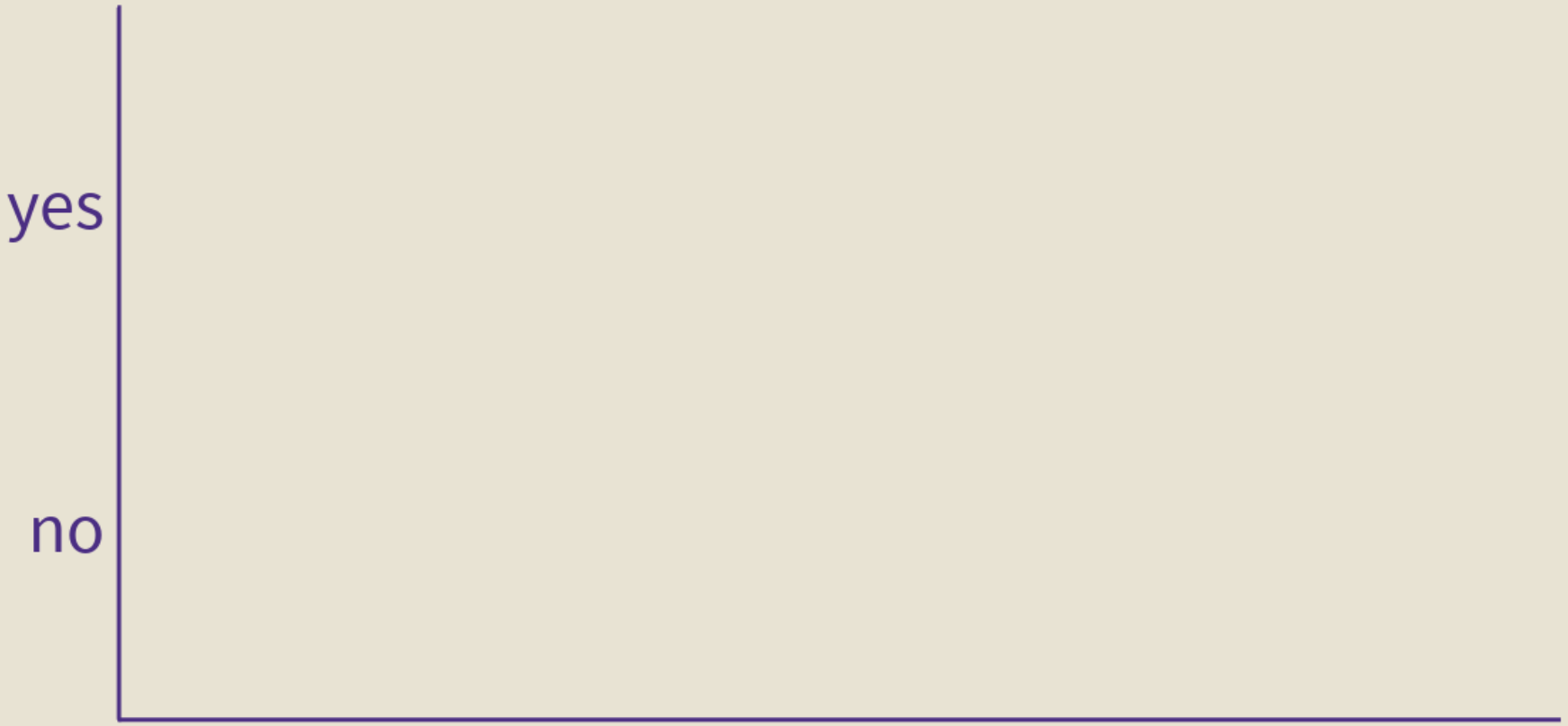
Opening Questions

- Please navigate to
  - pollev.com/katherinehel603

