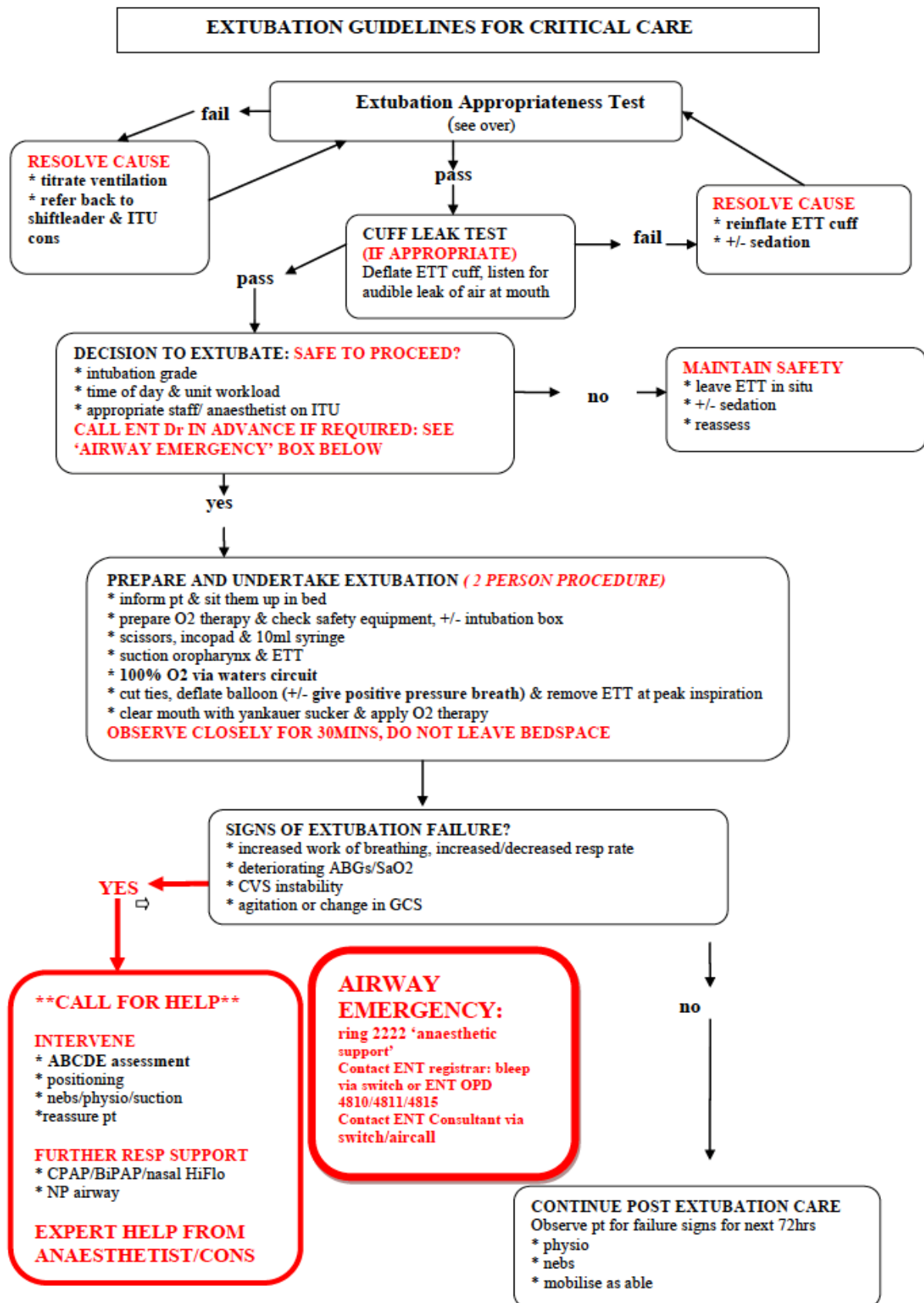


Extubation Guidelines



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EXTUBATION APPROPRIATENESS TEST

NB: this does NOT replace the clinical decision of the ITU Consultant

HAS THE ACUTE CAUSE LEADING TO INTUBATION BEEN RESOLVED?

