Extubation Guidelines

EXTUBATION GUIDELINES FOR CRITICAL CARE

Extubation Appropriateness Test
(see over)

RESOLVE CAUSE
* titrate ventilation
* refer back to shift leader & ITU cons

pass

CUFF LEAK TEST
(IF APPROPRIATE)
Deflate ETT cuff, listen for audible leak of air at mouth

fail

RESOLVE CAUSE
* reinflate ETT cuff
* +/- sedation

DEcision to extubate: Safe to proceed?
* intubation grade
* time of day & unit workload
* appropriate staff anaesthetist on ITU
CALL ENT Dr in advance if required: see 'Airway Emergency' box below

no

MAINTAIN SAFETY
* leave ETT in situ
* +/- sedation
* re-assess

yes

prepare and undertake extubation (2 person procedure)
* unpin pt & sit them up in bed
* prepare O2 therapy & check safety equipment, +/- intubation box
* scissors, incomp & 10ml syringe
* suction oesophagus & ETT
* 100% O2 via waters circuit
* cut ties, deflate balloon ( +/- give positive pressure breath) & remove ETT at peak inspiration
* clear mouth with yankauer sucker & apply O2 therapy
OBSERVE CLOSELY FOR 30 MINS, DO NOT LEAVE BEDSPACE

signs of extubation failure?
* increased work of breathing, increased/decreased resp rate
* deteriorating ABGs/SeO2
* CVS instability
* agitation or change in GCS

** call for help**

Intervene
* ABCDE assessment
* positioning
* nebs/physo/suction
* reassure pt

Further resp support
* CPAP/BiPAP/maskal HiFlo
* NP airway

Expert help from anaesthetist/cons

Airway emergency:
ring 2222 'anaesthetic support'
Contact ENT registrar: bleep via switch or ENT OPD
4819/4811/4815
Contact ENT Consultant via switch/aircall

Continue post extubation care
Observe pt for failure signs for next 72hrs
* phyno
* nebs
* mobilise as able

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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 (i.e. INTUBATION GRADE > GRADE 2)?

BREATHING:
- SaO2 ≥ 92% on FIO2 ≤ 0.4
- PEEP ≤ 5cms
- RESPIRATORY RATE ≤ 35 per min
- TIDAL VOLUME (Vt) ≥ 5mls/kg
- RAPID SHALLOW BREATHING INDEX (RSBi) < 105 (observe patient for 1 minute; divide resp rate by average tidal volume in litres i.e. 20bpm/ 0.250l = RSBi 80)
- PaO2/PaCO2 within acceptable limits for patient
- No significant respiratory acidosis
- No excessive sputum
- Adequate cough and ability to clear sputum spontaneously

CVS:
- Heart rate < 140bpm
- Stable rhythm, i.e. 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

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

SBT  Spontaneous Breathing Trial
LOS  Length of stay

4. REFERENCES AND ONLINE RESOURCES

Difficult Airway Society (DAS) ‘Extubation Algorithm: Basic/Low Risk./At Risk’ 2011
‘Clinical review: post-extubation laryngeal oedema & extubation failure in adult critically ill patients’.
Wittekamp et al. Critical Care 13:233 2009
‘Evidence-Based assessments in the Ventilator Discontinuation Process’. MacIntyre, N.
Respiratory Care 57: 10, 1611-1617. 2012
Mechanical Ventilation: physiological & clinical applications.4th ed. Pilbeam & Cairo. 2006

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.

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