Extubation Guidelines

Extubation Appropriateness Test

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

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

RESOLVE CAUSE
* reinflate ETT cuff
* +/- sedation

DECISION TO EXTUBATE: SAFE TO PROCEED?
* intubation grade
* time of day & unit workload
* appropriate staff anesthetist on ITU
* will you need an ENT Dr (see ‘Airway Emergency’)

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

PREPARE AND UNDERTAKE EXTUBATION (2 PERSON PROCEDURE)
* inform pt & sit them up in bed
* prepare O2 therapy & check safety equipment, +/- intubation box
* scissors, incaps & 10ml syringe
* suction oropharynx & 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 30MINS, DO NOT LEAVE BEDSPACE

SIGNS OF EXTUBATION FAILURE?
* increased work of breathing, increased/decreased resp rate
* deteriorating ABGs/SaO2
* CVS instability
* agitation or change in GCS

**CALL FOR HELP**
INTERVENE
* ABCDE assessment
* position
* nebs/physio/suction
* reassure pt

FURTHER RESP SUPPORT
* CPAP/BiPAP
* NP airway

EXPERT HELP FROM ANAESTHETIST/CONS

AIRWAY EMERGENCY:
* ring 2222 ‘anaesthetic support’
* contact ENT registrars: Kling via switch or ENT ofD 4910/4911/4812
* contact ENT Consultant via switch/aircall

CONTINUE POST EXTUBATION CARE
* observe pt for failure signs for next 72hrs
* physio
* nebs
* mobilise as able
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 24 HRS?
- WAS THE PATIENT A DIFFICULT INTUBATION (ie: INTUBATION GRADE > GRADE 2)?

BREATHING:
- SaO2 ≥ 92% on FIO2 ≤ 0.4
- PEEP ≤ 5cm
- RESPIRATORY RATE ≤ 35 per min
- TIDAL VOLUME (Vt) ≥ 5ml/kg
- RAPID SHALLOW BREATHING INDEX (RSBI) < 105 (observe patient for 1 minute; divide resp rate by average tidal volume in litres ie: 20/min/ 0.2501 = 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, 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
- Northermic

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 3HRS+ 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 sedative 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 LOS 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>Extubations should not be performed out of hours</td>
<td>Any patient may present a difficult airway</td>
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<tr>
<td>The RSBI is of limited use</td>
<td>Several studies have shown some benefit from using the 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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3. GLOSSARY

SBT Spontaneous Breathing Trial
LOS Length of stay

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Authors: EBL
4. REFERENCES AND ONLINE RESOURCES

Difficult Airway Society (DAS) ‘Extubation Algorithm: Basic/Low Risk./At Risk’ 2011
‘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