AIRWAY:

- NO SIGNIFICANT AIRWAY/FACIAL/NECK SWELLING
- NO ACUTE CONCERN THAT PATIENT WOULD FAIL TO MAINTAIN OWN AIRWAY
- HAS PATIENT EXPERIENCED EXTUBATION FAILURE WITHIN LAST 72HRS?
- **WAS THE PATIENT A DIFFICULT INTUBATION (ie: INTUBATION GRADE > GRADE 2)?**

BREATHING:

- $SaO_2 \geq 92\%$ on $FIO_2 \leq 0.4$
- $PEEP \leq 5$ cms
- RESPIRATORY RATE ≤ 35 per min
- TIDAL VOLUME (V_t) ≥ 5 mls/kg
- RAPID SHALLOW BREATHING INDEX (RSBi) < 105 (observe patient for 1minute: divide resp rate by average tidal volume in litres ie: $20\text{bpm} / 0.250\text{l} = \text{RSBi } 80$)
- $PaO_2/PaCO_2$ within acceptable limits for patient
- No significant respiratory acidosis
- No excessive sputum
- Adequate cough and ability to clear sputum spontaneously

CVS:

- Heart rate < 140 bpm
- Stable rhythm, ie: sinus or AF/heart block if this is normal for the patient
- Minimal or no inotropic/vasopressor support with adequate Mean Arterial Pressure (MAP)
- pH 7.35 – 7.45
- Normothermic

NEURO:

- Sedation off, awake & appropriate and can obey commands
- No significant neuro deficits
- Any pain well controlled

HYDRATION/NUTRITION:

- Fluid balance: may need to have negative balance (medical team decision). Not overly oedematous.
- Blood glucose within normal ranges
- **IF NG FEEDING USED, FEED MUST BE PAUSED FOR 4HRS+ PRIOR TO EXTUBATION.**

1. INTRODUCTION

Extubation is a potentially dangerous time for ICU patients as they may have deconditioned muscles, poor nutrition, upper airway oedema due to prolonged translaryngeal intubation, inability to clear secretions, decreased level of consciousness due to persistent effects of sedatives and analgesics and critical illness polyneuropathy. The incidence of failed extubation is between 6 and 47%. The complications following extubation include increased incidence of nosocomial infection, ICU and hospital length of stay, and mortality.

2. PROCESS

Recommendation (Action)	Justification (Rationale)
No patient should be extubated unless discussed with the ICU Consultant or senior trainee	The person sanctioning extubation must be able to reintubate if required
Ideally extubations should not be performed out of hours	Any patient may present a difficult airway
Suction above the cords before cuff deflation	Both a cuff leak test or deflation of the cuff prior to extubation may expose the patient to risk of aspiration from oral secretions
The RSBI is of limited use	Several studies have shown some benefit from using the a RSBI ≤ 57 to predict successful extubation. Others have found it less useful and clinical experience remains the best predictor of successful extubation
The guideline is intended for patients who have endotracheal tubes only	There is a separate tracheostomy weaning and decannulation guideline.
This guideline should be used in combination with the SBT guidelines	Not all patients suitable for SBT will be suitable for extubation but there will be some overlap and patients must pass the SBT to be extubated
Successful extubation requires all the necessary organs to be functioning	Good neurological function, competent airway, minimal secretions, good respiratory muscle strength and adequate cardiovascular reserve are essential for successful extubation
Accidental extubation or self-extubation is not covered by these guidelines	This scenario requires the immediate assistance of a doctor with advanced airway skills

3. GLOSSARY

SBT Spontaneous Breathing Trial

LOS Length of stay

4. REFERENCES AND ONLINE RESOURCES

- Basics of Anaesthesia 6th ed. Miller & Pardo Jr. 2011
Textbook of Anaesthesia 6th ed. Aitkenhead, Moppett & Thompson 2013.
Anaesthesia & Intensive Care A-Z 4th ed. Yentis, Hirsch & Smith 2009
Difficult Airway Society (DAS) 'Extubation Algorithm: Basic/Low Risk./At Risk' 2011
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Respiratory Care 57: 10, 1611-1617. 2012
British Thoracic Society Emergency Oxygen Guideline Group. 'Guideline for emergency oxygen use in adult patients'. THORAX vol 63 October 2008
Mechanical Ventilation: physiological & clinical applications.4th ed. Pilbeam & Cairo. 2006
4th National Audit Project of the Royal College of Anaesthetists & the Difficult Airway Society (NAP4). 'Major Complications of Airway Management in the United Kingdom' March 2011
Epstein SK, Ciubotaru RL, Wong JB. Effect of failed extubation on the outcome of mechanical ventilation Chest. 1997 Jul;112(1):186-92.

The use of this guideline is subject to professional judgement and accountability. This guideline has been prepared carefully and in good faith for use within the Department of Critical Care at Brighton and Sussex University Hospitals. The decision to implement this guideline is at the discretion of the on-call critical care consultant in conjunction with appropriate critical care medical/ nursing staff.