Failed Adult Intubation in Obstetrics

Guideline for Management

University Hospitals of Leicester NHS Trust

C41/2011

Contents

1. Introduction and Who Guideline applies to

Failed intubation is the failure to pass an endotracheal tube into the trachea following induction of a general anaesthetic. Failed intubation is encountered almost 10 times more often in the obstetric population (1:390 compared with 1:3000 in the non-pregnant population).

Causes of failed intubation in obstetrics:

- Increased pharyngeal and laryngeal vascularity and oedema
- Large breasts
- Incorrectly applied cricoid pressure
- Co-morbidities such as obesity
- Situational factors such as urgency of surgery and remote site of the labour ward
- Inexperience of anaesthetist and ODP
- Human factors and fixation errors
- The need for rapid sequence induction
- Reduced functional residual capacity and reduced safe apnoea time

This document sets out the procedures and processes to follow in the event of a failed adult intubation in obstetrics with the intention of providing safe and effective care to this patient group.

These guidelines are for the use of all staff involved in the management of failed intubation in obstetrics. This includes midwifery, obstetric, anaesthetic and theatre staff.

Related documents

- Cardiopulmonary Resuscitation Policy UHL LLR Alliance LPT Trust ref: E4/2015
- Enhanced Maternity Care UHL Obstetric Guideline Trust ref: B47/2011
- Fetal Monitoring in Labour UHL Obstetric Guideline Trust ref: C23/2021
- Incident and Accident Reporting UHL Policy Trust ref: A10/2002
- Last Offices Care of the Deceased UHL Policy Trust ref: B28/2010
- Maternal Death UHL Obstetric Guideline Trust ref: C2/2007
- Maternity Records Documentation UHL Obstetric Policy Trust ref: C23/2016
- Patient Health Records - Documenting UHL Policy Trust ref: B30/2006
- Resuscitation at Birth UHL Neonatal Guideline Trust ref: B35/2008
- Safer Surgery UHL Policy Trust ref: B40/2012
- Surgical Swabs Instruments Needles and Accountable Items UHL Policy Trust ref: B35/2007

2. Guideline recommendations

Measures should be put in place to reduce the incidence of failed intubation

- High risk patients should be referred to antenatal anaesthetic clinics for planning the management strategy.
- Attendance at delivery suite wardrounds: Be aware of patients who may be potentially difficult to intubate so that a plan can be put in place such as an early working epidural.
- Carry out airway assessment whenever possible.
- Avoid general anaesthesia if possible and consider intrauterine fetal resuscitation where appropriate.
- Carry out WHO check list and communicate any concerns with the team.
- Communicate with senior colleagues if airway problems are anticipated.
- Attain optimum position for direct laryngoscopy before attempting intubation.
- Know your intubation equipment – Do not use unfamiliar equipment in a failed intubation situation.
- Use appropriate induction agents and muscle relaxants.
- Have a trained assistant to apply cricoid pressure. **Incorrectly applied cricoid pressure is a common cause of a difficult or failed intubation.**
- Make sure you are trained in basic and advanced airway skills.
- Follow the OAA/ DAS safe obstetric general anaesthetic algorithm (Algorithm 1)

The OAA DAS Obstetric difficult airway guidelines should be followed if intubation is difficult or if failed intubation occurs

The OAA & DAS published the first national obstetric failed intubation guidelines in 2015, which address all the airway related issues specific to pregnant women. It consists of 4 algorithms and 2 tables. Algorithm 2 & 3 provide guidelines on management of patients with failed tracheal intubation and can't intubate, can't oxygenate scenario.

2.1 Safe obstetric GA

Algorithm 1 gives guidance on how to administer a safe obstetric general anaesthetic. The guideline concentrates on pre-theatre preparation and team planning, using WHO safety checklist and planning for wake or proceed if there is an airway issue. Therefore it is important to create awareness among the team members of a potential problem that could arise.

Before giving a GA:

- Consider what you will do if you fail to intubate the patient. Are you going to proceed with the operation OR are you going to wake the patient up?

