Failed Intubation in Obstetric Patients
Clinical Guideline
V2.0 September 2018
1. **Aim/Purpose of this Guideline**
   To give guidance to obstetric anaesthetists in the preparation for general anaesthesia and management of a failed intubation in an obstetric patient.

2. **The Guidance**

2.1. **Definition**
   A failed intubation in obstetrics is one that is not accomplished following a rapid sequence induction of anaesthesia.

2.2. **Incidence**
   The incidence of failed intubation has been shown to be as high as 1 in 250 in obstetric patients.

2.3. **Background**
   Failed tracheal intubation is an important factor contributing to maternal morbidity and mortality and can delay the delivery of the compromised foetus. Anaesthetists cannot always predict difficult intubations, but the following can minimise the risk:
   - Adequate assessment of the airway pre-operatively
   - Having adjunctive airway equipment available
   - A plan as to whether to wake the patient or proceed with surgery in the event of failed intubation (New 2018)
   - Having a robust plan for the management of a failed intubation (Failed Intubation Drill) In 2015 the Difficult airway society (DAS) in conjunction with the Obstetric Anaesthetists Association (OAA) produced new guidelines for the management of difficult and failed intubation in obstetric patients. These are the first national obstetric-specific failed intubation guidelines in the UK (New 2018).

2.4 (New 2018) DAS and OAA guidelines for difficult and failed intubation consists of 4 algorithms and 2 tables (see appendices)
   - Master algorithm gives an overview (Appendix 3)
   - Algorithm 1 gives a framework on how to optimise a safe general anaesthetic (GA) technique (Appendix 4)
   - Table 1 gives a structure for deciding whether to wake the patient or proceed should intubation fail (Appendix 5)
   - Algorithm 2 summarises the management of failed tracheal intubation (appendix 6)
   - Algorithm 3 covers ‘can’t intubate, can’t oxygenate’ (Appendix 7)
   - Table 2 gives management after failed intubation (Appendix 8)

2.5 (New 2018) **Algorithm 1**
   Importance of preparation and planning

2.5.1 **Pre-theatre planning**
   - An anaesthetic risk assessment should be completed at booking by the midwife and should any single risk factor be identified a referral to the obstetric anaesthetic clinic should be made.
   Women predicted to have airway difficulties should be referred antenatally for specific anaesthetic plan (New 2018)
• Airway assessment
An anaesthetic assessment should be made and should include airway assessment for bag mask ventilation, intubation, and front-of-neck access. Oral piercings should be removed (New 2018)

• Fasting status and antacid prophylaxis (New 2018)
Refer to RCHT fasting guidelines for general anaesthesia
H2 receptor antagonists should be prescribed the night before surgery and the morning of surgery for elective Caesarean Section.
High risk women in labour should not eat but may have clear fluids and be prescribed regular H2 Receptor antagonists every 6h for the duration of their labour.
If no H2 receptor antagonist has been administered it should be given iv prior to induction
Sodium Citrate should be administered prior to induction (New 2018)

2.5.2 Plan with team (New 2018)
• Category of Caesarean section
• WHO checklist. May be modified for category 1 Caesarean section
• Check standardised difficult airway equipment trolley is available
• Identify senior help and call if necessary
• Whether to continue or wake patient if difficult intubation occurs. Refer to Table 1 (Appendix 3)
• Has intrauterine fetal resuscitation been undertaken?

Table 1 – to wake patient or proceed with surgery? (Appendix 3) (New 2018)
• This should be discussed with the obstetric team prior to induction and factors listed in Table 1 should be considered
• The anaesthetist should consider whether (s)he would be happy to proceed with surgery with a Supraglottic Airway Device (SAD)
• Overriding reason to proceed with GA is maternal compromise not responsive to resuscitation and acute foetal compromise secondary to an irreversible cause
• Firm Indications to wake the mother are supraglottic swelling and continued airway obstruction in the presence of optimised SAD management.

