Final FRCA Teaching: The Airway

Umair Ansari

February 2022

UHCW

Learning Objectives

Difficult Airway

- Awake tracheal intubation
- Airway strategies inc Extubation

Major head and neck surgery

- Specific pathology

The difficult airway

Awake	Awake Tracheal Intubation
Awake	Awake VL
Awake	Awake fibreoptic intubation

What is a difficult airway?

A difficult airway can be defined as the clinical situation in which a conventionally trained anaesthetist experiences difficulty with face mask ventilation of the upper airway, difficulty with tracheal intubation, or both.

Difficult Mask Ventilation

Anesthesiology
2000; 92:1229–36

Prediction of Difficult Mask Ventilation

Olivier Langeron, M.D., Eva Masso, M.D.,† Catherine Huraux, M.D.,‡ Michel Guggiari, M.D.,‡ André Bianchi, M.D.,‡ Pierre Coriat, M.D.,§ Bruno Riou, M.D., Ph.D.‖*

Background: **Maintenance of airway patency and oxygenation are the main objectives of face-mask ventilation. Because the incidence of difficult mask ventilation (DMV) and the factors associated with it are not well known, we undertook this prospective study.**

Methods: **Difficult mask ventilation was defined as the inability of an unassisted anesthesiologist to maintain the measured oxygen saturation as measured by pulse oximetry > 92% or to prevent or reverse signs of inadequate ventilation during positive-pressure mask ventilation under general anesthesia. A univariate analysis was performed to identify potential factors predicting DMV, followed by a multivariate analysis, and odds ratio and 95% confidence interval were calculated.**

Results: **A total of 1,502 patients were prospectively included. DMV was reported in 75 patients (5%; 95% confidence interval, 3.9–6.1%), with one case of impossible ventilation. DMV was anticipated by the anesthesiologist in only 13 patients (17% of the DMV cases). Body mass index, age, macroglossia, beard, lack of teeth, history of snoring, increased Mallampati grade, and lower thyromental distance were identified in the univariate analysis as potential DMV risk factors. Using a multivariate analysis, five criteria were recognized as independent factors for a DMV (age older than 55 yr, body mass index > 26 kg/m^2, beard, lack of teeth, history of snoring), the presence of two indicating high likelihood of DMV (sensitivity, 0.72; specificity, 0.73).**

Conclusion: **In a general adult population, DMV was reported in 5% of the patients. A simple DMV risk score was established. Being able to more accurately predict DMV may improve the safety of airway management. (Key words: Airway management; anesthesia complication; anesthesia risk; difficult intubation.)**

DIFFICULTIES or failure in managing the airway are the major factors underlying morbidity and mortality related to anesthesia.[1] To facilitate the management of the difficult airway and to reduce the incidence of severe adverse outcomes during airway management, practice guidelines have been established,[2–4] and several algorithms have been developed. One component of many such algorithms is the preoperative assessment and recognition of the difficult airway.[2–4] Prediction is mainly based on factors associated with difficult tracheal intubation, such as mouth opening, Mallampati classification, head and neck movement (atlantooccipital joint

DIFFMASK Study

Anaesthesia 2019, 74, 1267-1276 doi:10.1111/anae.14701

Original Article

The DIFFMASK score for predicting difficult facemask ventilation: a cohort study of 46,804 patients

L. H. Lundstrøm,[1] **C. V. Rosenstock,**[1] **J. Wetterslev**[2] and **A. K. Nørskov**[3,4]

1 Consultant and Associate Professor, 3 Resident, Department of Anaesthesiology and Intensive Care, Nordsjællands Hospital, Hillerød, Denmark
2 Chief Physician, 4 Resident, Copenhagen Trial Unit, Centre for Clinical Intervention Research, Rigshospitalet, Copenhagen University Hospital, Copenhagen, Denmark

Summary

Facemask ventilation is an essential part of airway management. Correctly predicting difficulties in facemask ventilation may reduce the risk of morbidity and mortality among patients at risk. We aimed to develop and evaluate a weighted risk score for predicting difficult facemask ventilation during anaesthesia. We analysed a cohort of 46,804 adult patients who were assessed pre-operatively airway for 13 predictors of difficult airway management and subsequently underwent facemask ventilation during general anaesthesia. We developed the Difficult Facemask (DIFFMASK) score in two consecutive steps: first, a multivariate regression analysis was performed; and second, the regression coefficients of the adjusted regression model were converted into a clinically applicable weighted point score. The predictive accuracy of the DIFFMASK score was evaluated by assessment of receiver operating characteristic curves. The prevalence of difficult facemask ventilation was 1.06% (95%CI 0.97–1.16). Following conversion of regression coefficients into 0, 1, 2 or 3 points, the cumulated DIFFMASK score ranged from 0 to 18 points and the area under the receiver operating characteristic curve was 0.82. The Youden index indicated a sum score ≥ 5 as an optimal cut-off value for prediction of difficult facemask ventilation giving a sensitivity of 85% and specificity of 59%. The DIFFMASK score indicated that a score of 6–10 points represents a population of patients who may require heightened attention when facemask ventilation is planned, compared with those patients who are obviously at a high- or low risk of difficulties. The DIFFMASK score may be useful in a clinical context but external, prospective validation is needed.

DIFFMASK Study

Table 1 List of risk factors for difficult airway management in patients who underwent attempts at facemask ventilation.

Risk factor	Categories	Description of how the risk factor was evaluated
Sex	Female Male	
Age; years	15–44 45–59 60–80 > 80	
Body mass index; $kg.m^{-2}$	< 25 25–35 ≥ 35	Based on medical records or the patient's own information
Mouth opening; cm	≥ 4 < 4	In patients with incisors the distance between the teeth was measured at maximum mouth opening. In edentulous patients the intergingivale distance was measured at maximum mouth opening
Ability to extend lower jaw	Yes No	The capacity to bring the lower incisors in front of the upper incisors. Edentulous patients are categorised as 'Yes'
Previous difficult tracheal intubation	No Possible Yes, certain	
Thyromental distance; cm	> 6.5 6.0–6.5 < 6.0	The distance was measured along a straight line from the prominentia laryngea of cartilago thyroidea to the notch of mentum mandibulae with maximum head extension
Modified Mallampati score	1/2 3 4	The visibility of the oropharyngeal structures is assessed on the patient sitting in neutral position with maximum mouth opening and tongue protrusion without phonation
Full beard	No Yes	Moustache, goatee or beard stubbles were categorised as 'No'
Snoring	No Yes	
Sleep apnoea	No Yes	History of obstructive sleep apnoea that requires CPAP, BiPAP or surgery
Neck radiation changes	No Yes	
Neck movement; degrees	> 90 80–90 < 80	The range of motion from full extension through full flexion

CPAP, continuous positive airway pressure, BiPAP, bilevel positive airway pressure.

Causes of Difficult Airway

- Distortion of normal anatomy
- Oedema
- Haematoma
- Swelling
- Muscle tone
- Foreign bodies
- Fractures
- Aspiration

Planning and implementing safe management of the patient with an anticipated difficult airway

Canadian Airway Focus Group updated consensus-based recommendations for management of the difficult airway: part 2.

Table 2 Published predictors of difficult tracheal intubation using video laryngoscopy

Predictors of difficulty with tracheal intubation using video laryngoscopy[32-36]
• Abnormal neck anatomy (e.g., due to pathology, scar, remote radiation); thick neck
• Male sex
• Large tongue
• Thyromental distance < 6 cm
• Short sternothyroid distance
• Limited cervical spine motion
• Limited mouth opening
• High upper lip bite test/limited mandibular protrusion
• Upper airway soiled by blood or vomitus
• Previously obtained high Cormack–Lehane grade during direct laryngoscopy
• Surgery type (head and neck or cardiac)
• Airway manager inexperience

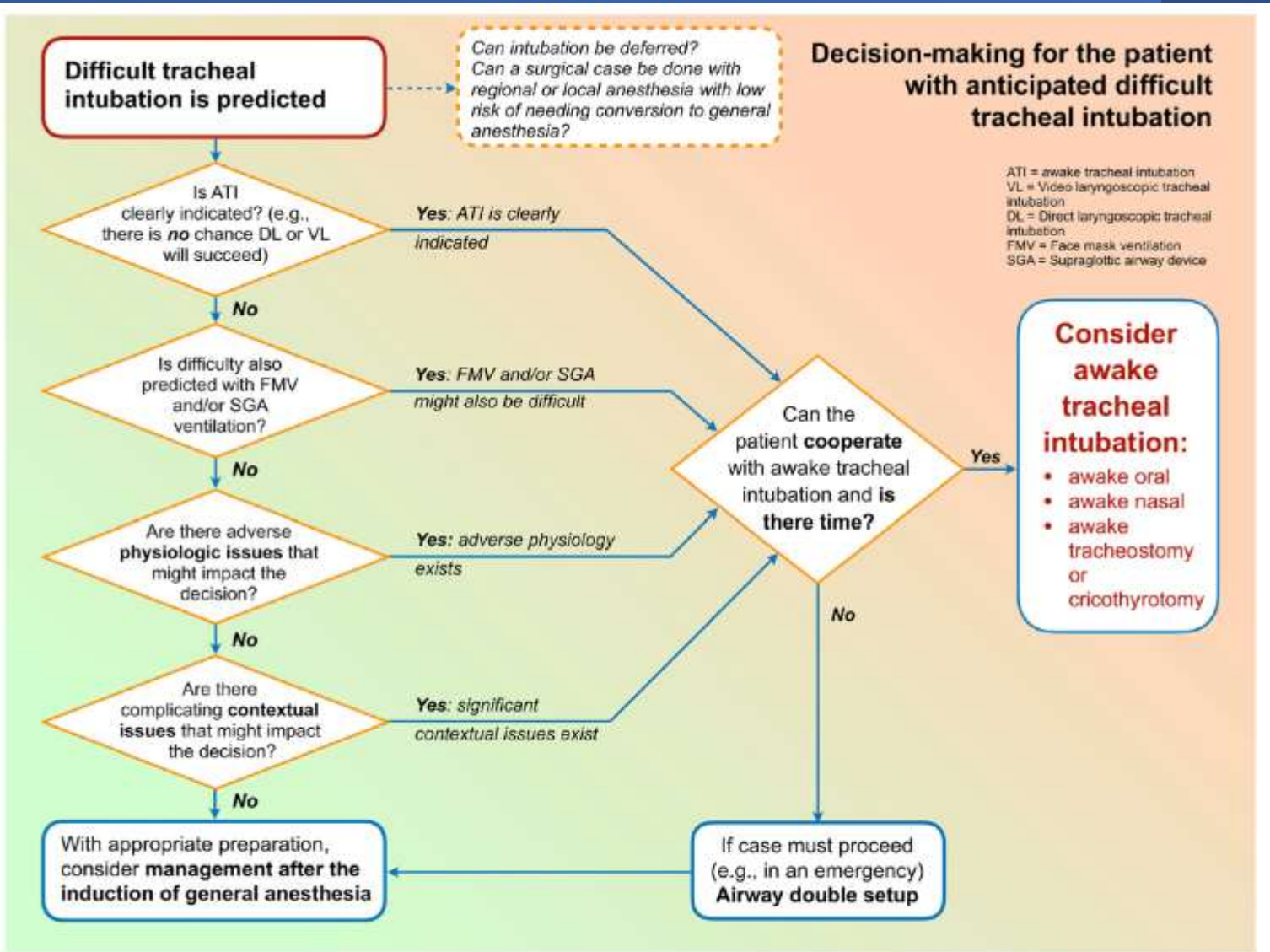


Fig. 1 Flow diagram: Decision-making when difficult tracheal intubation is predicted. ATI = awake tracheal intubation; DL = direct laryngoscopy; FMV = face-mask ventilation; SGA = supraglottic airway; VL = video laryngoscopy.