- The answer depends on several factiors which are listed in Table 1 of the OAA DAS obstetric difficult airway guidelines.

- This should ideally be discussed with the obstetricians and a combined decision by the obstetrician and the anaesthetist should be made prior to giving a GA

- Table 1 from the guidelines should be followed

Table 1: Proceed with surgery?

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.

'*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 a****nd failed tracheal intubation in obstetrics.*
Anaesthesia 2015; 70: 1286 – 1306, with permission from Obstetric Anaesthetists' Association / Difficult Airway Society'

- Preparation for rapid sequence induction including equipment, optimal positioning and preoxygenation are vital.

- Head up position should be used in all GAs and the ramping pillow is recommended in obese women.

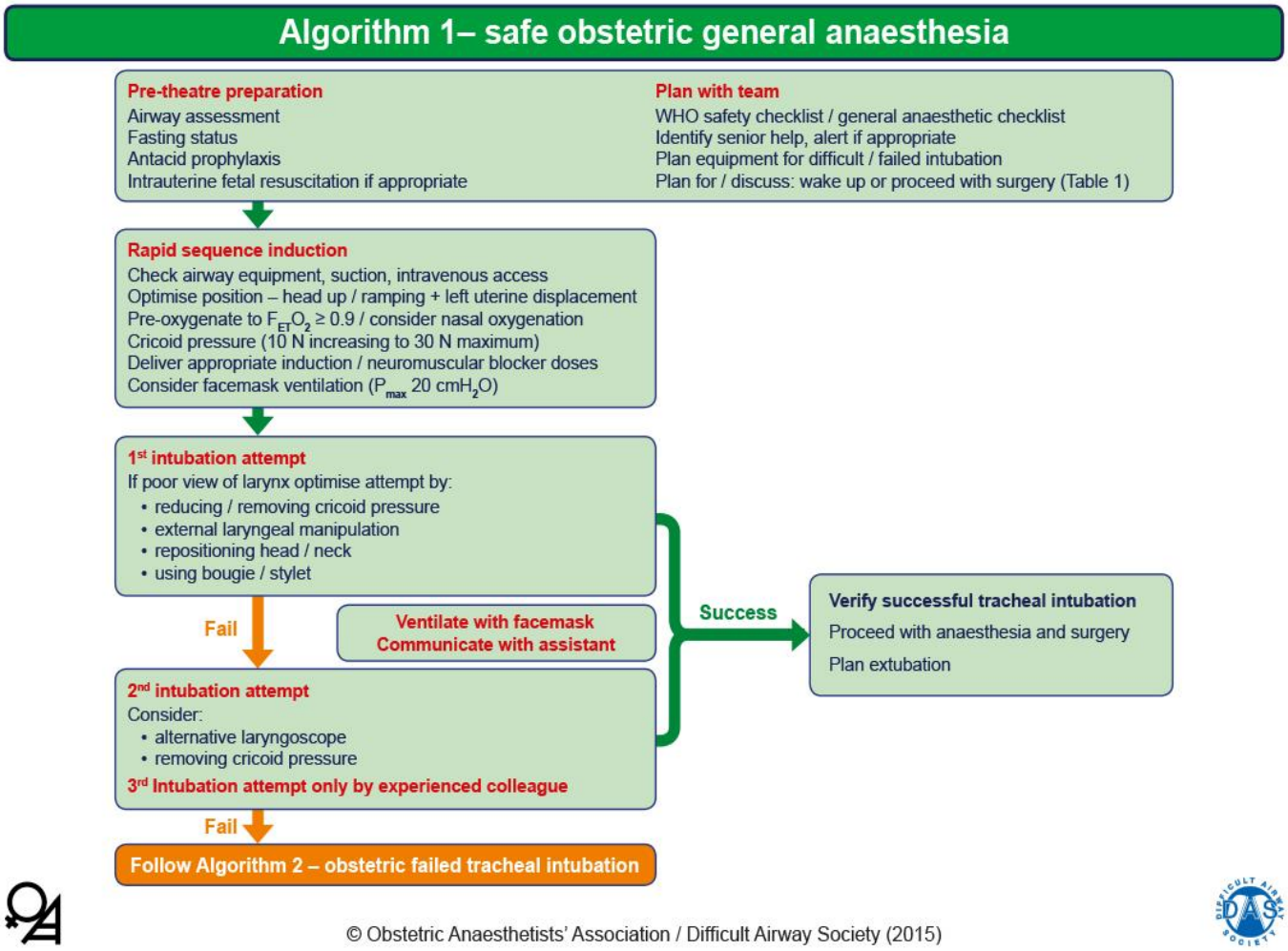
- Pre-oxygenate the woman with 15L min^{-1} using a face mask to an end-tidal oxygen concentration of 0.9 together with administration of oxygen via nasal cannullae 5 L min^{-1} during pre-oxygenation and 15L min^{-1} after induction of general anaesthesia and during apnoea. Alternatively, high flow humidified nasal oxygen (50-70L min^{-1}) can be used for pre-oxygenation and apnoeic oxygenation.

