Difficult or Failed Intubation Management in Obstetric Patients

Classification:	Guideline
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Authors Division:	Surgical
Departments/Group this Document applies to:	Anaesthetic Department

Approval Group: Maternity CIG, Surgical CIG	**Date of Approval:**	Feb 2021
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Unique Identifier: MIDW/GL/43	**Status:** Approved	**Version No:** 6

Guideline to be followed by (target staff): Anaesthetist

To be read in conjunction with the following documents:

Are there any eCARE implications? No

CQC Fundamental standards:
Regulation 9 – person centered care
Regulation 10 – dignity and respect
Regulation 11 – Need for consent
Regulation 12 – Safe care and treatment
Regulation 13 – Safeguarding service users from abuse and improper treatment
Regulation 14 – Meeting nutritional and hydration needs
Regulation 15 – Premises and equipment
Regulation 16 – Receiving and acting on complaints
Regulation 17 – Good governance
Regulation 18 – Staffing
Regulation 19 – Fit and proper

Disclaimer

Since every patient's history is different, and even the most exhaustive sources of information cannot cover every possible eventuality, you should be aware that all information is provided in this document on the basis that the healthcare professionals responsible for patient care will retain full and sole responsibility for decisions relating to patient care; the document is intended to supplement, not substitute for, the expertise and judgment of physicians, pharmacists or other healthcare professionals and should not be taken as an indication of suitability of a particular treatment for a particular individual.

The ultimate responsibility for the use of the guideline, dosage of drugs and correct following of instructions as well as the interpretation of the published material **lies solely with you** as the medical practitioner.

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Guideline Statement

The purpose of this guideline is:

- To ensure there is evidence based system in place to manage difficulties with intubation or ventilation in obstetric patients requiring general anaesthesia
- To ensure all women who experience such emergency situation receive high quality, evidence based care

Executive Summary

Management of the obstetric difficult airway situation requires unique consideration and skills.

The definition of failed intubation is "failure to achieve tracheal intubation during rapid sequence induction to general anaesthesia, thereby initiating a failed intubation drill in an obstetric patient"

The incidence of failed intubation among the pregnant population is estimated to be at 1 in 224, up to eight times that of non-pregnant population (Clayton and Delvin, 2019).The reasons for this higher incidence in the obstetric population are multiple (UK Obstetric Surveillance System, 2010; Last updated 2020). Anatomical changes in the airway due to physiological changes in pregnancy, basic metabolic rate, lead to rapid progression to hypoxia following induction of general anaesthesia and apnea.

The consequences of failed intubation can be catastrophic and remains an important cause of maternal and neonatal morbidity and mortality.

The Obstetric Anaesthesia Association and Difficult Airway Society have developed the national obstetric guideline for safe management of difficult and failed tracheal intubation during general anaesthesia. They comprise four algorithms and two tables.