DAS ATI technique

OXYGENATE

- Apply HFNO early
- Titrate HFNO from 30–70 l.min^{-1}
- Continue HFNO throughout procedure

TOPICALISE

- Lidocaine 10% spray to oropharynx, tonsillar pillars, base of tongue
- 20 – 30 sprays (during inspiration, over 5 min)
- If nasal route: co-phenylcaine spray
- Test topicalisation atraumatically
- If inadequate, re-apply LA up to maximum dose:
  - Further 5 sprays of lidocaine 10% to tongue base
  - 2 ml lidocaine 2% (x 3) spray above, at and below vocal cords via epidural catheter/working channel of FB or using MAD

Lidocaine
- 1 spray (0.1 ml) of 10% = 10 mg
- 1 ml of 2% = 20 mg

Co-phenylcaine
- 2.5 ml = 125 mg lidocaine + 12.5 mg phenylephrine

PERFORM

- Select appropriate tracheal tube
- Patient sitting up
- Ensure operator can readily see patient monitor, infusion pumps and video screen
- Clear secretions
- For ATI:FB
  - Operator positioned facing patient
  - Consider bronchoscope airway if oral route
  - Bevel facing posteriorly
- For ATI:VL
  - Operator positioned behind patient
  - Consider bougie
- Before induction of anaesthesia: two-point check

SEDATE

- Sedate if required
- Remifentanil TCI (Minto) Ce 1.0–3.0 ng.ml^{-1}
- If second anaesthetist present, consider adding midazolam 0.5–1 mg

Awake Tracheal Intubation Cognitive Aid

NHS
University Hospitals Coventry and Warwickshire NHS Trust

PATIENT PREPARTAION

- ❑ Early oxygen delivery (consider HFNO)
- ❑ Allocation of roles
- ❑ Reliable IV access
- ❑ Optimised patient position
- ❑ Identify CTM

PREPERATION FOR FAILURE

- ❑ Second anaesthetist required?
- ❑ Who & how to contact if help required _____
- ❑ Verbalise Plan (ABCD)
  - Maximum attempts (3+1)

EQUIPMENT

- ❑ Optimised ergonomics
- ❑ Monitoring applied
- ❑ Scope/ETT/Suction/FONA Kit
- ❑ Sedation (if required)
- ❑ Emergency Drugs
- ❑ Plan for maintenance of anaesthesia

PROCEDURE

- ❑ Sedation check at
  - Pre topicalisation
  - Pre scope insertion
  - Pre ETT insertion
- ❑ Pre induction: Visualise tracheal lumen **AND** check capnography

Lean Body Weight:

(https://tinyurl.com/LBWUHCW)

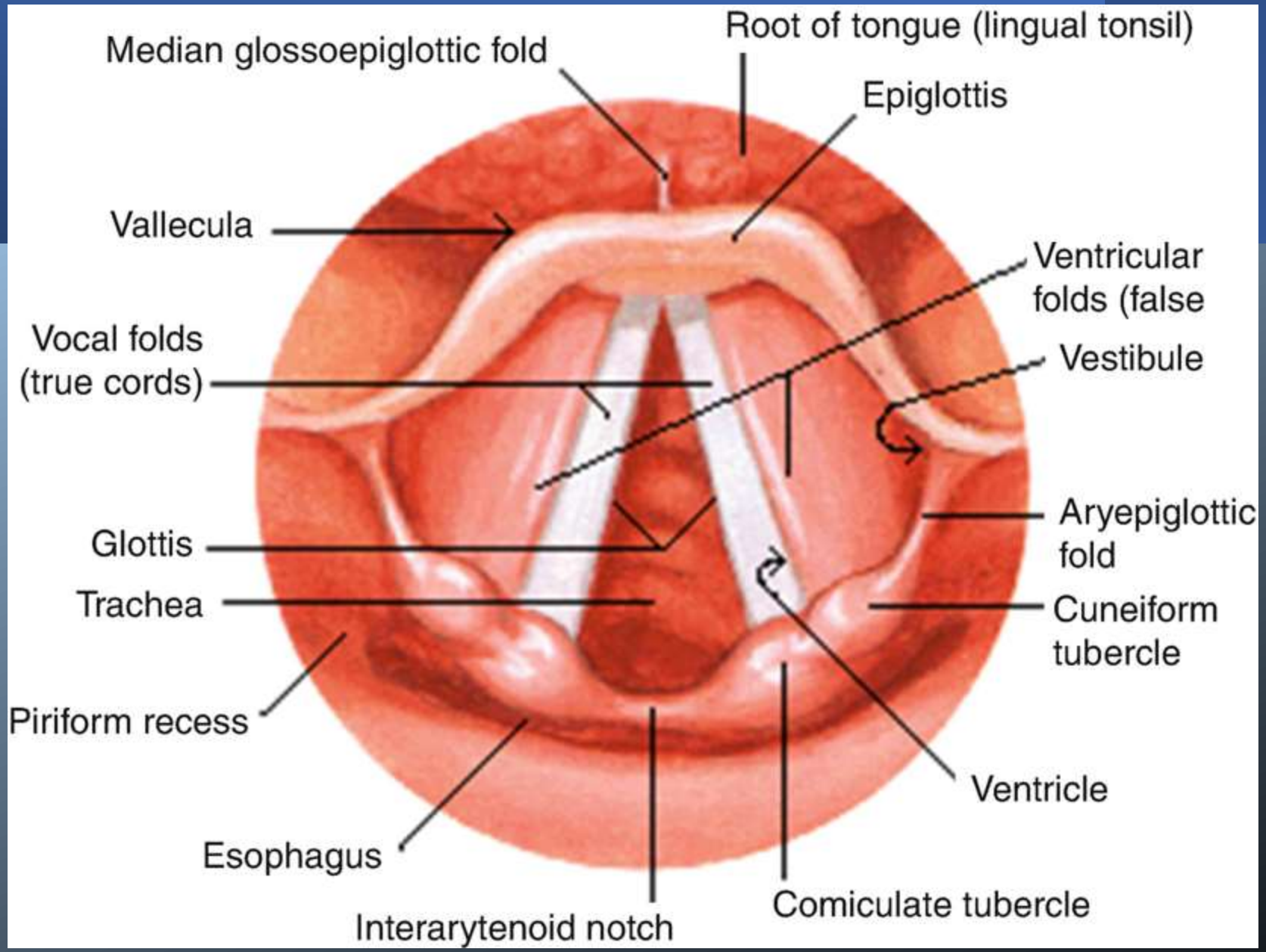
_____ Kg

Lidocaine **MAXIMUM** total dose (9mg/Kg LBW):