- Propofol is now the preferred induction agent, although thiopentone can still be used if indicated. Give correct dose of induction agent and muscle relaxant (suxamethonium or rocuronium). If rocuronium is used as the muscle relaxant, ensure that sugammadex is available and a precalculated dose is readily available. Have a second syringe of propofol in case additional induction agent is required to avoid awareness in cases of an unexpected difficult airway and a second syringe of suxamethonium (if using suxamethonium) in case the contents of the first syringe are accidentally lost.

- Gentle facemask ventilation (peak airway pressure of <20cm H_2O) following administration of induction agent and neuromuscular blocker, and with correctly applied cricoid force will help to prolong safe apnoea time if high flow humidified oxygen is not being used at the time of induction. Gentle mask ventilation should not be used together with high flow humidified nasal oxygen.

- It is important to select an appropriate laryngoscope including a video-laryngoscope for either the first or second intubation attempt. Airway problems should be communicated after the first failure to intubate. A maximum of two attempts at intubation are permitted and a third attempt should be only in a situation whereby an experienced anaesthetist arrives after a trainee has had two attempts already. Multiple attempts at intubation can lead to airway trauma and airway swelling. If the initial laryngoscopy view is not optimal, cricoid force should be released or reduced to try to improve the view.

Algorithm1: safe obstetric general anaesthesia



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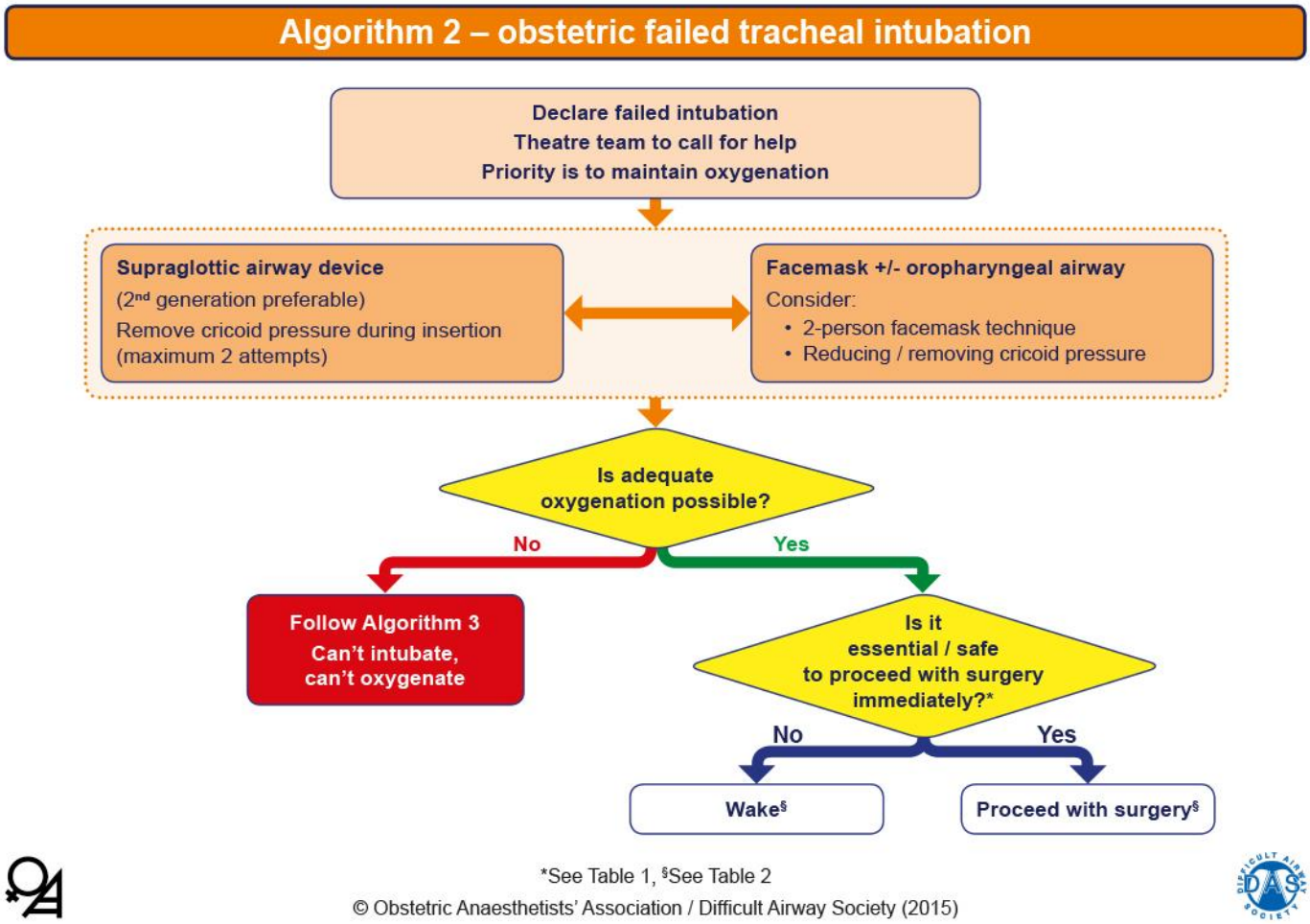
2.2 Failed intubation

Failed intubation should be declared after two unsuccessful attempts at tracheal intubation and help should be summoned. Attention should be paid to oxygenation at this stage and this can be achieved by using either second generation supraglottic airway device (in UHL this would be an I-gel) or using a facemask (Algorithm 2). A maximum of two attempts must be made at inserting supraglottic device to reduce the risk of airway trauma. Cricoid force should be released to facilitate the placement of supraglottic airway device successfully. If face mask is used to oxygenate the woman following a failed intubation, cricoid force may need to be released and two hands face mask ventilation used if there is difficulty in face mask ventilation.

