Extubation in the Emergency Department

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Who gets extubated in the ED?

‘once the underlying process that necessitated mechanical ventilation is resolved, SBT and weaning should start’ - ACCCM

Good candidate

- EtOH, no longer intoxicated
- Negative trauma workups
- Agitation d/t substance
- ?carbon monoxide poisoning?

Bad candidate

- EtOH, still heavily intoxicated
- Trauma workup with ICH or requiring surgery
- Airway swelling (inhalation injury, anaphylaxis)
- Processes requiring days to improve (PNA, CHF, COPD)
- On vasopressors

Spontaneous Awakening Trial

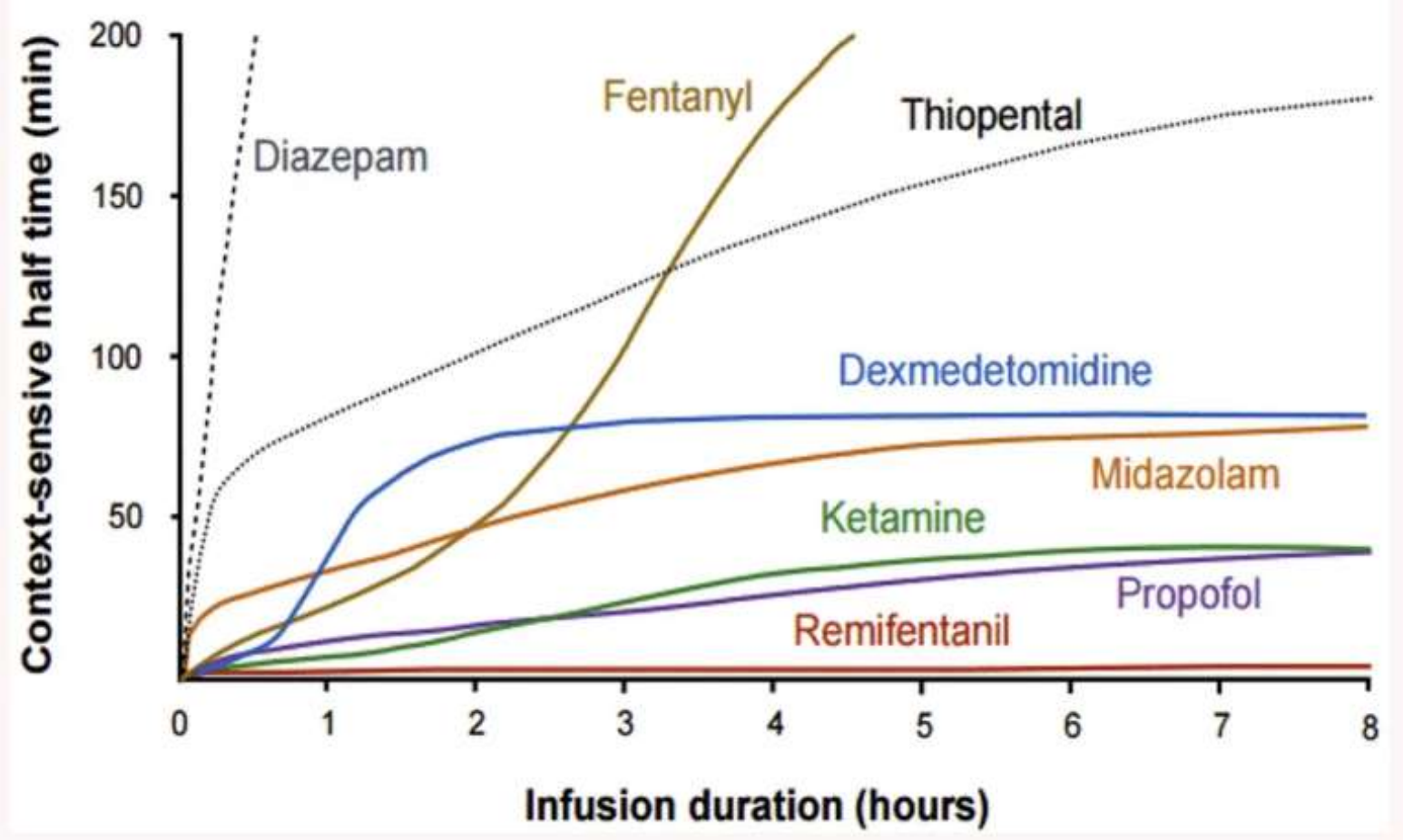
- Assess at 4 hours off sedatives (analgesics may be continued)
- Patient may waken well before 4 hours depending on agent