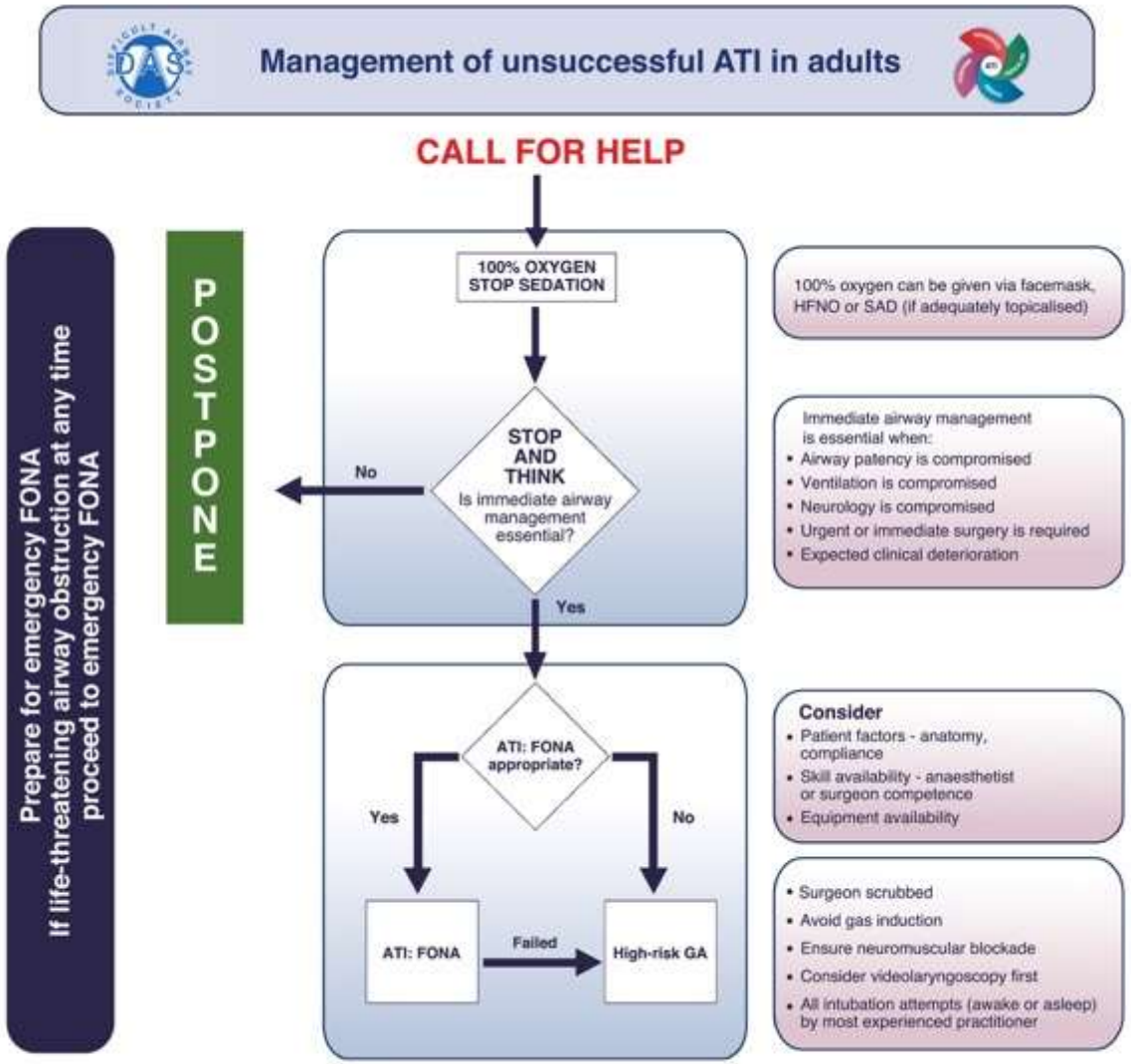
_____ mg

Co-Phenylcaine 2.5mls contains 125mg lidocaine

Videolaryngoscopy

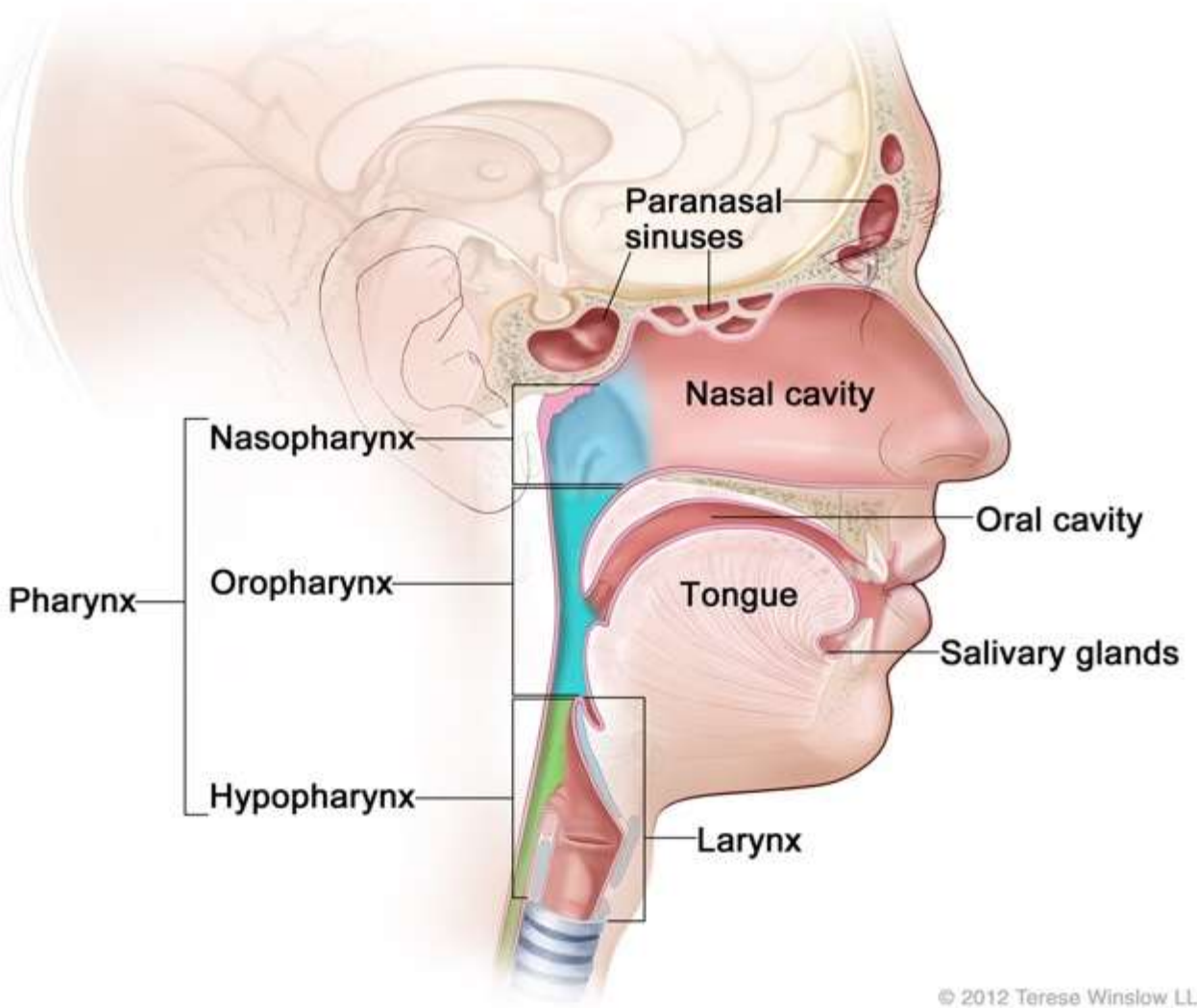

Median glossoepiglottic fold
Root of tongue (lingual tonsil)
Epiglottis
Vallecula
Ventricular folds (false
Vocal folds (true cords)
Vestibule
Glottis
Aryepiglottic fold
Trachea
Cuneiform tubercle
Piriform recess
Ventricle
Esophagus
Interarytenoid notch
Comiculate tubercle

Miller style laryngoscopy


Management of unsuccessful ATI in adults
CALL FOR HELP
Prepare for emergency FONA
If life-threatening airway obstruction at any time
proceed to emergency FONA
POSTPONE
100% OXYGEN
STOP SEDATION
STOP
AND
THINK
Is immediate airway
management
essential?
No
Yes
ATI: FONA
appropriate?
Yes
No
ATI: FONA
Failed
High-risk GA
100% oxygen can be given via facemask,
HFNO or SAD (if adequately topicalised)
Immediate airway management
is essential when:
• Airway patency is compromised
• Ventilation is compromised
• Neurology is compromised
• Urgent or immediate surgery is required
• Expected clinical deterioration
Consider
• Patient factors - anatomy,
compliance
• Skill availability - anaesthetist
or surgeon competence
• Equipment availability
• Surgeon scrubbed
• Avoid gas induction
• Ensure neuromuscular blockade
• Consider videolaryngoscopy first
• All intubation attempts (awake or asleep)
by most experienced practitioner

Major Head & Neck Surgery

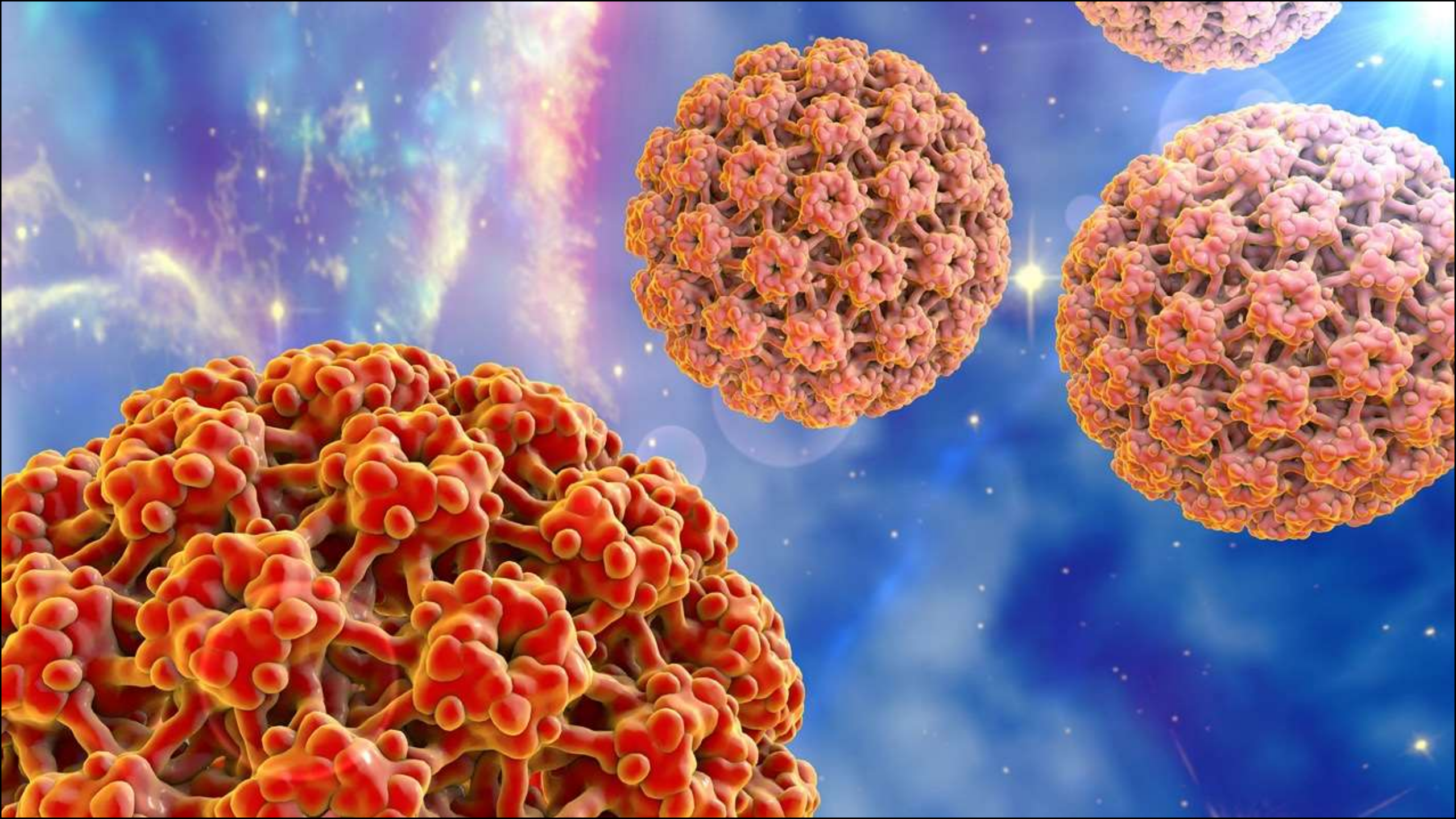
Head and Neck Cancer Regions




brother
BRIDGESTONE
INTERCOND
BRIDGESTONE
POTENZA
zepter
zepter
IRIDIUM
HONDA
MUGEN
BUZZIN
HORNETS
KEIHIN
prima
SIXT
Anglian Water
Deutsche Post
World Net
MasterCard
POTENZA
BRIDGESTONE
Deutsche Post


JOHNNIE WALKER
Red Label
JOHNNIE WALKER
BLACK LABEL
12
JOHNNIE WALKER
DOUBLE BLACK
JOHNNIE WALKER
GOLD LABEL
RESERVE
JOHNNIE WALKER
PLATINUM
LABEL
18
JOHNNIE WALKER
Blue Label


B&H
BENSON & HEDGES
GOLD
Smoking
seriously harms
you and others
around you



Pre-op Assessment

- Ideally all patients should be reviewed by a MDT
- Identify difficult airways, stratify the risks, treat co-morbidities, and optimize their physiology before major surgery.