Algorithm 2: obstetric failed tracheal intubation



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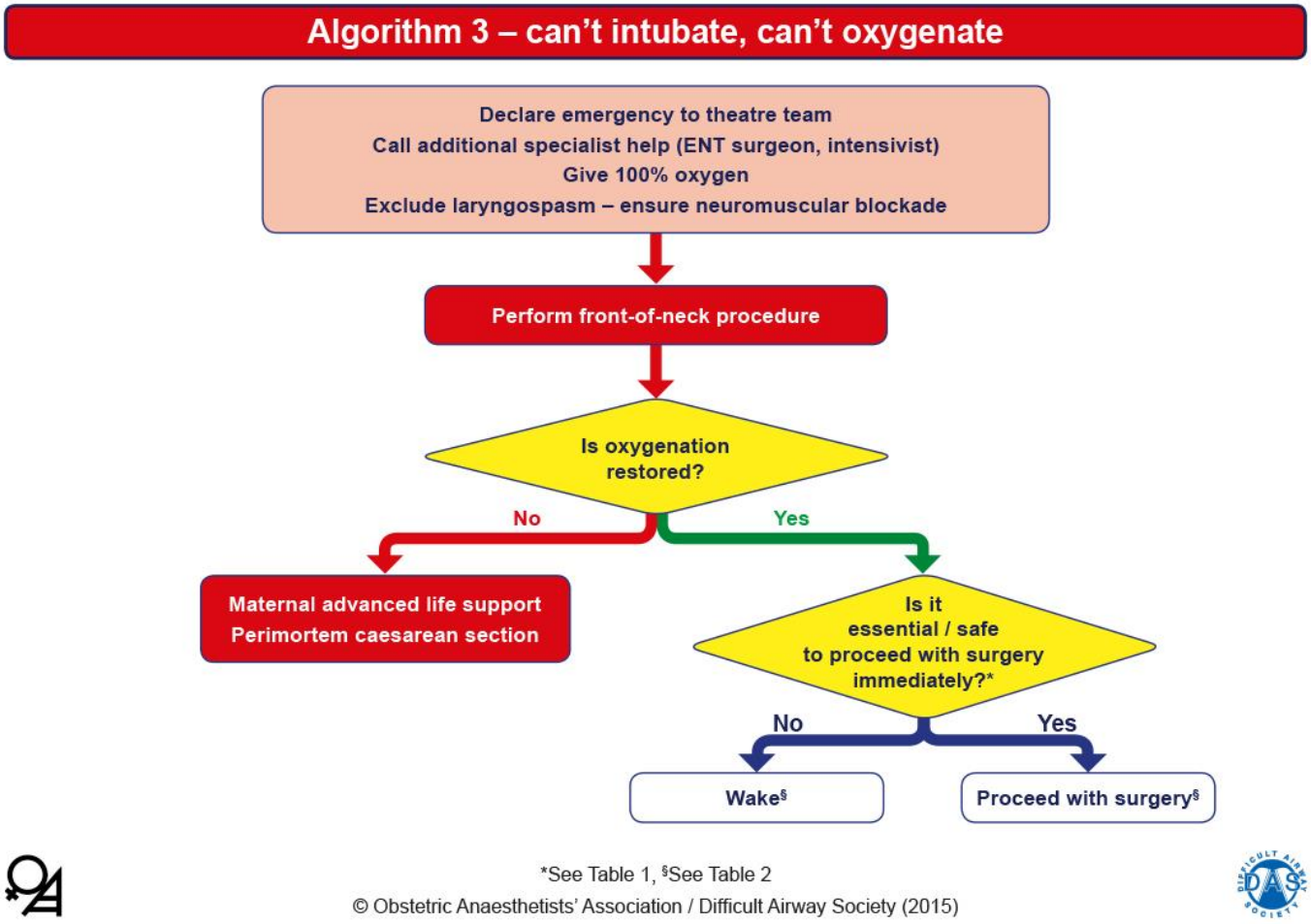
2.3 Can't Intubate, Can't oxygenate

If oxygenation is impossible despite attempts with either the use of a supraglottic airway device or face mask ventilation, a can't intubate, can't oxygenate scenario should be declared.

Algorithm 3 gives an outline of the management of the can't intubate can't oxygenate situation. ENT and ITU team must be called for help. Administration of 100% oxygen must be continued. Laryngospasm must be excluded at this stage by administering a neuromuscular blockade (if suxamethonium was the initial choice of muscle relaxant).