2.5.3 Rapid sequence induction (New 2018)
Optimise patient position
• Left lateral tilt
• Head up 20-30 degrees.
• Ramped position in morbidly obese parturients

Pre-oxygenation
• To fractional ET O2>0.9
• Consider high-flow humidified Oxygen (apnoeic oxygenation) using THRIVE

Cricoid pressure
• 10N increasing to 30N as patient loses consciousness
• Reduce this to 20N if patient head-up
• Low threshold to release cricoid pressure if intubation or mask ventilation prove difficult.
• Be prepared to reapply cricoid pressure, suction and introduce head-down tilt if regurgitation should occur

Drug administration
• Propofol vs Thiopentone. Use drug most familiar to your practise. Advantage of Propofol is familiarity and suppression of laryngeal reflexes for SAD. Ensure adequate dose
• Suxamethonium vs Rocuronium. Suxamethonium increases oxygen consumption and may cause earlier desaturation. **DO NOT GIVE A 2ND DOSE of SUXAMETHONIUM** no matter how tempting
• Rocuronium/Sugamadex combination is expensive

Consider facemask ventilation
• Low inflation breaths at low pressures (<20cmH2O) after induction.

First intubation attempt
• Consider videolaryngoscope as first line device in morbidly obese, potential difficult airway and in second intubation attempt if mac blade was used initially.
• If first attempt fails, consider repositioning, releasing cricoid or manipulating assistants hand, different laryngoscope, bougie. Avoid airway trauma.

Second intubation attempt
• By most experienced anaesthetist present
• Consider manoeuvres above
• Consider further dose of induction agent to prevent awareness

Verify tracheal intubation
• Capnography
• Visualising tube between cords
• Auscultation
• Fibre optic visualisation of tracheal rings and carina

2.5.4 Important points
The prime aim of the failed intubation drill is to keep the mother oxygenated. Regional anaesthesia is preferred to a general anaesthetic for delivery of the distressed neonate by caesarean section unless contraindicated. Maternal welfare always takes precedence over fetal compromise. Morbidly obese women should not be anaesthetised by trainees without senior consultation.

2.6 Algorithm 2 Obstetric failed tracheal intubation (Appendix 4) (New 2018)
• If second attempt is unsuccessful declare a failed intubation to the team
• Request more experienced help
• **MAINTAIN OXYGENATION** via facemask or SAD
• Prevent aspiration and awareness
• Consider oropharyngeal airway, 2-person technique and release of cricoid pressure if facemask ventilation is difficult
• If facemask ventilation difficult and decision has been made to proceed with surgery, insert 2nd generation SAD with gastric drain (May need to release cricoid pressure)
• If first SAD does not provide effective airway, insert alternative size or device
• Maximum of 2 insertions

2.7 Algorithm 3 “Can’t intubate, can’t oxygenate” (New 2018)

• Ensure all modifiable features have been treated, eg laryngeal spasm, poor chest wall compliance. A further dose of muscle relaxant may improve the situation.
• Call specialist help, ie ENT surgeon or intensivist.
• Attempt front of neck procedure with blade and endo tracheal tube.
• In the event of failure to restore oxygenation- cardiac arrest protocol should be followed including Caesarean Delivery

2.7.1 If adequate oxygenation has been maintained a decision as to wake the patient or proceed should be made Table 2 (Appendix 3) (New 2018)

2.7.2 Decision to wake (New 2018)
• Decision to wake patient may be based on presence of partially compromised airway with suboptimal airway control, airway oedema, stridor, and airway bleeding.
• If decision to wake, maintain oxygenation and avoid regurgitation, vomiting and awareness.
• Beware laryngeal spasm on arousal.
• Reverse muscle relaxant
• Review urgency of delivery of fetus with obstetrician on awakening – consider regional technique, awake intubation, or elective tracheostomy.
• Inform neonatologist.