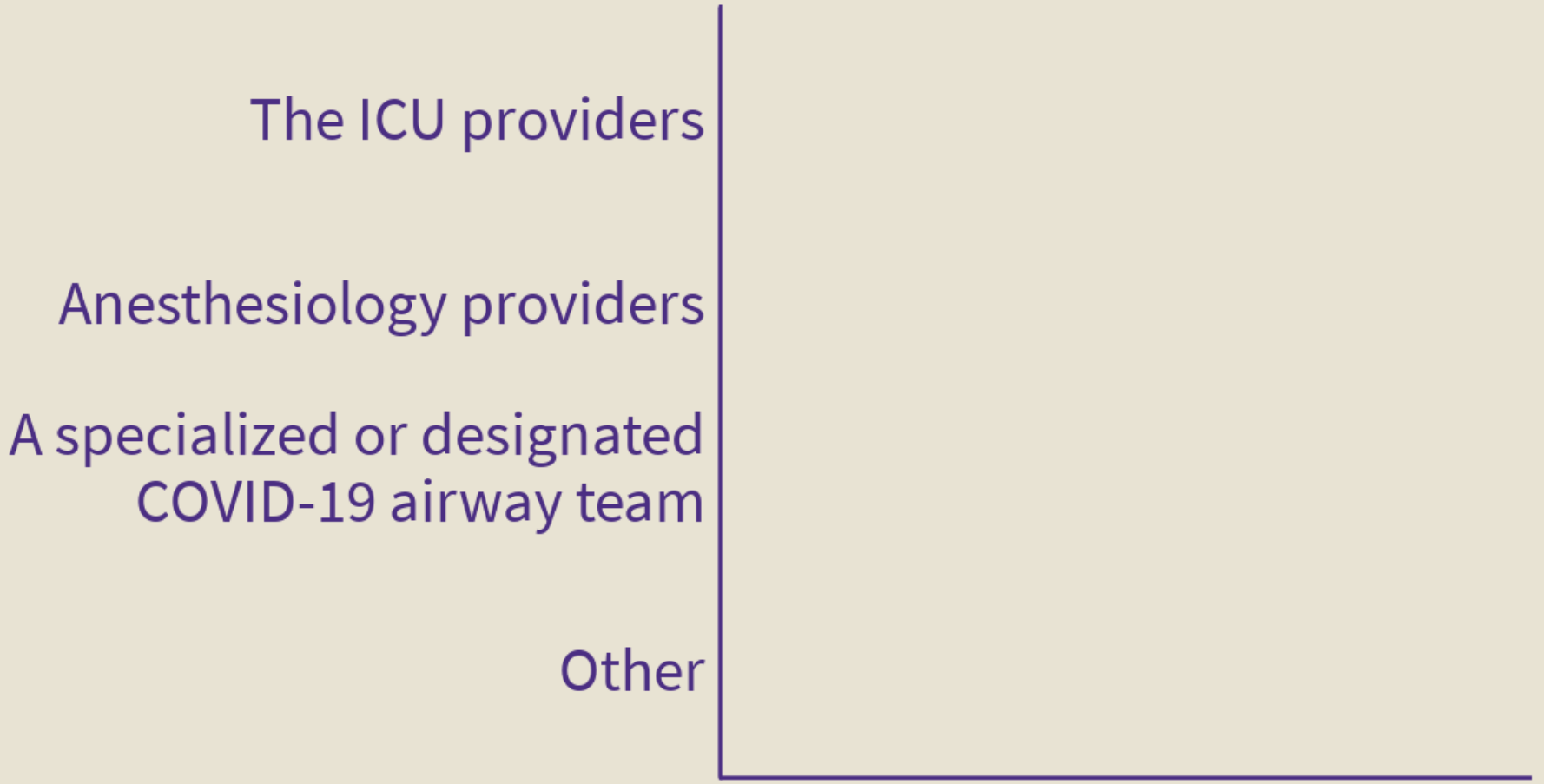
I have been or will be responsible for the airway management of known or suspected COVID-19 positive patients