1.0 Roles and Responsibilities:

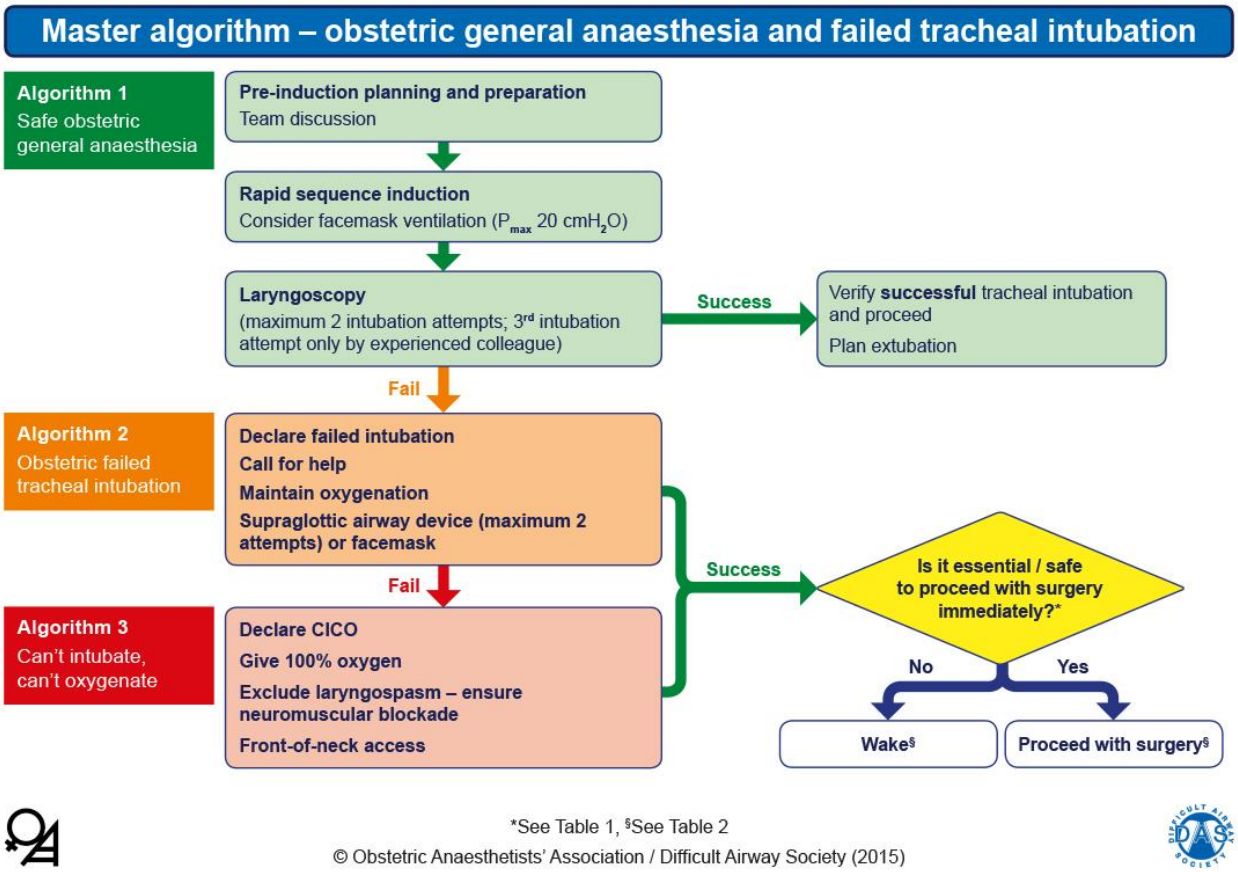
For use by anaesthetists and operating department practitioners.

2.0 Implementation and dissemination of document

This guideline is available on the Trust intranet and has followed the full guideline review process prior to publication.

Laminated copies of algorithms are available on the difficult intubation trolley in Theatres.

3.0 Processes and procedures



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} 20 cmH_2O)

***Optiflow THRIVE is** available for 100% O2 delivery system for preoxygenation and apneic oxygenation*

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

2nd intubation attempt
Consider:
- alternative laryngoscope
- removing cricoid pressure