2.7.3 Decision to proceed.
Key issues to consider are:
• Airway device and ventilation strategy
• Maintenance of anaesthesia
• Use of cricoid pressure
• Drainage of gastric contents
• Plans to perform delayed tracheal intubation
• Surgery should be performed by most experienced surgeon present
• Constant evaluation of airway patency, ventilation and oxygenation throughout case

May have to accept suboptimal conditions until after delivery when pulmonary compliance may improve.

2.8 Extubation of the trachea (New 2018)
• 30% of adverse events occur at the end of anaesthesia (4th NAP project)
• Key issues are planning and preparation including options for re-intubation
• Perform awake extubation unless transfer to the intensive care unit for controlled ventilation and extubation is indicated
2.9  Debriefing and follow-up (New 2018)

- Successful debriefing is achieved by identifying aspects of good performance, areas of improvement and suggestions of what could have been done differently in future.
- Perform follow-up visit. If necessary arrange an ENT review if evidence of airway trauma.
- Ask specifically about awareness.
- Full documentation should be made about ease of bag mask ventilation, grade of laryngoscopy, airway equipment or adjuncts use.
- For a difficult/failed intubation a letter for the patient and for her GP should be sent.

2.10. Training and awareness

Annual training to be carried out by all the anaesthetists that work on the obstetric unit.

2.11. Documentation

There should be clear documentation in the maternal records as to the events and treatment administered.

3. Monitoring compliance and effectiveness

<table>
<thead>
<tr>
<th>Element to be monitored</th>
<th>All cases of failed intubation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>Anaesthetic Risk Management Lead.</td>
</tr>
<tr>
<td>Tool</td>
<td>All cases of failed intubation will be reported via the trusts electronic reporting system (Datix) and reviewed at the clinical incident review meeting.</td>
</tr>
<tr>
<td>Frequency</td>
<td>Every case</td>
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<tr>
<td>Reporting arrangements</td>
<td>Individual feedback for each case. Any training needs identified to be reported to the anaesthetic training lead consultant.</td>
</tr>
<tr>
<td>Acting on recommendations and Lead(s)</td>
<td>Any action plans will be monitored though the Maternity Risk Management Forum.</td>
</tr>
<tr>
<td>Change in practice and lessons to be shared</td>
<td>One to one individual feedback. Training needs addressed through Consultant Anesthetic Training Lead.</td>
</tr>
</tbody>
</table>

4. Equality and Diversity

4.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement which can be found in the 'Equality, Diversity & Human Rights Policy' or the Equality and Diversity website.

4.2. Equality Impact Assessment

The Initial Equality Impact Assessment Screening Form is at Appendix 2.
## Appendix 1. Governance Information

<table>
<thead>
<tr>
<th>Document Title</th>
<th>Failed Intubation In Obstetric Patients Clinical Guideline V2.0</th>
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<tbody>
<tr>
<td>Date Issued/Approved:</td>
<td>6th September 2018</td>
</tr>
<tr>
<td>Date Valid From:</td>
<td>10th October 2018</td>
</tr>
<tr>
<td>Date Valid To:</td>
<td>10th October 2021</td>
</tr>
<tr>
<td>Directorate / Department responsible (author/owner):</td>
<td>Dr Sam Banks Obstetric and Gynaecology Directorate</td>
</tr>
<tr>
<td>Contact details:</td>
<td>01872 253132</td>
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<tr>
<td>Brief summary of contents</td>
<td>To give guidance to obstetric anaesthetists in the management of a failed intubation in an obstetric patient</td>
</tr>
<tr>
<td>Suggested Keywords:</td>
<td>Failed, intubation, general, anaesthetic, emergency, obstetric, GA</td>
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<td>Target Audience</td>
<td>RCHT</td>
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<td>Medical Director</td>
</tr>
<tr>
<td>Date revised:</td>
<td>August 2018</td>
</tr>
<tr>
<td>This document replaces (exact title of previous version):</td>
<td>Failed intubation in obstetric patients v1.3</td>
</tr>
<tr>
<td>Approval route (names of committees)/consultation:</td>
<td>Obstetric Consultant Anaesthetists Meeting Maternity Guidelines Group Obs and Gynae Directorate Policy review group</td>
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<tr>
<td>Divisional Manager confirming approval processes</td>
<td>Tunde Adewopo</td>
</tr>
<tr>
<td>Name and Post Title of additional signatories</td>
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</tr>
<tr>
<td>Name and Signature of Divisional/Directorate Governance Lead confirming approval by specialty and divisional management meetings</td>
<td>{Original Copy Signed} Name: Caroline Amukusana</td>
</tr>
<tr>
<td>Signature of Executive Director giving approval</td>
<td>{Original Copy Signed}</td>
</tr>
<tr>
<td>Publication Location (refer to Policy)</td>
<td>Internet &amp; Intranet</td>
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Failed Intubation in Obstetric Patients Clinical Guideline V2.0
| Related Documents: |
|-------------------|------------------|
| - Obstetric Anaesthetist Association website – www.oaa-anaes.ac.uk |
| - Royal College of Anaesthetists website – www.rcoa.ac.uk |
| - M C Mushambi et al. OAA and DAS guidelines for the management of difficult and failed tracheal intubation in obstetrics: Anaesthesia 2015, 70,1286-1306 |