Algorithm 3: Can't intubate, can't oxygenate



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The DAS 2015 failed intubation guidelines recommend the scalpel, bougie and endotracheal tube cricothyroidotomy as the Front-of-Neck (FON) procedure (in the figure below)

2.4 Failed intubation, failed oxygenation in the paralysed, anaesthetised patient

Failed intubation, failed oxygenation in the paralysed, anaesthetised patient

Call for help

Continue 100% O2
Declare CICO

Plan D: Emergency front of neck access

Continue to give oxygen via upper airway
Ensure neuromuscular blockade
Position patient to extend neck

Scalpel cricothyroidotomy

Equipment: 1. Scalpel (number 10 blade)
2. Bougie
3. Tube (cuffed 6.0mm ID)

Laryngeal handshake to identify cricothyroid membrane

Palpable cricothyroid membrane
Transverse stab incision through cricothyroid membrane
Turn blade through 90" (sharp edge caudally)
Slide coude tip of bougie along blade into trachea
Railroad lubricated 6.0mm cuffed tracheal tube into trachea
Ventilate, inflate cuff and confirm position with capnography
Secure tube

Impalpable cricothyroid membrane
Make an 8-10cm vertical skin incision, caudad to cephalad
Use blunt dissection with fingers of both hands to separate tissues
Identify and stabilise the larynx
Proceed with technique for palpable cricothyroid membrane as above

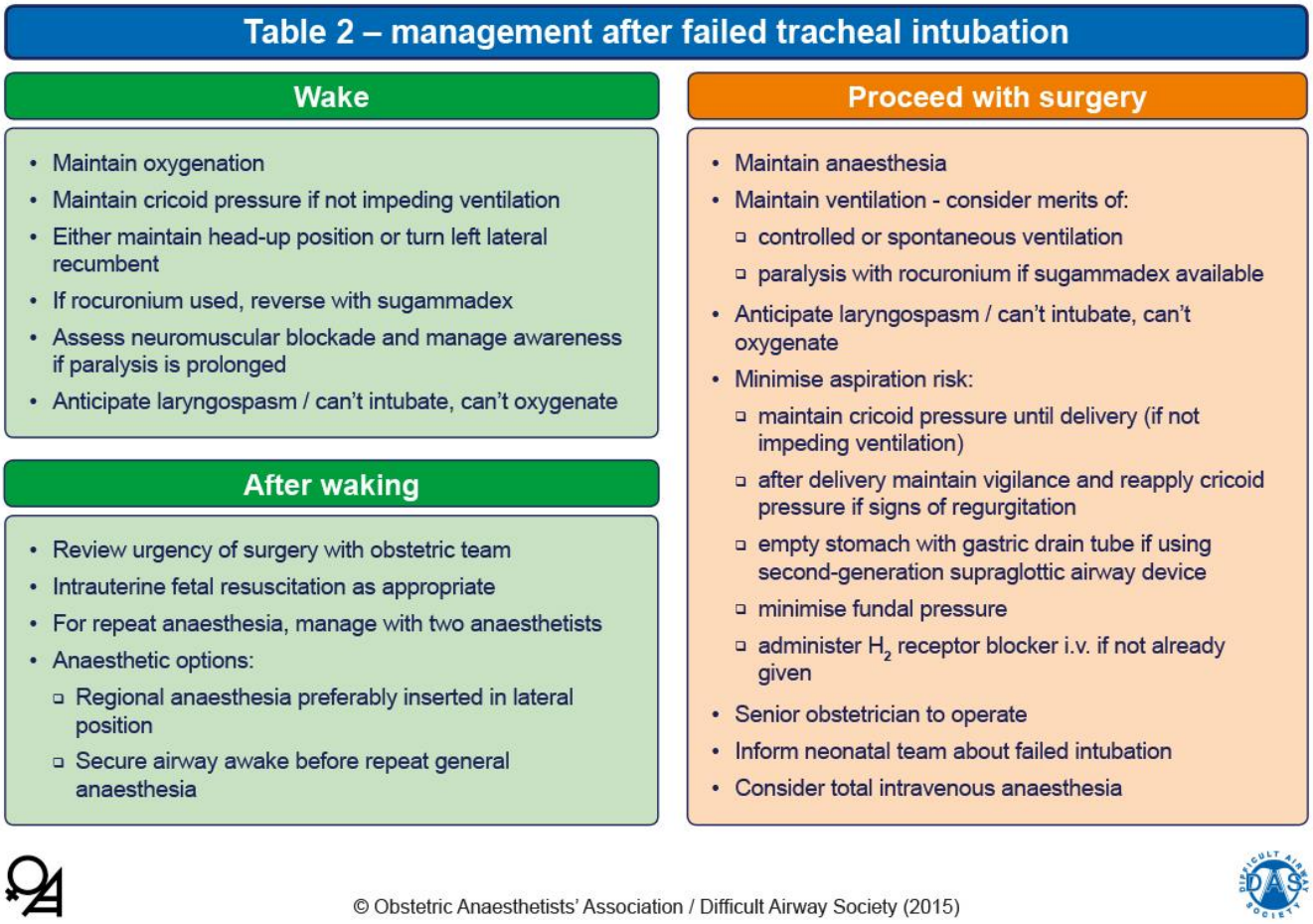
Post –operative care and follow-up
Postpone surgery unless immediately life-threatening
Urgent surgical review of the cricothyroidotomy site
Document and follow up as in main flow chart