- yes
- no

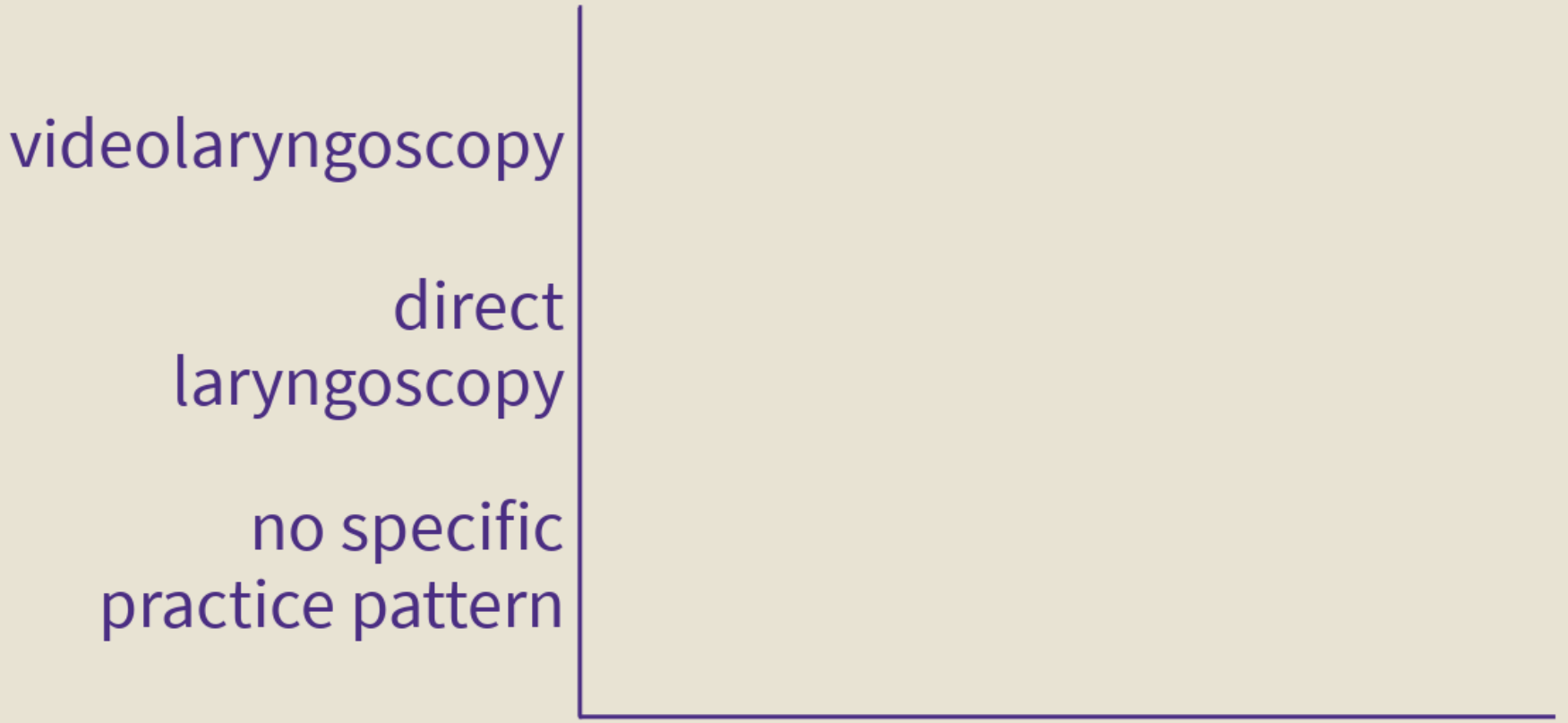
W I have been or will be responsible for the airway management of known or suspected COVID-19 positive patients



At my institution, known or suspected COVID-19 positive intubations are performed by:



At my institution, most known or suspected COVID-19 positive intubations are performed with:



Priorities

- Priority #1: Staff Safety

Considerations for Staff

- Procedural planning
  - Appropriate PPE takes time
    - Avoid emergencies when able
    - **Consider rounding (remotely?) on known COVID patients**

PPE

- Any airway management is an Aerosol Generating Procedure (AGP)
  - Need respirator level protections
  - airborne + contact/droplet