Present:

- Open eyes
- Look at caregiver
- Squeeze hand
- Hold arm in air
- Raise head off bed

Not present:

- Sustained anxiety/ agitation
- RR >/=35 (28) for 5 minutes
- SpO2 < 88% (92) for 5 minutes
- Signs of resp distress
  - Dyspnea
  - Tachycardia / bradycardia
  - Use of accessory muscles


Context-sensitive half time (min)
200
150
100
50
0
1
2
3
4
5
6
7
8
Infusion duration (hours)
Diazepam
Fentanyl
Thiopental
Dexmedetomidine
Midazolam
Ketamine
Propofol
Remifentanil

Spontaneous Breathing Trial

- Ventilatory support removed x 15-30 min
  - Ventilator set to 'flow-by' with PEEP 5
  - T-piece SBT on pressure support ventilation

- Failed SBT:
  - RR < 8 bpm or > 30
  - HR > 140 (some criteria say 120 or 100)
  - Tv >/= 6 ml/kg
  - Hypoxemia (SpO2 < 88% (92%) for > 5 min
  - Change in mental status
  - Cardiac arrhythmia
  - Anxiety / agitation / discomfort
  - Signs of resp distress (same as SAT)

Pressure support ventilation (PSV) is a patient triggered pressure limited mode which provides just enough pressure support to overcome the dead space of the ET tube.
Initial settings:

- Inspiratory pressure 5-8
- PEEP 5
- FiO2 < / = 40%

Rapid Shallow Breathing Index

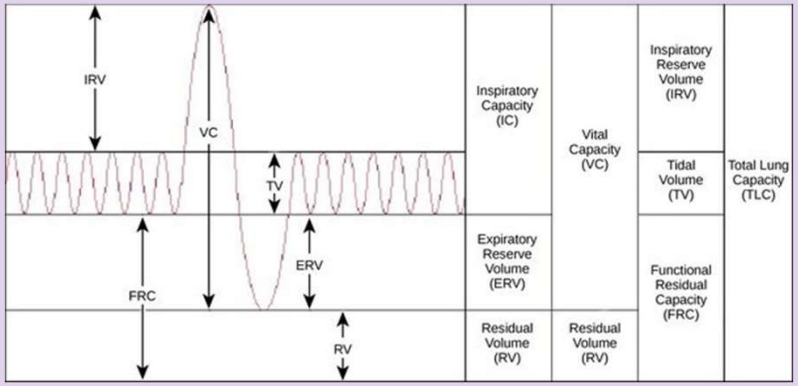
= RR / TV (min/**L**)