The Difficult Airway

- Assessment
  - Difficulty in intubation
  - Feasibility of rescue plans
  - Airway Compromise
    - Changes to voice
    - Dysphagia
    - Orthopnoea
    - Recent onset of snoring
    - Beware the ‘fibrotic’ airway

Imaging the difficult airway

- Flexible naso-endoscopy
- Ultrasound
- Computed topography
- Magnetic resonance imaging

- Awake nasal endoscopy

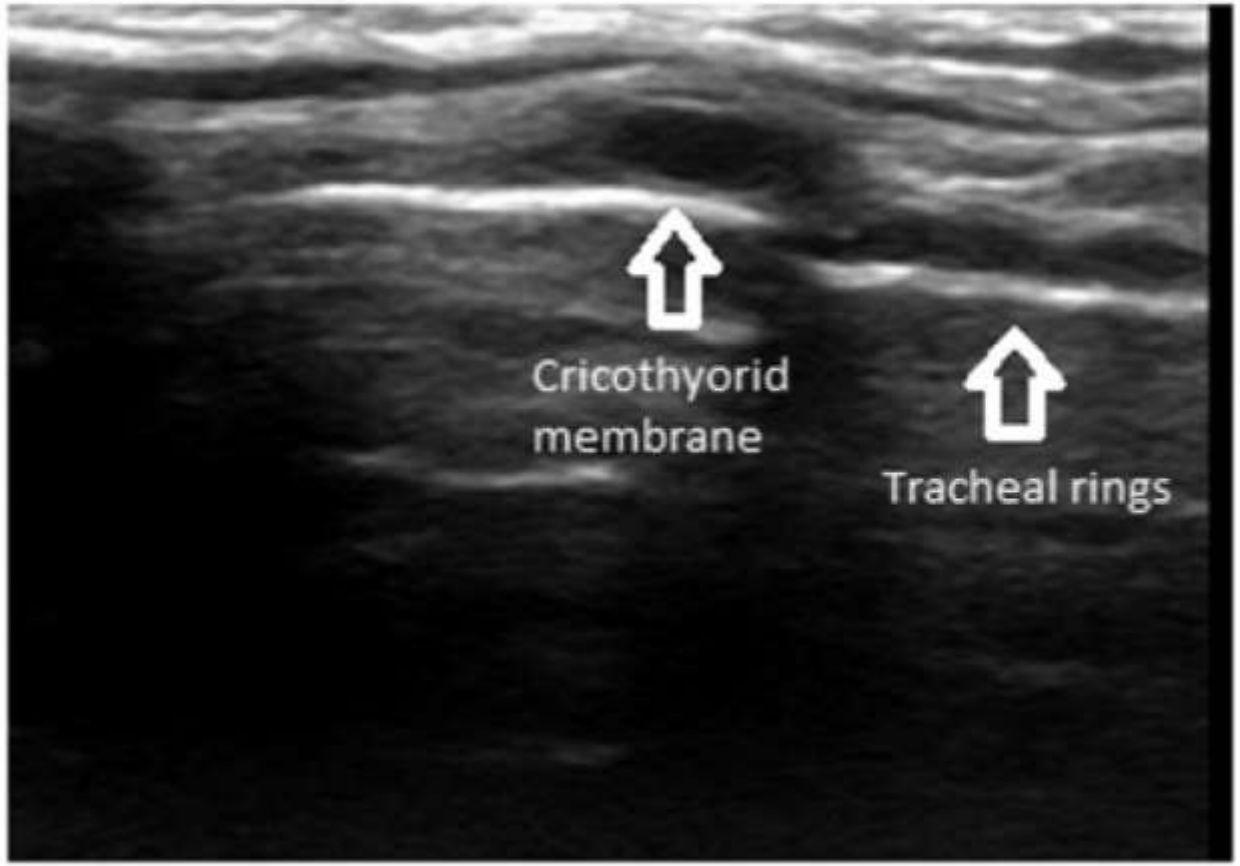


Fig 1 Parasagittal ultrasound of the neck showing tracheal rings (string of pearls) and the cricothyroid membrane.

Co-morbidities

Investigations

- COPD

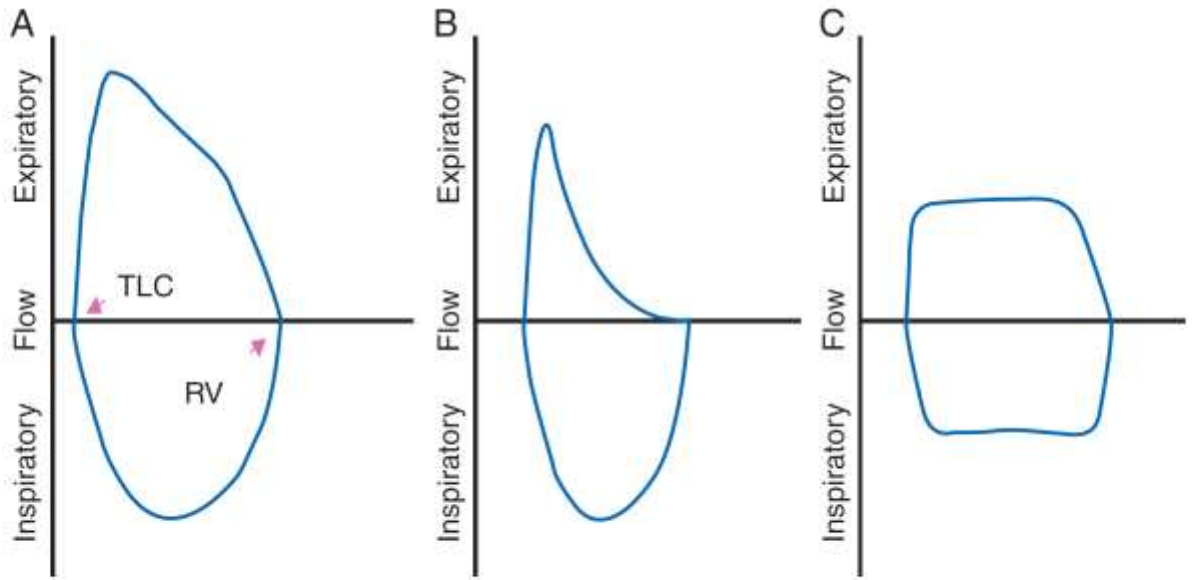


Fig 2 Flow volume loops: (A) normal inspiratory and expiratory limb, (B) the slowing and flattening of the expiratory limb in COPD, and (C) fixed upper airway obstruction showing plateaus in both the inspiratory and the expiratory limbs.

CPET Testing

- Right heart failure & Pulmonary hypertension – non-surgical treatment

Malnutrition

- Poor wound healing
- Infection
- Increased risk of post-op complications

- Poor dietary habits (alcoholism)
- Dysphagia
- Cancer cachexia
- Chemo & radiotherapy mucositis

Dietician

- At presentation and during their care
- BMI < 18.5
- Weight loss > 10% body weight

- Risk of refeeding syndrome is high

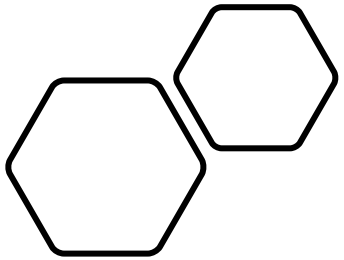
- Alcohol dependents – active in patient withdrawal treatment for 48 hrs

Quantitative Risk Prediction

Intermediate risk surgery

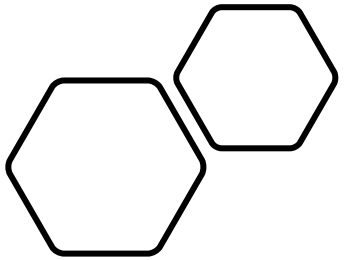
- 1-5% risk of 30-day cardiac event
- Use revised (Lee) cardiac risk index to predict cardiac risk

Anaesthetic Management



- Joint review of imaging with surgeons
- The case of a simple airway…

Airway Assessment



- Is face mask ventilation likely following induction of general anaesthesia?
- If laryngoscopy and intubation are likely to be difficult?
- If an awake technique is more appropriate?
- If emergency surgical airway and front of neck access (FONA) is feasible?

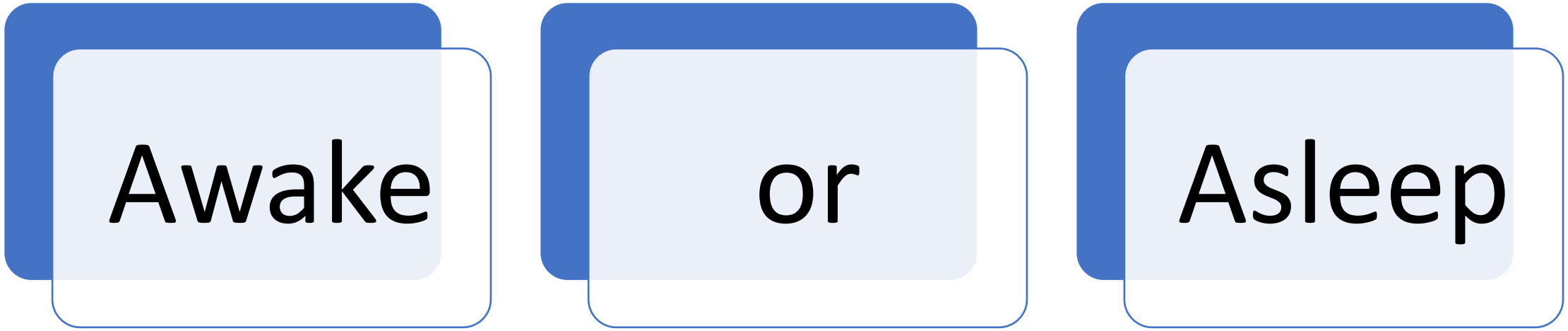
Reasons why the airway may not be simple…

Table 2 Sequelae of head and neck cancer treatment

Radiotherapy
Limited neck extension
Temperomandibular joint ankylosis
Osteoradionecrosis of mandible
Hypothyroidism
Baroreceptor damage
Carotid artery stenosis
Poor wound healing
Maxillectomy and craniofacial resection
Difficult mask seal
Nasal access difficult
Temporalis contracture
Temperomandibular joint pseudoankylosis
Tongue, floor of mouth surgery
Trismus
Fixed immobile tongue
Limited mandibular space
Increased tongue:oral cavity ratio with flap reconstruction
Laryngeal surgery
Laryngeal stenosis
Impaired swallowing
Aspiration risk
Neck dissection
Damage to IX, X, XII nerves
Impaired swallowing
Aspiration risk
Vocal cord palsy

Airway strategy

The first question…



- Invasive monitoring (CVC lines in femoral)
- Large bore cannula
- TIVA

The ‘ideal’ VL

Strategy: Extubation

Practicalities

- Shared airway
- Supine – head up position
- Goal directed fluid therapy
- Temp measurement (flap surgery aim gradient <1.5C)
- Analgesia

Specific considerations

Oral & Maxillofacial Cancers

- Maxilla, nose & paranasal sinuses – oral intubation
- Oral cancers – nasal intubation

- Submental intubation – absolute contraindication (orocutaneous fistula)

Free flap surgery

Parameters

Haematocrit – 30 – 35%

Inotropes – not ideal

Dobutamine – preferred (inodilator) but beware tachycardia

Perfusion dynamics

- Handling of flap leads to vasoconstriction
- Epinephrine infusion may help

Absolute contraindications:

- Sickle cell disease
- Untreated polycythaemia rubra vera (sludging)

How you can bring your transferable skills to head & neck….