This flow chart forms part of the DAS Guideline for unanticipated difficult intubation in adults 2015 and should be used in conjunction with the text

2.5 Management after Failed intubation

COMBINED OBSTETRICIAN AND ANAESTHETIC PLAN is necessary for the decision to proceed with surgery or to abandon surgery after failed intubation. The discussion should have been considered prior to giving a GA as stated above but once a failed intubation has occurred, Table 1 should be referred to once more to make the final decision of whether to wake or proceed.

Table 2: Management of either waking the mother or proceeding with surgery following failed intubation.



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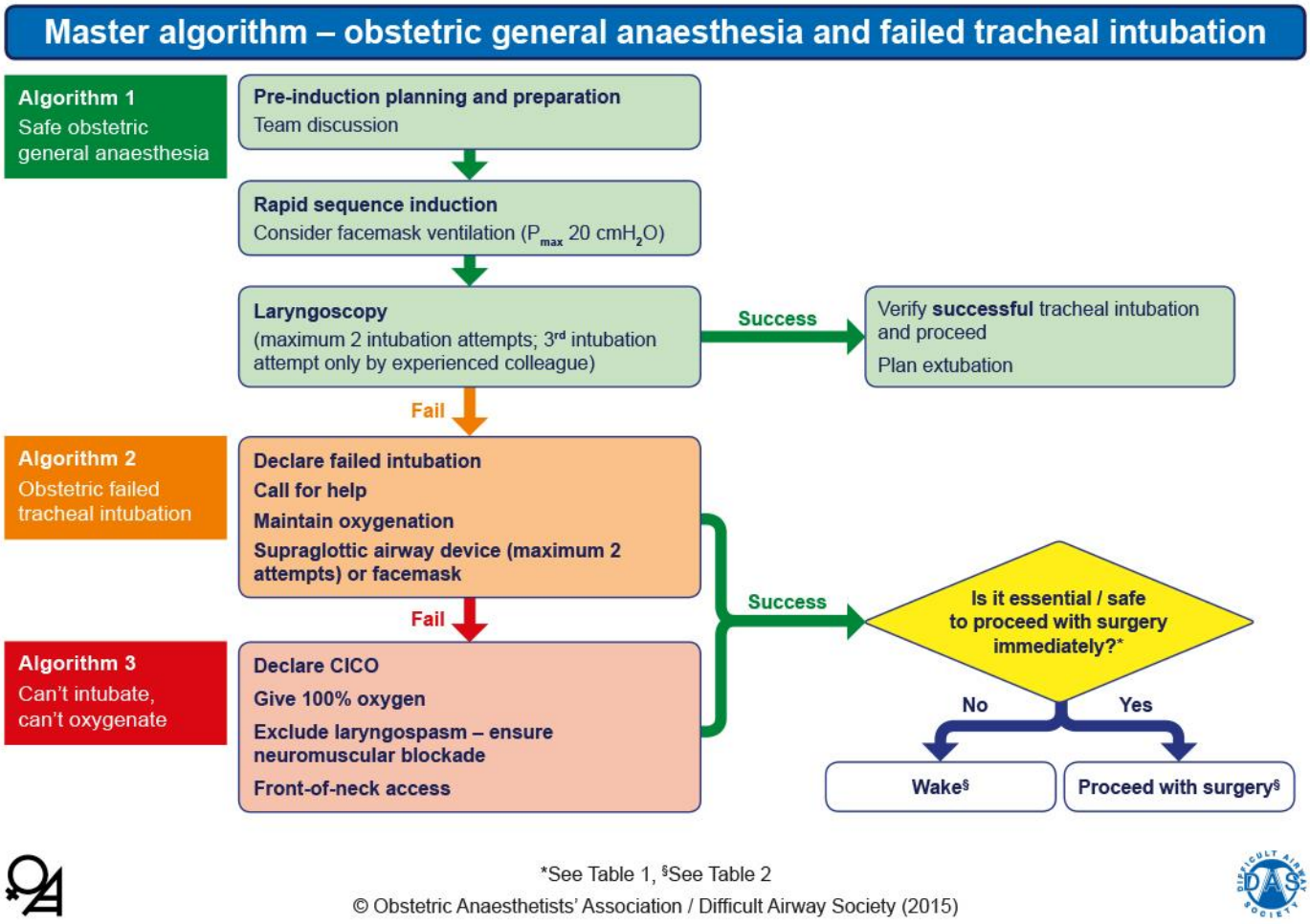
Master Algorithm: a summary of all three algorithms and the two tables.