N95 vs PAPR

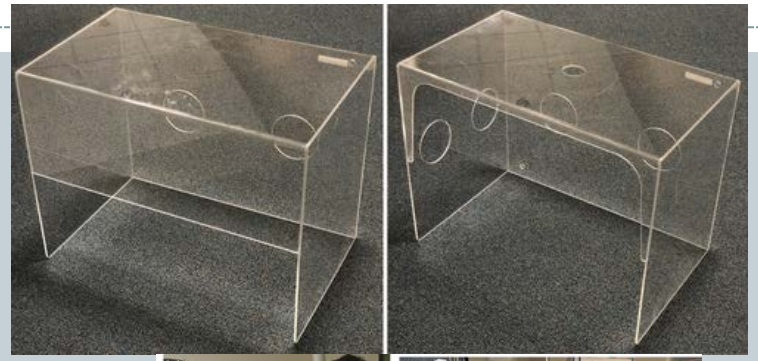
- N95
  - Pro
    - Easy to don
    - Fast
    - Allow use of stethoscope
    - More readily available
  - Con
    - Allows contamination of face and neck
    - Less comfortable
    - May not fit everyone
    - Fit can change
- PAPR
  - Pro
    - Comfortable
    - Protect face, neck, head
    - Reusable
  - Con
    - Require power source
    - Need assistance to don and doff
    - Noisy

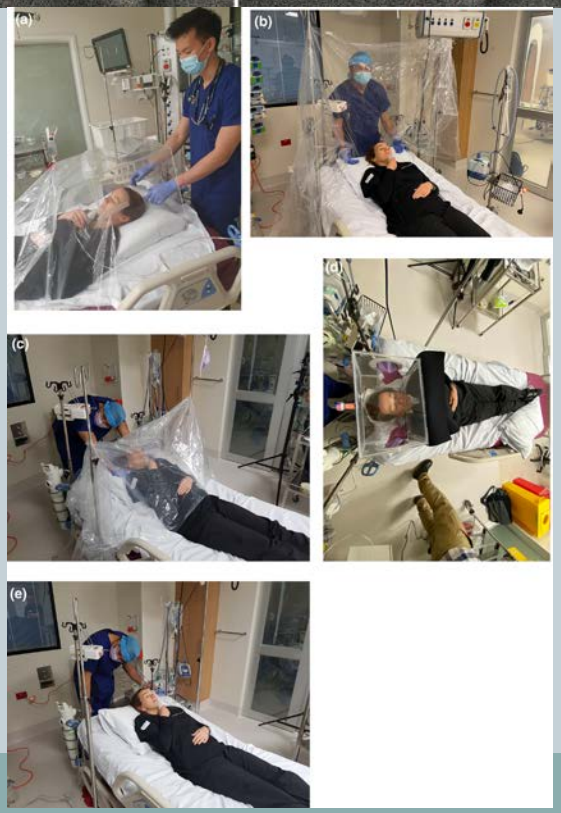
Infection Control

- Choose what work for you and your institution
- More important to have clear protocols and expectations
- Minimize in room staff
- Have equipment easily available
- Filter in line on circuit

Infection control

- Barrier Devices
  - Not recommended
  - Additional encumbrance to intubation without proven benefit
    - Not a replacement for PPE
  - May actually increase risk [11]
    - Failed airway
    - Breach of PPE
  - FDA revoked EUA for barrier devices in 8/2020