Available online at www.sciencedirect.com
ScienceDirect
British Journal of Oral and Maxillofacial Surgery 59 (2021) 111–113
BRITISH Journal of Oral and Maxillofacial Surgery
www.bjoms.com

Short communication

Role of real-time colour-flow Doppler in perforator free flap head and neck reconstruction

Shofiq Islam *, Umair Ansari, Gary M. Walton

University Hospitals Coventry and Warwickshire NHS Trust, Clifford Bridge Rd, Coventry CV2 2DX

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Abstract

We discuss the use of real-time colour-flow Doppler ultrasound to optimally evaluate the vascular anatomy of patients receiving free perforator flap head and neck reconstruction. We explore the advantages of the technique and its role as a valuable adjunct for the planning and harvesting of perforator flaps.

Keywords: Real-time; colour-flow Doppler; ultrasound; perforator flap; head and neck surgery; reconstruction; free tissue transfer

Introduction

In contemporary head and neck reconstructive practice, perforator free flaps rightly form an important part of the surgeon's armamentarium, as they offer great versatility and low donor-site morbidity to the benefit of individual patients. Important considerations are attendant to their use, such as the variability of cutaneous perforators, and both their number and calibre.[1,2] Pertinently, it has been described that in a significant minority of cases (up to 5%) clinicians have encountered an unexpected absence of suitable cutaneous perforators intraoperatively.[3,4]

Current practice in the UK commonly involves the preoperative mapping of cutaneous perforators by the surgeon at the bedside using a hand-held Doppler device, which is both readily available and economical. It is widely acknowledged, however, that such hand-held acoustic Doppler devices do not reliably identify small perforators, and there is a relatively high discordance rate with intraoperative findings.[5] Other imaging modalities are available to assist the reconstructive surgeon including computed tomography (CT), magnetic resonance imaging (MRI) angiography, and thermal imaging, as well as colour-flow Doppler ultrasound (CFDU).

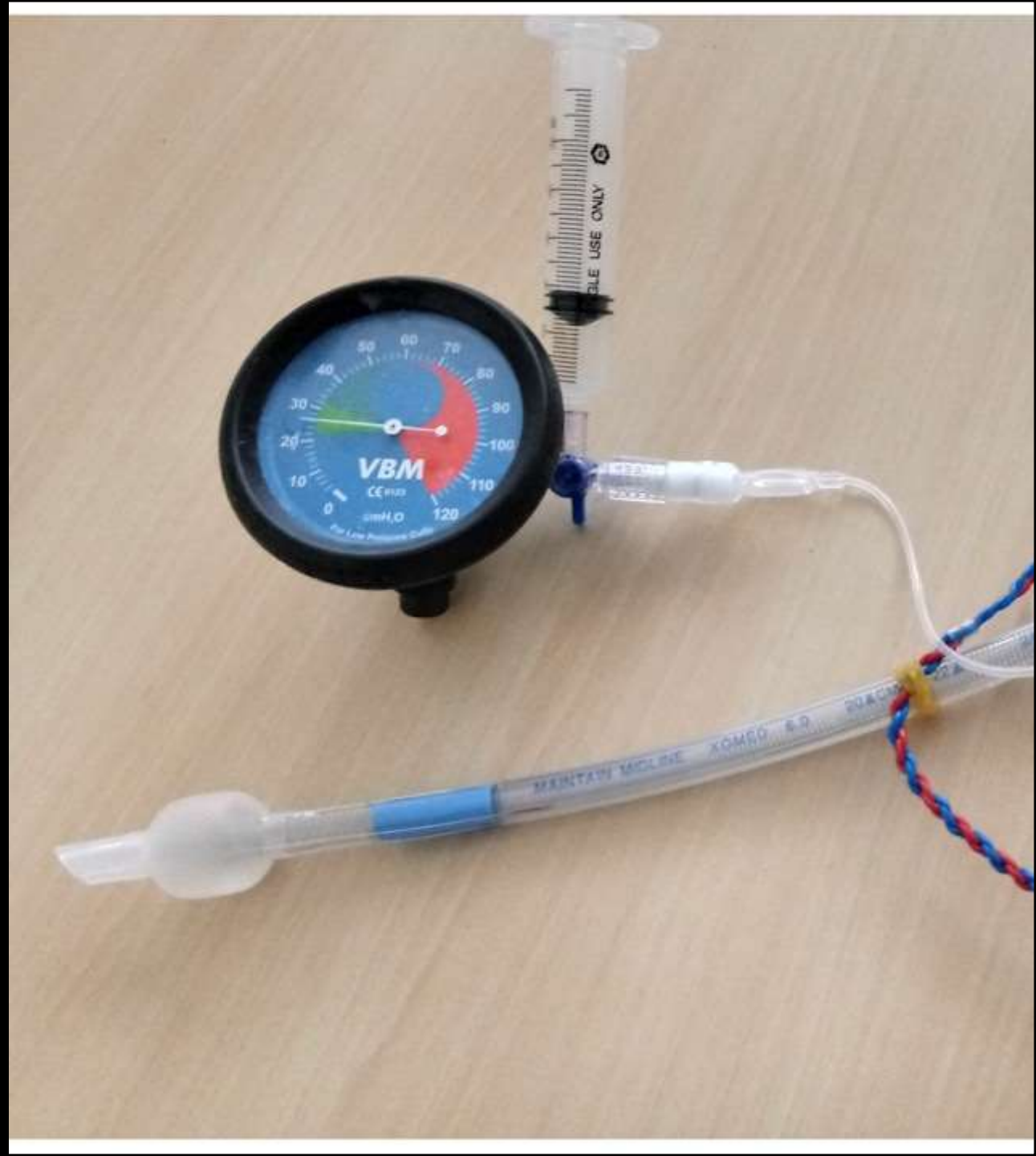
Published studies have demonstrated that the reliability of CFDU to evaluate the anatomy of the perforator vessels is equivalent to that of conventional angiography, with the additional advantages that it is non-invasive, quick, and accessible.[6,7]

We have been utilising CFDU in real time during the course of head and neck reconstructive surgery at our institution, and wish to highlight its utility as an adjunct in the planning of perforator flaps. In our unit the imaging is performed by our head and neck anaesthetic team, but it could equally be undertaken by other sonographers with requisite training.

Discussion

* Corresponding author at: Department of Maxillofacial / Head & Neck

Neuromuscular monitoring



Thyroid Cancer

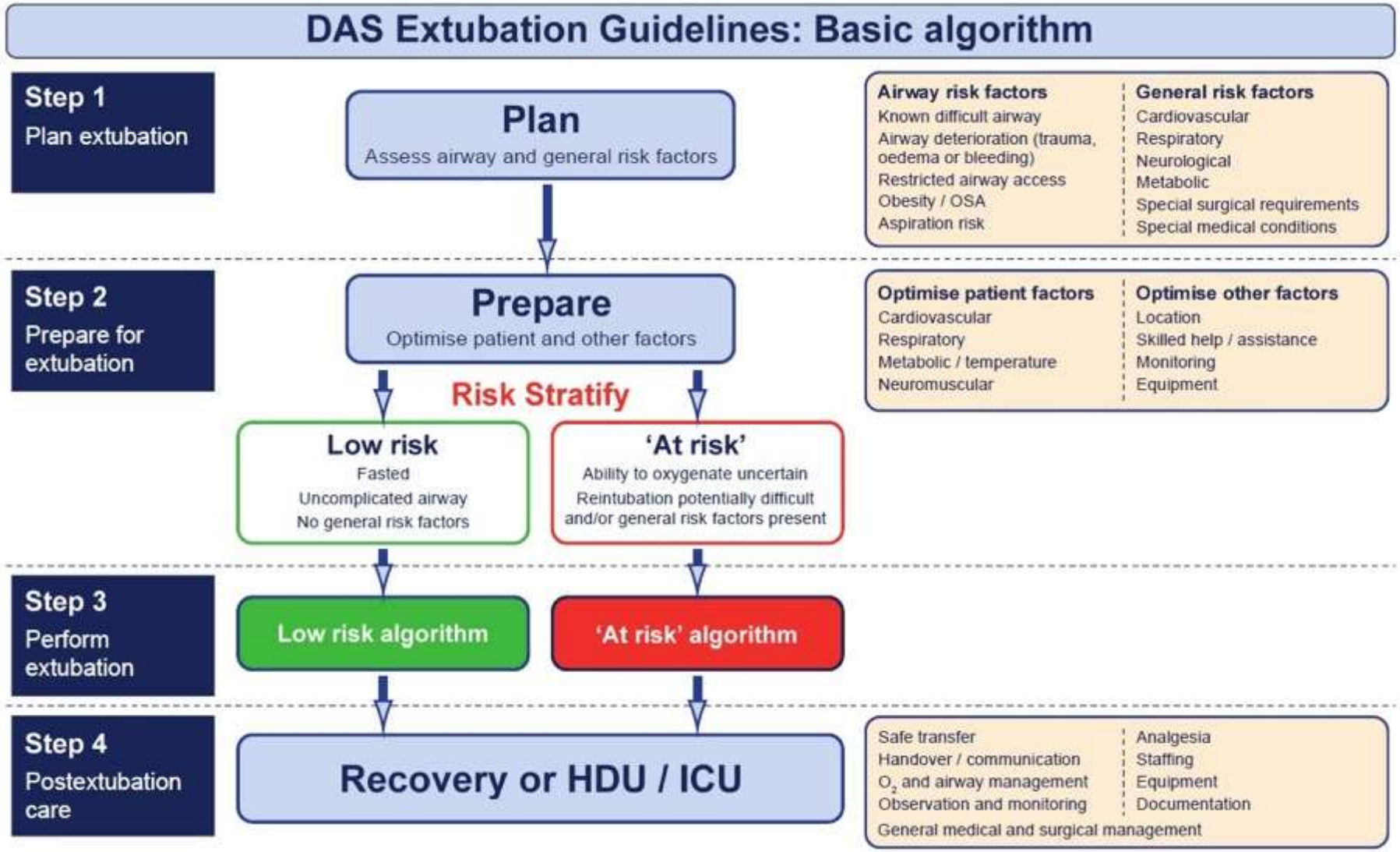
- Thyroid function
  - Medical optimization
- Difficult airway
  - Difficult plan D
- Retrosternal Goitre
  - Rigid bronchoscopy
  - Jet ventilation
- Cardiothoracics may be required