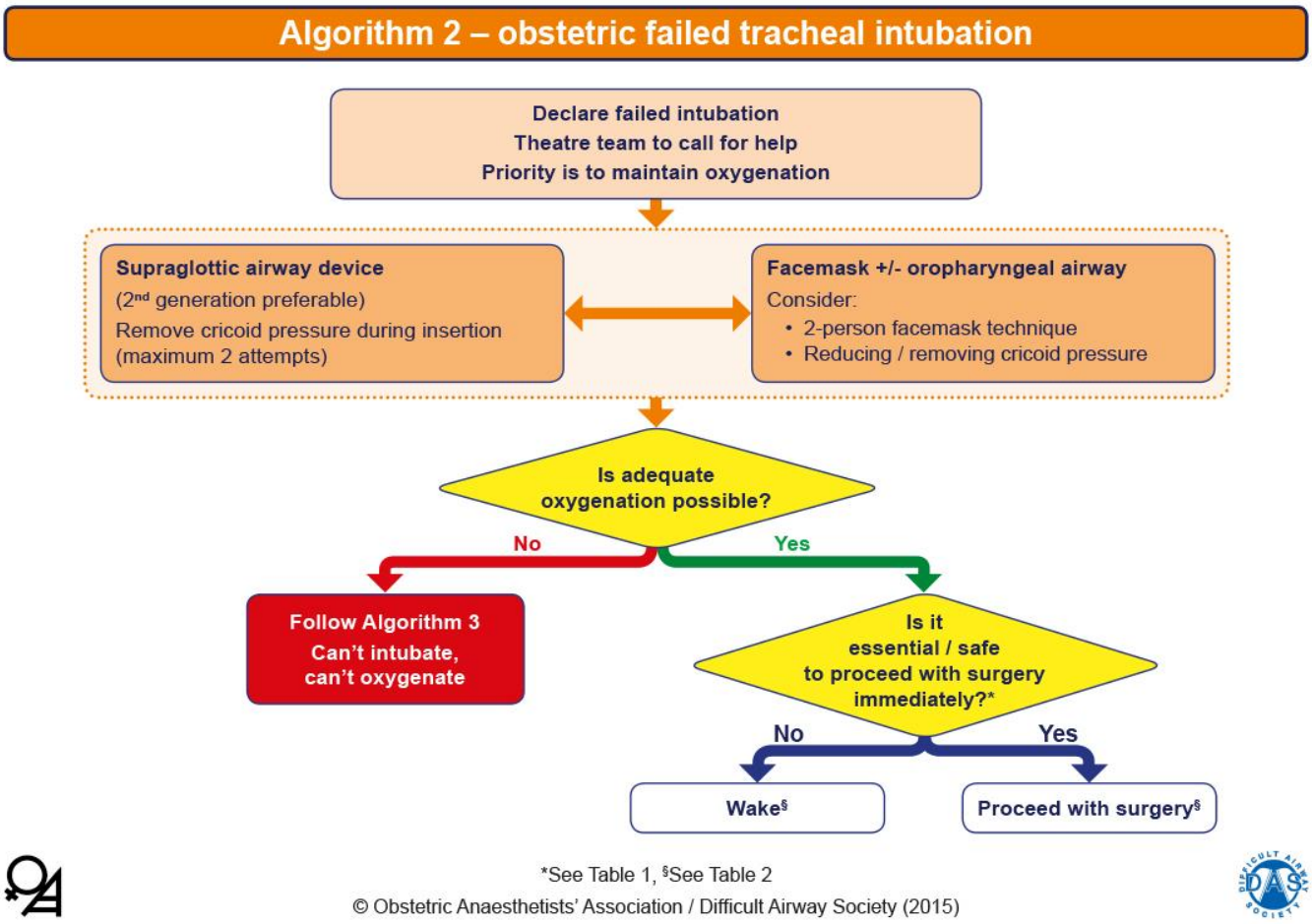
3rd Intubation attempt only by experienced colleague