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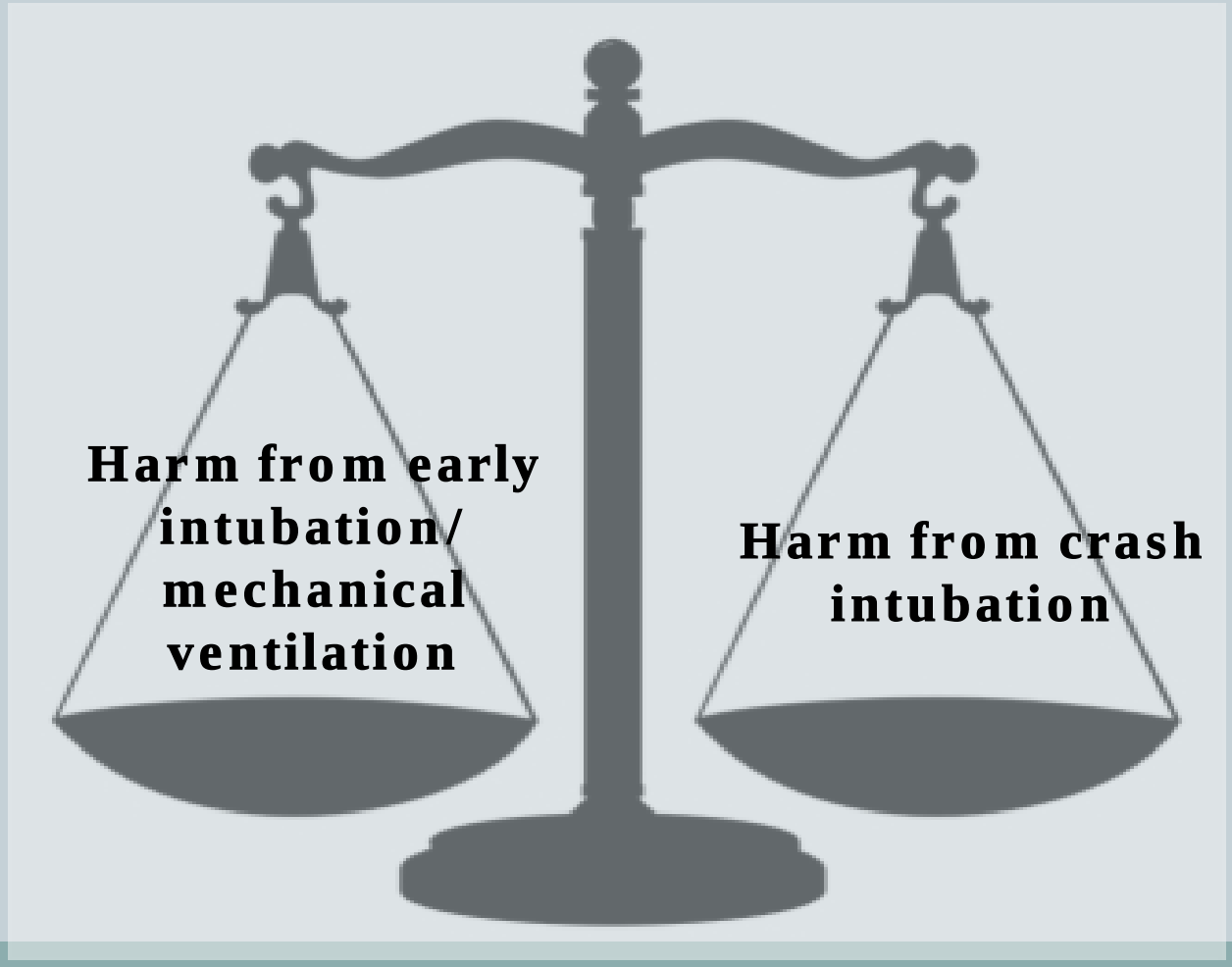
Priorities

- Priority #2: Getting patient oxygen

When to Intubate



Considerations for the Patient

- Early studies in NY showed higher mortality with later intubation
  - Almost 70% mortality in mechanically ventilated patients overall
- More recently, no difference in mortality with later intubation
  - one review of 230 ICU patient with COVID-19 ARDS [2]
    - 75% required mechanical ventilation
    - 109 received HFNC initially
      - 71.6% of HFNC patients progressed to intubation
    - Time between ICU admit and intubation did not correlate to mortality
    - HFNC did not correlate with increased mortality
  - Overall mortality ~30%
  - Additional reviews also show no association between timing of intubation and mortality [3,4]

High flow and BiPAP

- What to do?
  - Evidence is lacking
- Most larger institutions have moved to using HFNC and BiPAP in selected cases
  - Ideally should occur in a negative pressure room
- If they are already in use : continue!

What do we know?