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<th>Training Need Identified?</th>
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Version Control Table

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<th>Version</th>
<th>Summary of Changes</th>
<th>Changes Made by (Name and Job Title)</th>
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<td>January 2006</td>
<td>V1.0</td>
<td>Initial Issue.</td>
<td>Dr Bill Harvey Consultant Anaesthetist.</td>
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<td>December 2009</td>
<td>V1.1</td>
<td>Addition of a flow chart.</td>
<td>Dr Catherine Ralph Consultant Anaesthetist.</td>
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<td>February 2012</td>
<td>V1.2</td>
<td>Addition of compliance monitoring table.</td>
<td>Dr Catherine Ralph Consultant Anaesthetist.</td>
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<td>17th July 2015</td>
<td>V1.3</td>
<td>Minor change: Spontaneously Breathing following General Anaesthetic: Proceed with caution</td>
<td>Dr Sam Banks Consultant Anaesthetist</td>
</tr>
<tr>
<td>6th September 2018</td>
<td>V2.0</td>
<td>Major change to include DAS/OAA guidelines</td>
<td>Dr Sam Banks Consultant Anaesthetist</td>
</tr>
</tbody>
</table>

All or part of this document can be released under the Freedom of Information Act 2000

This document is to be retained for 10 years from the date of expiry. This document is only valid on the day of printing

Controlled Document
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### Appendix 2. Initial Equality Impact Assessment Form

*This assessment will need to be completed in stages to allow for adequate consultation with the relevant groups.*

<table>
<thead>
<tr>
<th>Name of the strategy / policy / proposal / service function to be assessed</th>
<th>Directorate and service area: Obstetrics &amp; Gynaecology</th>
<th>Is this a new or existing Policy?</th>
<th>Name of individual completing assessment: Sam Banks</th>
<th>Telephone: 01872 252879</th>
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<tr>
<td>1. Policy Aim*</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Who is the strategy / policy / proposal / service function aimed at?</td>
<td>To give guidance to obstetric anaesthetists in the management of a failed intubation in an obstetric patient.</td>
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<td>2. Policy Objectives*</td>
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<td>To appropriately manage a failed intubation incident in the obstetric patient.</td>
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<td>3. Policy – intended Outcomes*</td>
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<tr>
<td>Safety of the woman.</td>
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<td>4. *How will you measure the outcome?</td>
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<td>As per Compliance Monitoring Tool.</td>
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<td>5. Who is intended to benefit from the policy?</td>
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<tr>
<td>Obstetric patients undergoing general anaesthesia.</td>
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<td>6a Who did you consult with</td>
<td>Workforce</td>
<td>Patients</td>
<td>Local groups</td>
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<td>b). Please identify the groups who have been consulted about this procedure.</td>
<td>Obstetric Consultant Anaesthetists Meeting, Maternity Guidelines Group, Obs and Gynaec Directorate, Policy review group</td>
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<td>What was the outcome of the consultation?</td>
<td>Guideline agreed</td>
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7. The Impact
Please complete the following table. If you are unsure/don’t know if there is a negative impact you need to repeat the consultation step.