Fail

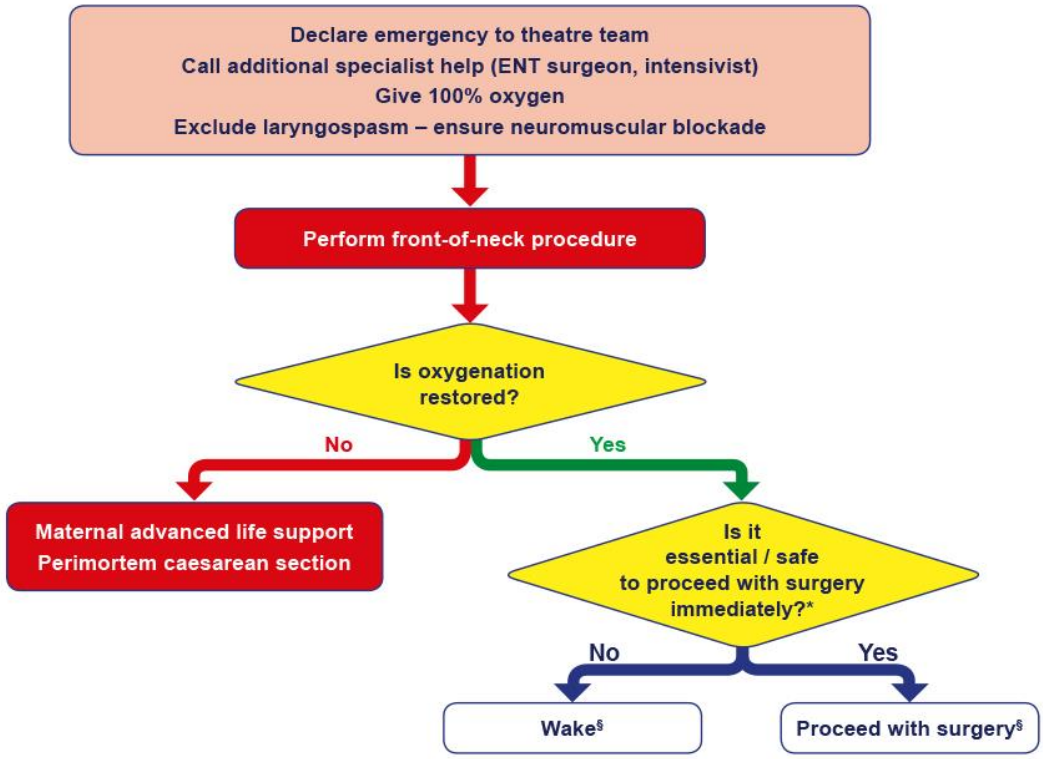
Follow Algorithm 2 – obstetric failed tracheal intubation

Success

Verify successful tracheal intubation
Proceed with anaesthesia and surgery
Plan extubation



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



*See Table 1, §See Table 2

Table 1 – proceed with surgery?

	Factors to consider	WAKE	←		PROCEED
Before induction	**Maternal condition**	• No compromise	• Mild acute compromise	• Haemorrhage responsive to resuscitation	• Hypovolaemia requiring corrective surgery • Critical cardiac or respiratory compromise, cardiac arrest
	Fetal condition	• No compromise	• Compromise corrected with intrauterine resuscitation, pH < 7.2 but > 7.15	• Continuing fetal heart rate abnormality despite intrauterine resuscitation, pH < 7.15	• Sustained bradycardia • Fetal haemorrhage • Suspected uterine rupture
	Anaesthetist	• Novice	• Junior trainee	• Senior trainee	• Consultant / specialist
	Obesity	• Supermorbid	• Morbid	• Obese	• Normal
	Surgical factors	• Complex surgery or major haemorrhage anticipated	• Multiple uterine scars • Some surgical difficulties expected	• Single uterine scar	• No risk factors
	Aspiration risk	• Recent food	• No recent food • In labour • Opioids given • Antacids not given	• No recent food • In labour • Opioids not given • Antacids given	• Fasted • Not in labour • Antacids given
	Alternative anaesthesia • **regional** • **securing airway awake**	• No anticipated difficulty	• Predicted difficulty	• Relatively contraindicated	• Absolutely contraindicated or has failed • Surgery started
After failed intubation	**Airway device / ventilation**	• Difficult facemask ventilation • Front-of-neck	• Adequate facemask ventilation	• First generation supraglottic airway device	• Second generation supraglottic airway device
	Airway hazards	• Laryngeal oedema • Stridor	• Bleeding • Trauma	• Secretions	• None evident