- Hypoxemia extremely common during intubation
  - >70% in one study [6]
- Apneic oxygenation acceptable
  - Consider bag-mask ventilation?
- Speed matters
- RSI currently recommended by most major societies
  - Do what makes sense in the clinical situation

Priorities

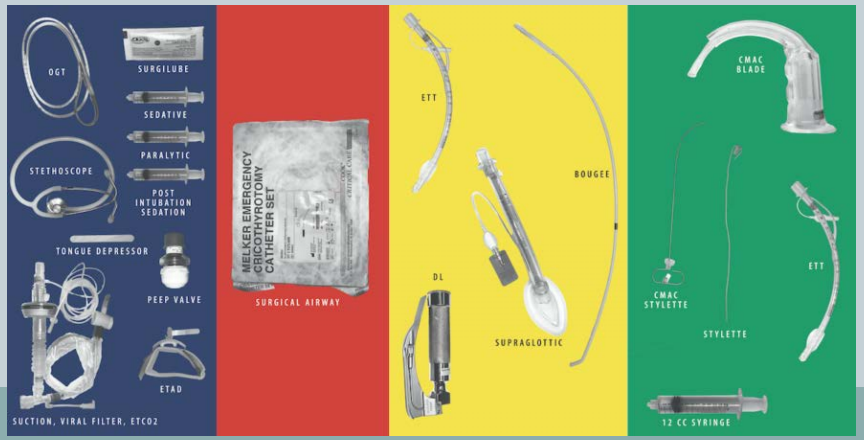
- Priority #3: have a plan (and a backup plan)

Intubation Preparation

- Don’t forget the basics
  - Good IV access, free flowing IV
    - Sedative and vasopressor drips available
  - Suction
  - Standard monitors
    - ECG
    - BP cuff cycling q3-5min
    - Pulse ox (audible)
  - ETCO2
- Checklist

Intubation Preparation

- Equipment
  - Videolaryngoscope may aid in:
    - First pass success
    - Maintaining some degree of physical distance
- Operator
  - Able to function independently or with minimal assistance
  - Consider intubation/drug "packs"
    - Equipment tray
    - Drug tray
    -

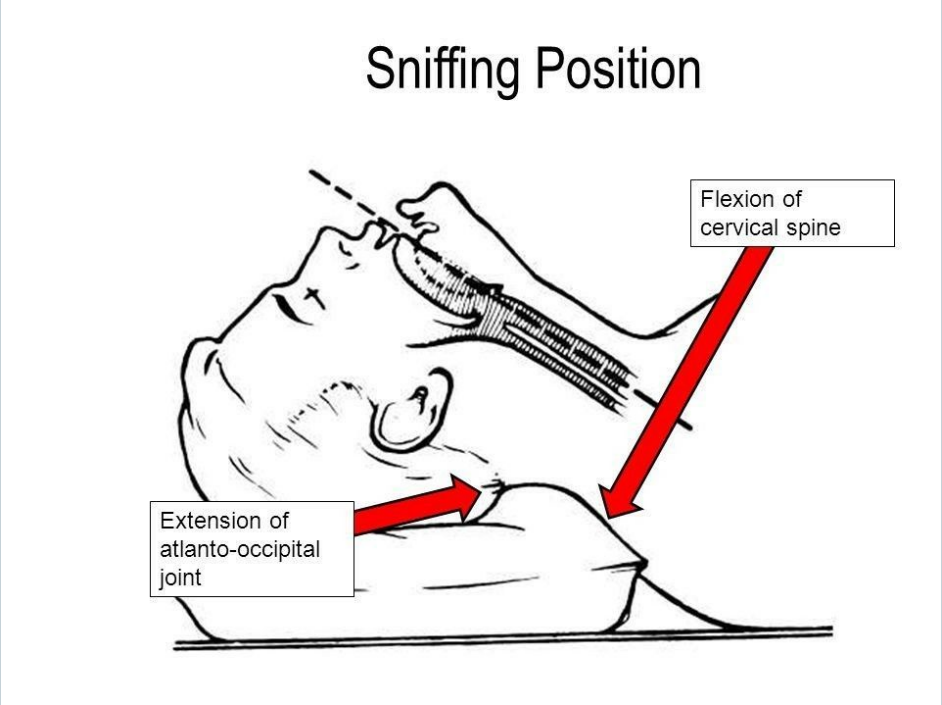


Intubation Preparation

- Assign Roles
- Backup Plan
  - The more difficult the airway, the more equipment gets opened
  - Trying to minimize apneic time whenever possible