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<th>Equality Strands:</th>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
<th>Rationale for Assessment / Existing Evidence</th>
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<td>Age</td>
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<td>All pregnant women</td>
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<td>Sex (male, female, trans-gender / gender reassignment)</td>
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<td>X</td>
<td></td>
<td>All pregnant women</td>
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<td>Race / Ethnic communities /groups</td>
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<td>Disability - Learning disability, physical impairment, sensory impairment, mental health conditions and some long term health conditions.</td>
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<td>Religion / other beliefs</td>
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<td>All pregnant women</td>
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<td>Marriage and Civil partnership</td>
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<td>Pregnancy and maternity</td>
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<td>Sexual Orientation, Bisexual, Gay, heterosexual, Lesbian</td>
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<td>All pregnant women</td>
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You will need to continue to a full Equality Impact Assessment if the following have been highlighted:
- You have ticked “Yes” in any column above and
- No consultation or evidence of there being consultation - this excludes any policies which have been identified as not requiring consultation. or
- Major this relates to service redesign or development

8. Please indicate if a full equality analysis is recommended. [Yes] [No] [X]

9. If you are not recommending a Full Impact assessment please explain why.

No areas indicated
Keep one copy and send a copy to the Human Rights, Equality and Inclusion Lead
c/o Royal Cornwall Hospitals NHS Trust, Human Resources Department, Knowledge Spa, Truro, Cornwall, TR1 3HD

This EIA will not be uploaded to the Trust website without the signature of the Human Rights, Equality & Inclusion Lead.

A summary of the results will be published on the Trust’s web site.

Signed Sarah-Jane Pedler

Date 6th September 2018
Appendix 3

Master algorithm – obstetric general anaesthesia and failed tracheal intubation

Algorithm 1: Safe obstetric general anaesthesia
- Pre-induction planning and preparation
  - Team discussion
- Rapid sequence induction
  - Consider facemask ventilation ($P_{EP} > 20$ cmH$_2$O)
- Laryngoscopy
  - (maximum 2 intubation attempts; 3rd intubation attempt only by experienced colleague)
- Verify successful tracheal intubation and proceed
  - Plan extubation

Algorithm 2: Obstetric failed tracheal intubation
- Declare failed intubation
  - Call for help
  - Maintain oxygenation
  - Supraglottic airway device (maximum 2 attempts) or facemask
- Is it essential / safe to proceed with surgery immediately?
  - No
  - Wake
  - Yes
  - Proceed with surgery

Algorithm 3: Can’t intubate, can’t oxygenate
- Declare CICO
  - Give 100% oxygen
  - Exclude laryngospasm – ensure neuromuscular blockade
  - Front-of-neck access
- Plan with team
  - WHO safety checklist / general anaesthetic checklist
  - Identify senior help, alert if appropriate
  - Plan equipment for difficult / failed intubation
  - Plan for / discuss: wake up or proceed with surgery (Table 1)
- Rapid sequence induction
  - Check airway equipment, suction, intravenous access
  - Optimise position – head up / ramping + left uterine displacement
  - Pre-oxygenate to $F_{O_2} > 0.9$ / consider nasal oxygenation
  - Cricoid pressure (10 N increasing to 30 N maximum)
  - Deliver appropriate induction / neuromuscular blocker doses
  - Consider facemask ventilation ($P_{EP} > 20$ cmH$_2$O)
- 1st intubation attempt
  - If poor view of larynx optimise attempt by:
    - reducing / removing cricoid pressure
    - external laryngeal manipulation
    - repositioning head / neck
    - using bougie / stylet
  - Ventilate with facemask
    - Communicate with assistant
  - Verify successful tracheal intubation
    - Proceed with anaesthesia and surgery
    - Plan extubation
- 2nd intubation attempt
  - Consider:
    - alternative laryngoscope
    - removing cricoid pressure
  - 3rd intubation attempt only by experienced colleague