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

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

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_2 receptor blocker i.v. if not already given
- Senior obstetrician to operate
- Inform neonatal team about failed intubation
- Consider total intravenous anaesthesia

4.0 Statement of evidence/references

Statement of evidence:

The algorithms and tables in 3.0 Processes and procedures were reproduced from Mushambi MC, Kinsella SM, Popat M, Swales H, Ramaswamy KK, Winton AL, Quinn AC. Obstetric Anaesthetists' Association and Difficult Airway Society guidelines for the management of difficult and failed tracheal intubation in obstetrics. Anaesthesia 2015; 70: 1286 – 1306, with permission from Obstetric Anaesthetists' Association / Difficult Airway Society. (Obstetric Anaesthetists' Association [2015] 2015 guideline algorithms: notes on permission. [Online]. Available from: https://www.oaa-anaes.ac.uk/Permission_Guideline_Algorithms [Accessed 29 April 2021])

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Obstetric Anaesthetists' Association and Difficult Airway Society (2015c) Algorithm 3 - can't intubate, can't oxygenate. [Online]. In: Obstetric Anaesthetists' Association and Difficult Airway Society. [Algorithms and tables]. [p.4]. Available from: https://www.oaa-anaes.ac.uk/assets/_managed/cms/files/Clinical%20Guidelines/Guideline_Algorithms_2015.pdf [Accessed 29 April 2021]

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5.0 Governance

5.1 Document review history

Version number	Review date	Reviewed by	Changes made
1	March 2003	Anaesthetic Team	
2	June 2005	Anaesthetic Team	Reviewed
3	August 2007	Anaesthetic Team	Reviewed and updated
4	May 2011	Anaesthetic Team	Reviewed and updated
5	June 2014	Graziana Massolini	Reviewed and updated
6	January 2018	Bernadetta Sawarzynska-Ryszka	Reviewed and updated
7	January 2021	Bernadetta Sawarzynska-Ryszka Sahana Jaladi	Reviewed and updated

5.2 Consultation History

Stakeholders Name/Board	Area of Expertise	Date Sent	Date Received	Comments	Endorsed Yes/No
Dr Sahana Jaladi	Consultant Anaesthetist Difficult Airway Lead	25.01.21	25.02.21	There is not much evidence for using optiflow THRIVE for preoxygenation in pregnant patient but definitely good for providing apneic oxygenation. AIRVO- is variable oxygen delivery device which we have in phase 1&2 recovery areas for post op use. Whereas Optiflow THRIVE is 100% O2 delivery system which is used for preoxygenation and apneic oxygenation. We have this set up and ready to use in theatre 3 for GA sections. This message is been communicated to all the obstetric anaesthetist and we encourage them to use this.	Yes
Dr Hamid Manji	Consultant Anaesthetist		20.02.21	Recommends use of Airvo as a pre-oxygenating device.	Yes
Maternity guideline group	Women and children	09.02.21	09.02.21	No comments	Yes
Clinical Improvement Group	Women and children	09.02.21			

Anaesthetics & Theatres CSU	Anaesthetics & Theatres	15/03/2021	15/03/2021	Approved	Yes

5.3 Audit and monitoring

How will compliance of this Guideline be evidenced?.

Audit/Monitoring Criteria	Tool	Audit Lead	Frequency of Audit	Responsible Committee/Board
All episodes of failed intubations will be reviewed and shared with maternity and anaesthetic departments	Case review	Obstetric Anaesthesia Group	As required	Clinical Improvement Group

5.4 Equality Impact Assessment

As part of its development, this Guideline and its impact on equality has been reviewed. The purpose of the assessment is to minimise and if possible remove any disproportionate impact on the grounds of race, gender, disability, age, sexual orientation, religion or belief, pregnancy and maternity, gender reassignment or marriage and civil partnership. No detriment was identified. Equality Impact assessments will show any future actions required to overcome any identified barriers or discriminatory practice.

