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 ($P_{max} \leq 20 \text{ cmH}_2\text{O}$)

Laryngoscopy
(maximum 2 intubation attempts; 3rd intubation attempt only by experienced colleague)

Success: Verify successful tracheal intubation and proceed
Plan extubation

Fail

Algorithm 2
Obstetric failed tracheal intubation

Declare failed intubation
Call for help
Maintain oxygenation
Supraglottic airway device (maximum 2 attempts) or facemask

Success

Fail

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

Yes

Proceed with surgery $\S$

No

Wake $\S$

Algorithm 3
Can’t intubate, can’t oxygenate

Declare CICO
Give 100% oxygen
Exclude laryngospasm – ensure neuromuscular blockade
Front-of-neck access

*See Table 1, $\S$See Table 2

Algorithm 1 – safe obstetric general anaesthesia

Pre-theatre preparation
- Airway assessment
- Fasting status
- Antacid prophylaxis
- Intrauterine fetal resuscitation if appropriate

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 $F_{ET}O_2 \geq 0.9$ / consider nasal oxygenation
- Cricoid pressure (10 N increasing to 30 N maximum)
- Deliver appropriate induction / neuromuscular blocker doses
- Consider facemask ventilation ($P_{max} \leq 20$ 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

Fail
- Ventilate with facemask
- Communicate with assistant

Success
- 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

Fail
- Follow Algorithm 2 – obstetric failed tracheal intubation
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

Proceed with surgery§

Yes

Wake§

*See Table 1, §See Table 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, §See Table 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><strong>Maternal condition</strong></td>
<td>• No compromise</td>
<td>• Mild acute compromise</td>
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<tr>
<td><strong>Fetal condition</strong></td>
<td>• No compromise</td>
<td>• Compromise corrected with intrauterine resuscitation, pH &lt; 7.2 but &gt; 7.15</td>
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<tr>
<td><strong>Anaesthetist</strong></td>
<td>• Novice</td>
<td>• Junior trainee</td>
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<tr>
<td><strong>Obesity</strong></td>
<td>• Supermorbid</td>
<td>• Morbid</td>
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<tr>
<td><strong>Surgical factors</strong></td>
<td>• Complex surgery or major haemorrhage anticipated</td>
<td>• Multiple uterine scars</td>
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<tr>
<td></td>
<td></td>
<td>• Some surgical difficulties expected</td>
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<tr>
<td><strong>Aspiration risk</strong></td>
<td>• Recent food</td>
<td>• No recent food</td>
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<td>• In labour</td>
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<td>• Opioids given</td>
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<td></td>
<td></td>
<td>• Antacids not given</td>
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<tr>
<td><strong>Alternative anaesthesia</strong></td>
<td>• No anticipated difficulty</td>
<td>• Predicted difficulty</td>
</tr>
<tr>
<td>• regional</td>
<td></td>
<td></td>
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<tr>
<td>• securing airway awake</td>
<td></td>
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<tr>
<td><strong>Airway device / ventilation</strong></td>
<td>• Difficult facemask ventilation</td>
<td>• Adequate facemask ventilation</td>
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<td></td>
<td>• Front-of-neck</td>
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<td><strong>Airway hazards</strong></td>
<td>• Laryngeal oedema</td>
<td>• Bleeding</td>
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<td>• Stridor</td>
<td>• Trauma</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.

## 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 H\textsubscript{2} receptor blocker i.v. if not already given
- Senior obstetrician to operate
- Inform neonatal team about failed intubation
- Consider total intravenous anaesthesia

### After waking

- Review urgency of surgery with obstetric team
- Intrauterine fetal resuscitation as appropriate
- For repeat anaesthesia, manage with two anaesthetists
- Anaesthetic options:
  - Regional anaesthesia preferably inserted in lateral position
  - Secure airway awake before repeat general anaesthesia