Rapid shallow breathing index = RR/TV

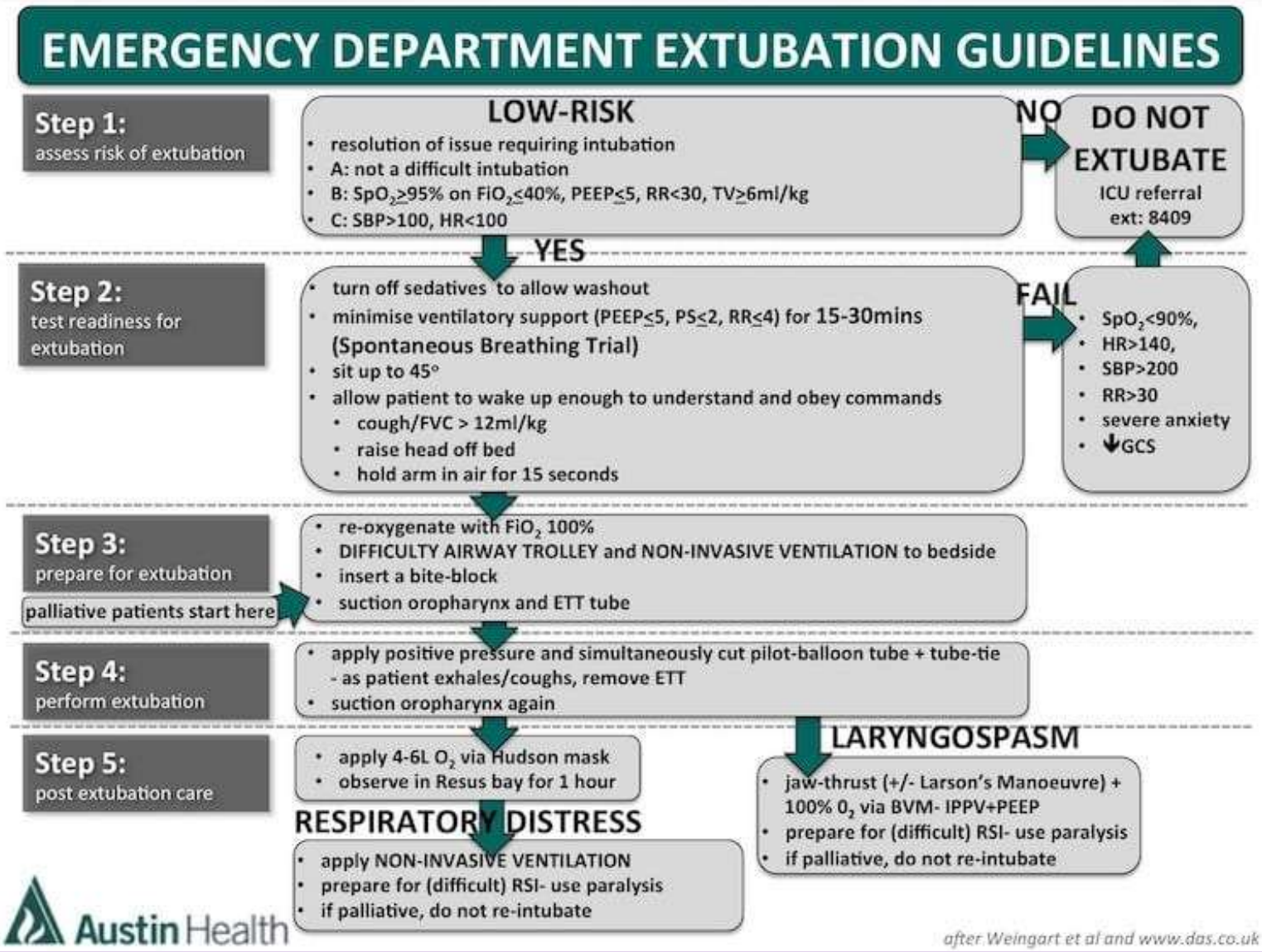
- Most consistent predictor of failed extubation

- >/= 105 is BAD : 95% chance of failed extubation

- E.g. : A 70 kg male is breathing at 32 bpm with a TV of 420 mL
- 420/1000 = 0.42
- 32/0.42 = 76 = good 2 go!



EMERGENCY DEPARTMENT EXTUBATION GUIDELINES



Post extubation stridor

- HR 100s RR 20s SpO2 100%
- 3-30% of extubations
- Risk factors:
  - Female, children, short necks, tracheomalacia
  - Traumatic intubations, multiple attempts, large ET size
  - Prolonged intubations (>36 hrs)
- Treated with nebulized epinephrine
- Post-extubation stridor • LITFL Medical Blog • CCC Airway

Cuff leak test (quantitative)

1) Set ventilator to volume control / assist control
2) Record expiratory TVs with cuff inflated (X)
3) Deflate cuff
4) Record expiratory TVs (Y) with cuff deflated, average three lowest values
5) X – Y = cuff leak volume
6) If cuff leak volume > 110 mL (or 25%), concern for post-extubation stridor

- Increased exhaled volume after cuff deflation is evidence for obstruction
- Qualitative assessment by listening over trachea
- Consider pretreatment with steroids or delaying extubation
- Remember: prediction of post-extubation stridor is not a contraindication to extubation