Equality Impact Assessment			
Division	Surgical	Department	Anaesthetics
Person completing the EqIA	Bernadetta Sawarzynska-Ryszka	Contact No.	
Others involved:	No	Date of assessment:	05/02/21
Existing policy/service	Yes	New policy/service	No

Will patients, carers, the public or staff be affected by the policy/service?	Yes
If staff, how many/which groups will be affected?	

Protected characteristic	Any impact?	Comments
Age	NO	Positive impact as the policy aims to recognise diversity, promote inclusion and fair treatment for patients and staff
Disability	NO	
Gender reassignment	NO	
Marriage and civil partnership	NO	
Pregnancy and maternity	NO	
Race	NO	
Religion or belief	NO	
Sex	NO	
Sexual orientation	NO	

What consultation method(s) have you carried out?
emails
How are the changes/amendments to the policies/services communicated?
emails
What future actions need to be taken to overcome any barriers or discrimination?

What?	Who will lead this?	Date of completion	Resources needed

Review date of EqIA	

Appendix1: Obstetric Anaesthetists' Association and Difficult Airway Society Recommended difficult airway routine and equipment for the obstetric operating theatre

- This list is designed to complement the OAA/DAS guidelines for the management of difficult and failed tracheal intubation in obstetrics
- This list includes equipment that should be available for routine airway management as well as unanticipated difficult airway management
- It is recommended that difficult airway equipment should be stocked in a dedicated difficult airway trolley, the layout and content of which should be standard throughout the hospital. This will mean that in airway emergency, the anaesthetist will know exactly what to find in what drawer and more importantly, should be familiar and know how to use the particular piece of equipment
- The trolley should be checked and stocked daily
- All anaesthetists and anaesthetic assistants should be familiar with the contents and location of the trolley(s), and this should form part of the induction programmed for all new staff
- Training should be provided in the use of equipment that has been stocked

Routine airway equipment

- Face masks
- Oropharyngeal airways size 2,3 and 4
- Endotracheal tubes in a range of sizes
- Laryngoscopes
  - Macintosh blades (size 3 and 4)
  - Two working short handles
  - McCoy laryngoscopes (size 3 and 4 blade)
  - Video-laryngoscopes (at least one type)
- Tracheal tube introducer- such as gum elastic bougie
- Malleable stylet
- Magill forceps
- Nasal cannula and oxygen tubing
- AIRVO-variable oxygen delivery device
- THRIVE- 100% O2delivery system for preoxygenation and apneic oxygenation
- Equipment for ramping/pillows (e.g. Oxford pillow)
- Monitoring equipment including capnography (see AAGBI guidelines- Recommendations for standards of monitoring during anaesthesia and recovery, 4th edition 2007)

Recommended equipment for the management of unanticipated difficult intubation

- Tracheal tubes- range of reinforced tubes, microlaryngeal tubes size 5.0 and 6.0 mm, LMA-Fastrach™ tracheal tubes
- Supraglottic airway devices (SAD) to include cLMA, second generation SAD (e.g.LMA ProSeal™ ,LMA Supreme™ or I-gel® - size 3,4,5
- LMA cuff pressure manometer
- Fiberoptic scope, camera and monitor
- Aintree® intubating catheter
- Surgical cricothyroidotomy equipment for the "can't intubate, can't oxygenate" situation
- Scalpel with No 10 blade
- Bougie
- Size 6.0 endotracheal tube
- Tracheal hook
- Forceps or tracheal dilator
- Equipment for awake fiberoptic intubation:
  - Equipment to deliver topical atomised local anaesthetic to the upper airway such as the Mucosal Atomization Device (MAD®) or Mackenzie technique set
  - Berman airway
  - Epidural catheter
  - Local anaestetic for topical anaesthesia (4% lidocaine, Instillagel®)
  - Vasoconstrictors for the nose-phenylephrine/lidocaine (Co-phenylcaine) or Xylometazoline

**Modified from the Difficult Airway Society equipment list*