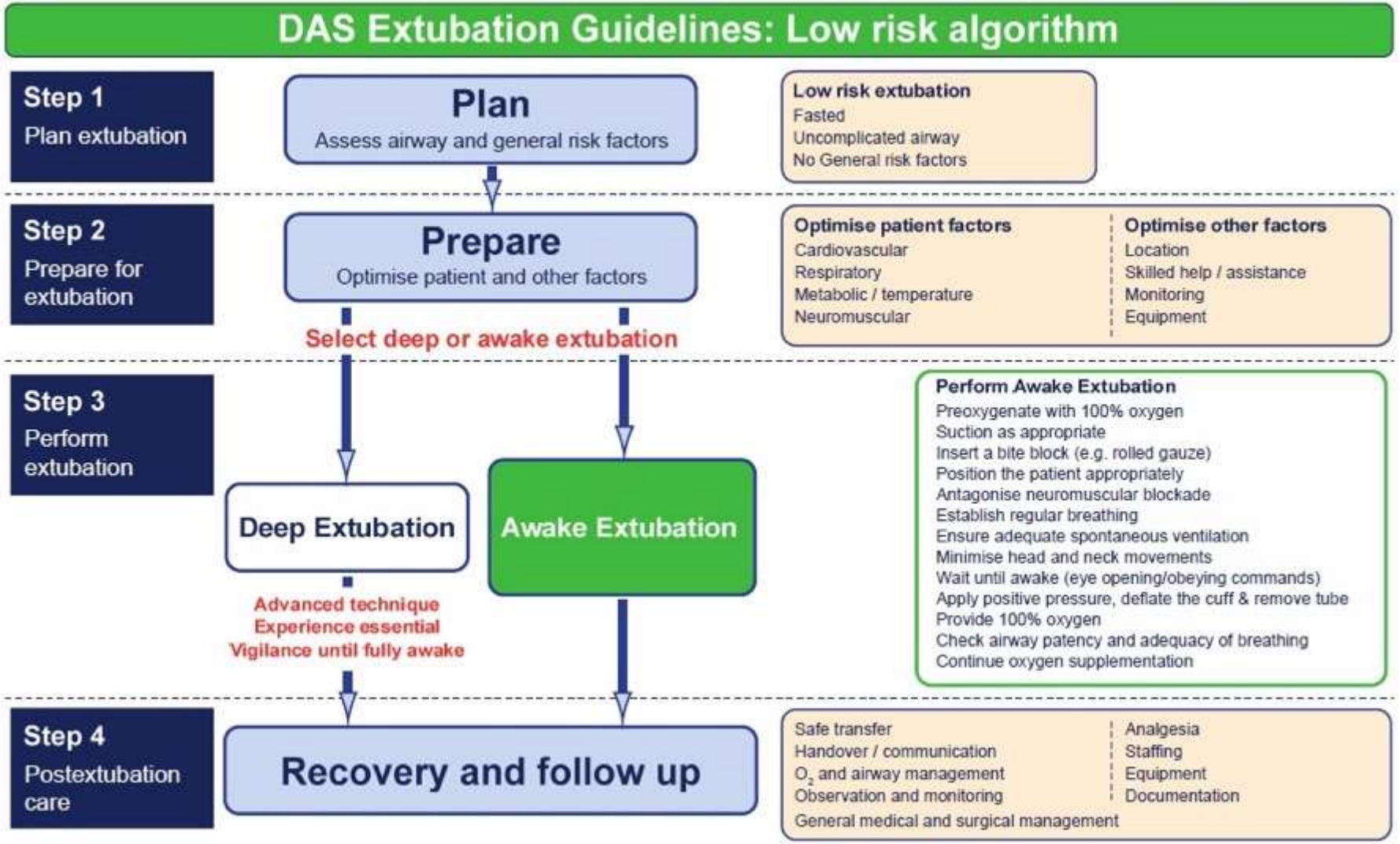
Panendoscopy

CHALLENGING

DEEPLY STIMULATING

SHORT LIVED


DAS Extubation Guidelines: Basic algorithm
Step 1
Plan extubation
Plan
Assess airway and general risk factors
Airway risk factors
Known difficult airway
Airway deterioration (trauma, oedema or bleeding)
Restricted airway access
Obesity / OSA
Aspiration risk
General risk factors
Cardiovascular
Respiratory
Neurological
Metabolic
Special surgical requirements
Special medical conditions
Step 2
Prepare for extubation
Prepare
Optimise patient and other factors
Optimise patient factors
Cardiovascular
Respiratory
Metabolic / temperature
Neuromuscular
Optimise other factors
Location
Skilled help / assistance
Monitoring
Equipment
Risk Stratify
Low risk
Fasted
Uncomplicated airway
No general risk factors
'At risk'
Ability to oxygenate uncertain
Reintubation potentially difficult and/or general risk factors present
Step 3
Perform extubation
Low risk algorithm
'At risk' algorithm
Step 4
Postextubation care
Recovery or HDU / ICU
Safe transfer
Handover / communication
O_2 and airway management
Observation and monitoring
Analgesia
Staffing
Equipment
Documentation
General medical and surgical management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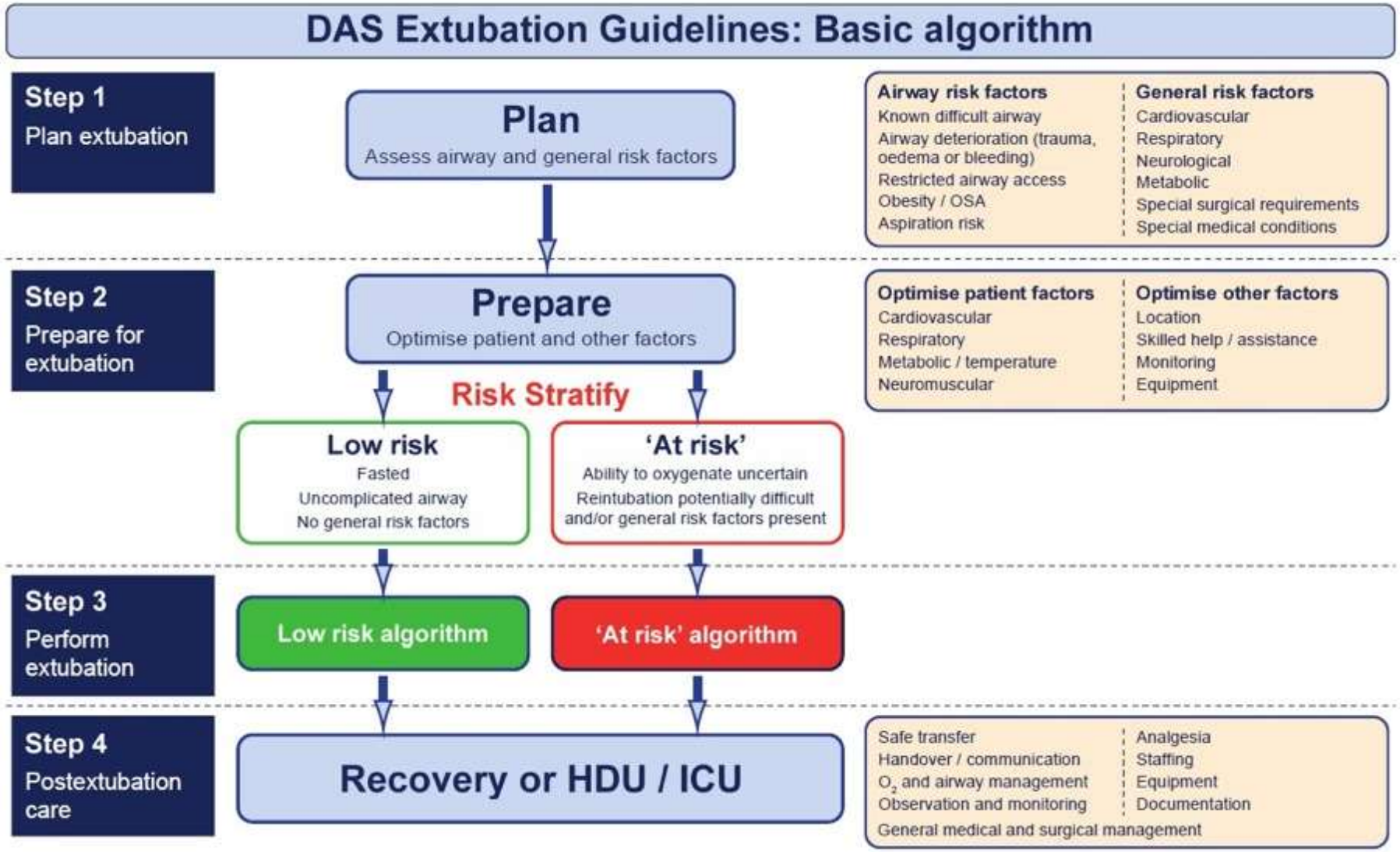
Optimise patient factors
Cardiovascular
Respiratory
Metabolic / temperature
Neuromuscular
Optimise other factors
Location
Skilled help / assistance
Monitoring
Equipment
Select deep or awake extubation
Step 3
Perform extubation
Deep Extubation
Awake Extubation
Advanced technique
Experience essential
Vigilance until fully awake
Perform Awake Extubation
Preoxygenate with 100% oxygen
Suction as appropriate
Insert a bite block (e.g. rolled gauze)
Position the patient appropriately
Antagonise neuromuscular blockade
Establish regular breathing
Ensure adequate spontaneous ventilation
Minimise head and neck movements
Wait until awake (eye opening/obeying commands)
Apply positive pressure, deflate the cuff & remove tube
Provide 100% oxygen
Check airway patency and adequacy of breathing
Continue oxygen supplementation
Step 4
Postextubation care
Recovery and follow up
Safe transfer
Handover / communication
O2 and airway management
Observation and monitoring
Analgesia
Staffing
Equipment
Documentation
General medical and surgical management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General risk factors
Cardiovascular
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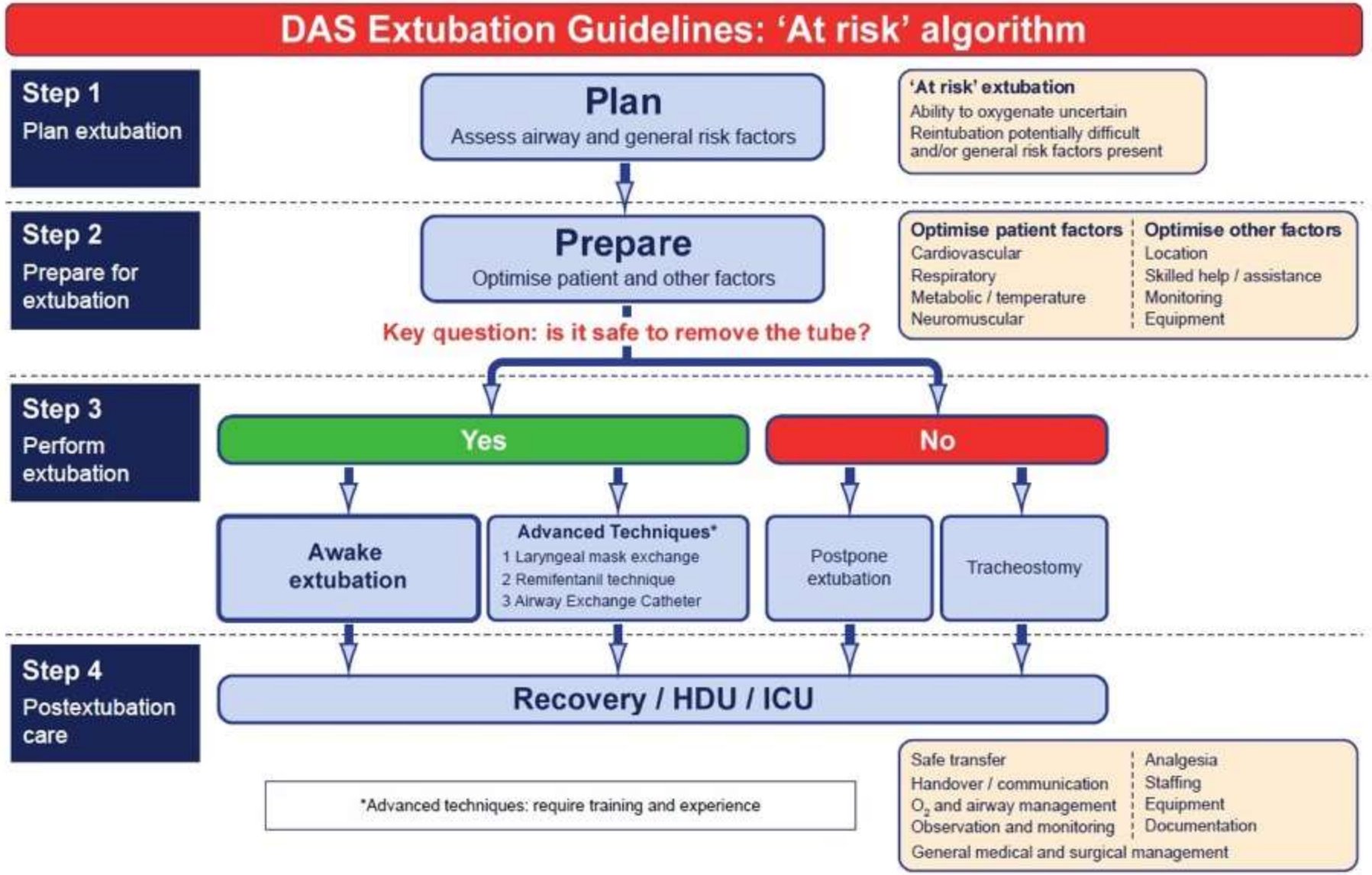
Neurological
Metabolic
Special surgical requirements
Special medical conditions
Step 2
Prepare for extubation
Prepare
Optimise patient and other factors
Optimise patient factors
Cardiovascular
Respiratory
Metabolic / temperature
Neuromuscular
Optimise other factors
Location
Skilled help / assistance
Monitoring
Equipment
Risk Stratify
Low risk
Fasted
Uncomplicated airway
No general risk factors
'At risk'
Ability to oxygenate uncertain
Reintubation potentially difficult and/or general risk factors present
Step 3
Perform extubation
Low risk algorithm
'At risk' algorithm
Step 4
Postextubation care
Recovery or HDU / ICU
Safe transfer
Handover / communication
O_2 and airway management
Observation and monitoring
Analgesia
Staffing
Equipment
Documentation
General medical and surgical management