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Following a failed intubation, a datix form should be completed. The woman should be seen by an anaesthetist before she is discharged home and she should be booked to be seen in the obstetric anaesthetic clinic for follow up and debriefing.

3. Education and Training

Multi-disciplinary training is vital to highlight awareness of the seriousness of failed intubation, for allied health professionals to understand the issues arising, and to be able to help with patient management in such a scenario.
Human factors have been shown to contribute to failed intubation scenarios, including situational awareness, job factors and person factors. Human factors training can help mitigate these pressures and increase awareness of the role human factors play in emergency scenarios such as failed intubation.

4. Monitoring Compliance

What will be measured to monitor compliance	How will compliance be monitored	Monitoring Lead	Frequency	Reporting arrangements
Failed intubation rate in obstetrics in UHL	Record of number of failed intubations in Obstetrics in UHL	Obstetric anaesthetic leads at LRI and LGH	Annually	Via Datix and at MDT presentations

5. Supporting References

1. Mushambi MC, Kinsella SM, Popat M, et al. Obstetric Anaesthetists' Association and Difficult Airway Society guidelines for the management of difficult and failed tracheal intubation in obstetrics. Anaesthesia 2015; 70:1286-306.
2. Kinsella SM, Winton AL, Mushambi MC et al Failed tracheal intubation during obstetric general anaesthesia: a literature review. Int J Obstet Anesth 2015; 24:356–374.
3. Frerk C, Mitchell VS, McNarry AF et al. Difficult Airway Society 2015 guidelines for management of unanticipated difficult intubation in adults. Brit J Anaesth 2015; 115: 827-48.
4. Flin R, Fioratu, Frerk C, Trotter C, Cook TM. Human factors in the development of complications of airway management: preliminary evaluation of an interview tool. Anaesthesia 2013:68; 817-825

6. Key Words

Difficult intubation, failed intubation, pregnant woman

The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs.
As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.

Contact and review details			
Guideline Lead (Name and Title) M C Mushambi, Consultant Anaesthetist, UHL			**Executive Lead** Chief Medical Officer
Details of Changes made during review:			
Date	**Issue Number**	**Reviewed By**	**Description Of Changes (If Any)**
April 2022	**3**	M Mushambi G Knight, Consultant Anaesthetist, UHL	Update and more details on the pre-oxygenation techniques. Mention of post failed intubation follow up of the woman.