Algorithm 2 – obstetric failed tracheal intubation

Declare failed intubation
Theatre team to call for help
Priority is to maintain oxygenation

Supraglottic airway device
(2nd generation preferable)
Remove cricoid pressure during insertion
(maximum 2 attempts)

Facemask +/- oropharyngeal airway
Consider:
• 2-person facemask technique
• Reducing / removing cricoid pressure

Is adequate oxygenation possible?

Follow Algorithm 3
Can’t intubate, can’t oxygenate

Is it essential / safe to proceed with surgery immediately?*

No

Wake

Yes

Proceed with surgery

*See Table 1, 2

Algorithm 3 – can’t intubate, can’t oxygenate

Declare emergency to theatre team
Call additional specialist help (ENT surgeon, intensivist)
Give 100% oxygen
Exclude laryngospasm – ensure neuromuscular blockade

Perform front-of-neck procedure

Is oxygenation restored?

No

Maternal advanced life support
Perimortem caesarean section

Yes

Is it essential / safe to proceed with surgery immediately?*

No

Wake

Yes

Proceed with surgery

*See Table 1, 2
### Table 1 – proceed with surgery?

<table>
<thead>
<tr>
<th>Factors to consider</th>
<th>WAKE</th>
<th>PROCEED</th>
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<tbody>
<tr>
<td>Maternal condition</td>
<td>• No compromise</td>
<td>• Mild acute compromise</td>
</tr>
<tr>
<td>Fetal condition</td>
<td>• No compromise</td>
<td>• Compromise corrected with intratracheal resuscitation, pH &lt; 7.2 but &gt; 7.15</td>
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<tr>
<td>Anaesthetist</td>
<td>• Novice</td>
<td>• Junior trainee</td>
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<td>Obesity</td>
<td>• Supermorbid</td>
<td>• Morbid</td>
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<td>Surgical factors</td>
<td>• Complex surgery or major haemorrhage anticipated</td>
<td>• Multiple uterine scars</td>
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<td>Aspiration risk</td>
<td>• Recent food</td>
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<td>• Adequate facemask ventilation</td>
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<tr>
<td>Airway hazards</td>
<td>• Laryngeal oedema</td>
<td>• Stridor</td>
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Criteria to be used in the decision to wake or proceed following failed tracheal intubation. In any individual patient, some factors may suggest waking and others proceeding. The final decision will depend on the anaesthetist’s clinical judgement. © Obstetric Anaesthetists’ Association / Difficult Airway Society (2015)

### Table 2 – management after failed tracheal intubation

#### Wake
- Maintain oxygenation
- Maintain cricoid pressure if not impeding ventilation
- Either maintain head-up position or turn left lateral recumbent
- If rocuronium used, reverse with sugammadex
- Assess neuromuscular blockade and manage awareness if paralysis is prolonged
- Anticipate laryngospasm / can’t intubate, can’t oxygenate

#### Proceed with surgery
- Maintain anaesthesia
- Maintain ventilation - consider merits of:
  - controlled or spontaneous ventilation
  - paralysis with rocuronium if sugammadex available
- Anticipate laryngospasm / can’t intubate, can’t oxygenate
- Minimise aspiration risk:
  - maintain cricoid pressure until delivery (if not impeding ventilation)
  - after delivery maintain vigilance and reapply cricoid pressure if signs of regurgitation
  - empty stomach with gastric drain tube if using second-generation supraglottic airway device
  - minimise fundal pressure
  - administer H₂ receptor blocker i.v. if not already given
- Senior obstetrician to operate
- Inform neonatal team about failed intubation
- Consider total intravenous anaesthesia