DAS Extubation Guidelines: 'At risk' algorithm
Step 1
Plan extubation
Plan
Assess airway and general risk factors
'At risk' extubation
Ability to oxygenate uncertain
Reintubation potentially difficult
and/or general risk factors present
Step 2
Prepare for extubation
Prepare
Optimise patient and other factors
Optimise patient factors
Cardiovascular
Respiratory
Metabolic / temperature
Neuromuscular
Optimise other factors
Location
Skilled help / assistance
Monitoring
Equipment
Key question: is it safe to remove the tube?
Step 3
Perform extubation
Yes
No
Awake extubation
Advanced Techniques*
1 Laryngeal mask exchange
2 Remifentanil technique
3 Airway Exchange Catheter
Postpone extubation
Tracheostomy
Step 4
Postextubation care
Recovery / HDU / ICU
Safe transfer
Handover / communication
O_2 and airway management
Observation and monitoring
Analgesia
Staffing
Equipment
Documentation
General medical and surgical management
*Advanced techniques: require training and experience

- Long, hollow tracheal catheters.
- Most suitable sizes for extubation:
  - 83cm 11-14 FG
  - ID: 2.3-3.0 mm
  - ED: 3.7-4.7 mm
- Insufflation via jet ventilation of O2 is a last resort due to possible barotrauma.
- Prospective study of 354 patients over 9 years confirmed safety and successful re-intubation.
- Observation of larynx directly or via video laryngoscopy increases reintubation success.

- Decide depth of AEC. The distal tip should lie above the carina. No more than 25cm in an adult.
- When ready for extubation, insert lubricated AEC.
- Laryngoscopy and suction under direct vision.
- Remove ET tube over AEC.
- Secure AEC to cheek or forehead.
- Confirm leak around AEC with circuit.
- Clearly label AEC to prevent confusion with NG.
- Nurse patient in HDU/ICU.
- Supplemental O_2 via face mask/nasal cannula.
- NBM till AEC removed.
- Record AEC depth in patient notes.
- If coughing, check tip above carina and inject lidocaine down AEC.
- Remove AEC when airway no longer at risk (tolerated up to 72 hours).

Extubation

- Systematic approach
- Make it part of your strategy, plan early
- Remifentanil
- Difficult airway always a risk
- Backup: Airway Exchange Catheter

Post-operative Care

- Expect moderate pain
- New tracheostomy: humidified O_2 & Lidocaine
- Oral intake
- Regular anti-emetics
- Liberal fluid regime
- IV steroids for 48-72 hrs

Post-operative care of the free flap

- Normotension
- Normothermia
- Adequate filling
- Regular monitoring of flap
- Haematocrit – aim 30-35%
- Thromboprophylaxis

Emergency Airway Rescue

Head elevation

Nebulised epinephrine

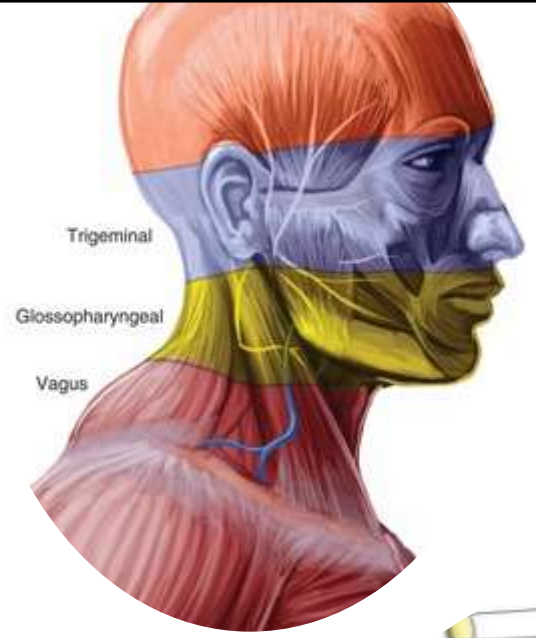
HFNO

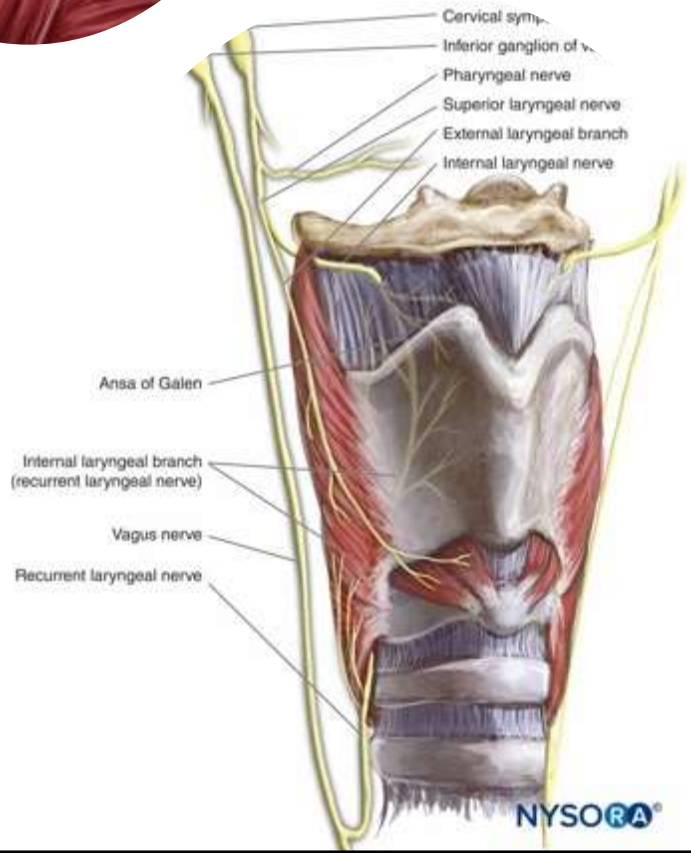
Flexible naso-endoscopy to inform ease of AFOI (time allowing)