Tips

- Focus on pre-induction positioning
  - “sniffing position”
    - Folded blankets > pillows
  - Ramp or reverse trendelenburg for obese patients



https://www.imedpub.com/articles/sniffing-position-is-it-just-a-gas.php?aid=23442

Intubation Procedure

- Induction
  - Drug selection
    - Etomidate vs propofol vs ketamine
      - If using propofol, dramatically reduce dose
    - Rocuronium vs succinylcholine
      - Have long acting neuromuscular blockade available in either case
- Consider bundling care
  - Place lines
  - Proning?

Complications

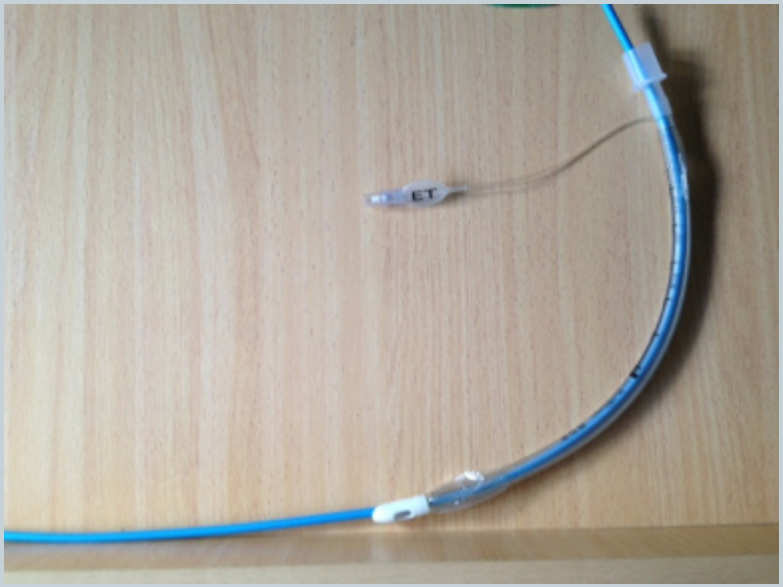
- Hypoxemia
- Hypotension
- Pneumothorax/pneumomediastinum
  - Consider POCUS
- Cardiac arrest
- Worsening VQ match
  - Need for paralysis and proning

Difficult Airways

- Adjust preparation based on perceived difficulty
  - Anesthetic/airway history
  - Mallampati score
  - Hx OSA
  - Thyromental distance
  - Mouth opening
- Fiberoptic generally not recommended
- Tracheostomy is possible
  - Protocols available
  - Treat as a COVID-19 (+) OR case

Adjuncts

- Bougie with preloaded ET tube
  - Pro: may increase first pass success
  - Con: may require assistance from second operator
- LMA
  - Pro: may improve seal if mask ventilation proves necessary
  - Con: likely aerosol generating, not a definitive secured airway



Summary

- Staff Safety
  - Reasonable body of evidence that intubation can be safe with sufficient PPE and clear donning/doffing protocols
  - Slight preference for PAPR, but use what works for your facility
- Preparation
  - Minimize in room personnel
  - Amount of open/available equipment should scale to perceive airway difficulty
    - Be able to move quickly through alternate plans
    - Prioritize oxygenation
  - Focus on positioning
  - Consider drug and equipment “packs” to shorten set up time
- NIV
  - Prelim data on patients using HFNC or BiPAP shows 60-70% progress to mechanical ventilation [2-4,12]

Summary

- Intubation procedure
  - RSI
  - Consider VL
  - Expect hypoxemia and hypotension
- Difficult Airways
  - Assess in advance
  - **Greater perceived difficulty --> earlier intubation**
    - Involve your local experts in planning
  - Consider adjuncts and tracheostomy in emergencies

Questions?

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