Displaced new tracheostomy as per national tracheostomy guidelines

Nerve Blocks for ATI

https://www.nysora.com/techniques/head-and-neck-blocks/airway/regional-topical-anesthesia-awake-endotracheal-intubation/





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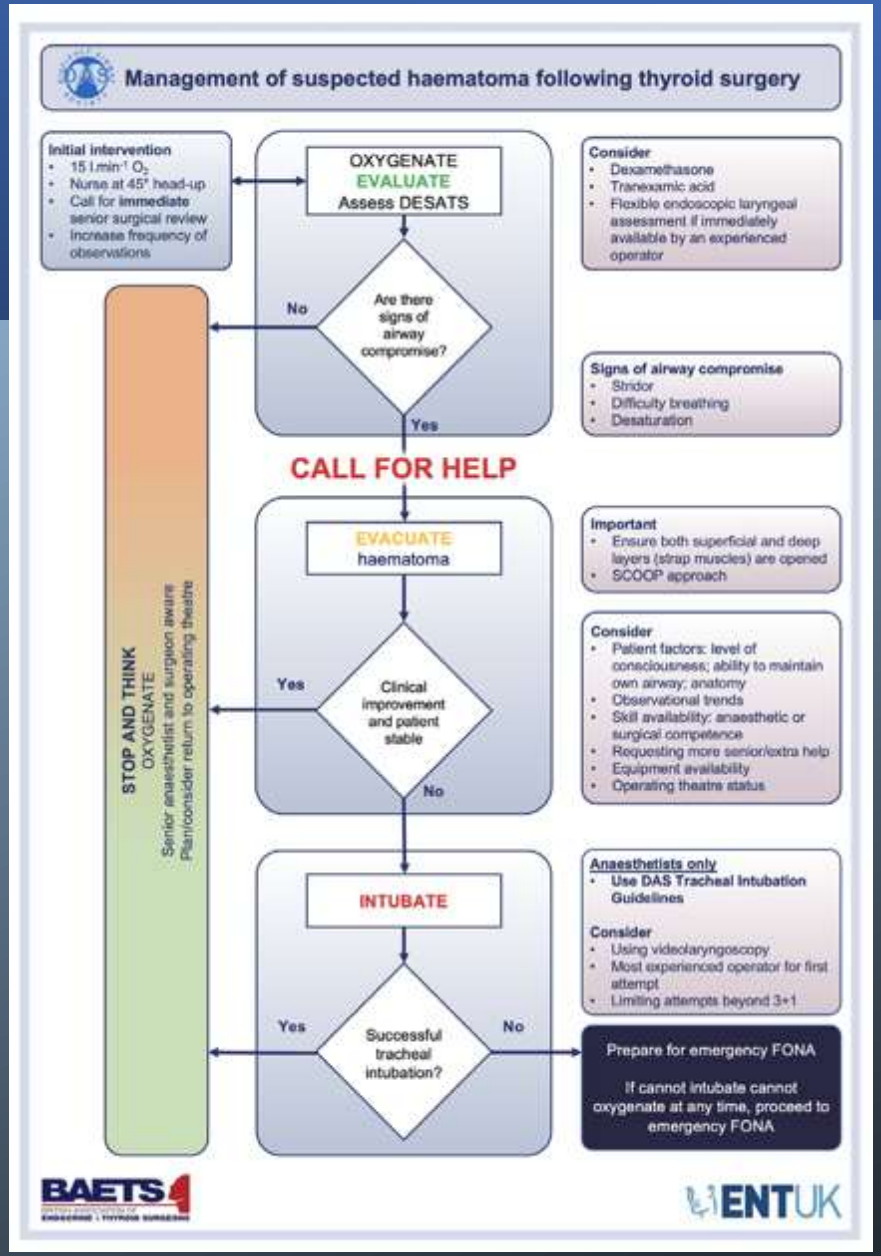
Guidelines

Management of haematoma after thyroid surgery: systematic review and multidisciplinary consensus guidelines from the Difficult Airway Society, the British Association of Endocrine and Thyroid Surgeons and the British Association of Otorhinolaryngology, Head and Neck Surgery

H. A. Iliff,[1,2] K. El-Boghdadly,[3,4] I. Ahmad,[3,4] J. Davis,[5] A. Harris,[6] S. Khan,[7] V. Lan-Pak-Kee,[8] J. O'Connor,[9] L. Powell,[1,2] G. Rees[10] and T. S. Tatla[11]


Management of suspected haematoma following thyroid surgery
Initial intervention
• 15 l.min-1 O2
• Nurse at 45° head-up
• Call for immediate senior surgical review
• Increase frequency of observations
OXYGENATE
EVALUATE
Assess DESATS
Are there signs of airway compromise?
No
Yes
Consider
• Dexamethasone
• Tranexamic acid
• Flexible endoscopic laryngeal assessment if immediately available by an experienced operator
Signs of airway compromise
• Stridor
• Difficulty breathing
• Desaturation
CALL FOR HELP
EVACUATE
haematoma
Important
• Ensure both superficial and deep layers (strap muscles) are opened
• SCOOP approach
Clinical improvement and patient stable
Yes
No
Consider
• Patient factors: level of consciousness; ability to maintain own airway; anatomy
• Observational trends
• Skill availability: anaesthetic or surgical competence
• Requesting more senior/extra help
• Equipment availability
• Operating theatre status
STOP AND THINK
OXYGENATE
Senior anaesthetist and surgeon aware
Plan/consider return to operating theatre
INTUBATE
Anaesthetists only
• Use DAS Tracheal Intubation Guidelines
Consider
• Using videolaryngoscopy
• Most experienced operator for first attempt
• Limiting attempts beyond 3+1
Successful tracheal intubation?
Yes
No
Prepare for emergency FONA
If cannot intubate cannot oxygenate at any time, proceed to emergency FONA
BAETS
ENTUK

Management of acute haematoma following thyroid surgery: EVACUATE

*Signs of airway compromise:
Stridor; difficulty breathing; desaturation

WRITE CONTACT NUMBERS HERE

S SKIN EXPOSURE

C CUT SUTURES

O OPEN SKIN

O OPEN MUSCLES

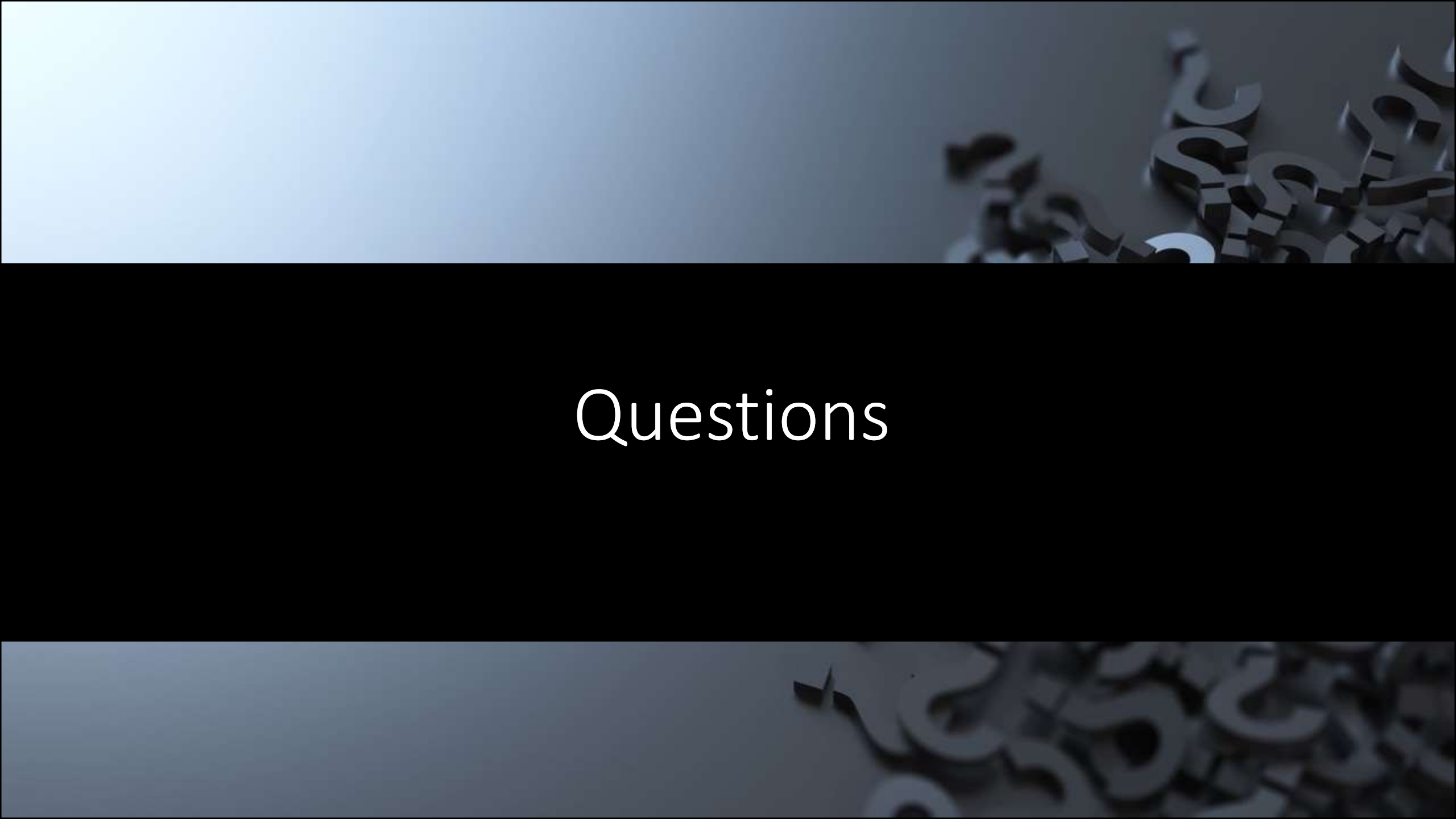
P PACK WOUND

BAETS

ENTUK

AIRWAY TOPICS

- Difficult Airway Society Guidelines inc Awake Tracheal Intubation (ATI)
- Assessment of the airway:
  - Scoring systems
  - Interpretation of radiology and flow volume loops
- Laser and the airway
- One-lung ventilation
- Jet Ventilation (Twinstream ventilator)
- Principles underlying the use of Heliox


Questions