

Risky Extubation

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8th Dubai Anaesthesia
Conference & Exhibition



Risky Extubation

Declaration

COOKMEDICAL

Risky Extubation

Extubation plan – DAS guideline



Anaesthesia

Journal of the Association of Anaesthetists of
Great Britain and Ireland

Guidelines

Difficult Airway Society Guidelines for the management of tracheal extubation



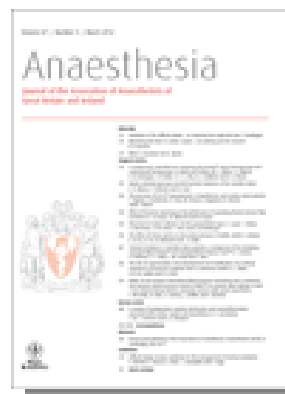
Membership of the Difficult Airway Society
Extubation Guidelines Group: M. Popat
(Chairman)¹, V. Mitchell², R. Dravid³, A.
Patel⁴, C. Swampillai⁵, A. Higgs⁶

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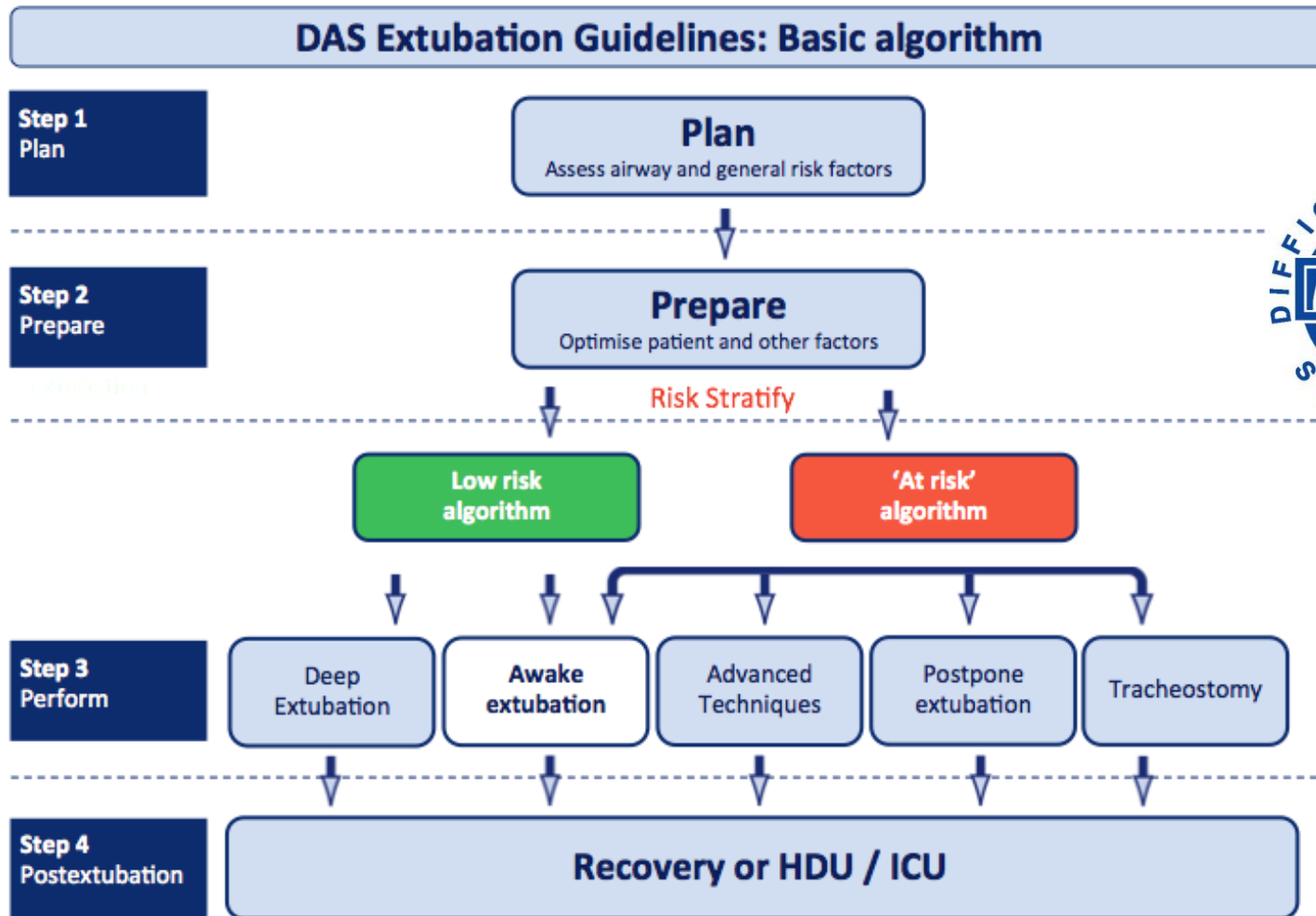
Issue



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Risky Extubation



Risky Extubation

'At Risk' algorithm

'At risk'

Ability to oxygenate uncertain
Reintubation may be difficult
+/- general risk factors present

Examples:

- Unstable patient
- Access not guaranteed (e.g. halo, wires)
- Airway distorted (surgery, blood, fluid)
- Difficulty at intubation
- Obese, OSA



Decide: is it safe to remove the tube?

Yes

No

Awake
Extubation

Advanced
Techniques*

Postpone
Extubation

Tracheostomy

Risky Extubation

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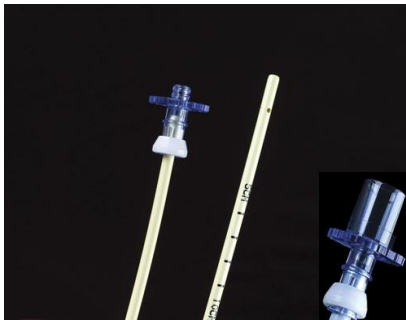
1. LMA Exchange
2. Awake + remifentanyl technique
3. Airway exchange catheter



Risky Extubation

Airway Exchange Catheters

11 CAEC post maxillo-facial surgery



Used as intubation stylets

Risky Extubation

Airway Exchange Catheters

RELATIVELY SIMPLE, BUT REQUIRE ATTENTION TO DETAIL

F'scope through ETT - tip mid-trachea: facial landmark

Insert AEC through ETT to same depth, just inside ETT

Never advance AECs against resistance

Remove ETT over AEC, maintaining AEC's tracheal position

Position AEC at correct depth & secure it (circumferential tape)

Check ETCO₂ & check leak around AEC

Label AEC – do not confuse with nasogastric tube – NPO

Observe closely in PACU or HDU

Annotate correct depth on the chart & CXR

Remove when re-intubation unlikely (2...8 hours...3/7)



Risky Extubation

AECs EVIDENCE – Mort et al

9 year prospective practice analysis; 354 pts extubated over AEC

72% = known DI; 28% suspected DI

87 reintubated: **51** re-intubated whilst AEC in situ

36 re-intubated after AEC electively removed

11 & 14 COOK AEC (> 90% well tolerated)

Overall success rate = 47/51 = **92%**

1st attempt = 41/47

2nd attempt = 5/47 need ↓ ETT

3rd attempt = 1/47

AEC migrated = 3/51

Failed AEC re-intubation = 1/51 : Fastrach™ LMA

Mort T. et al 2007

Risky Extubation

AECs EVIDENCE – Mort et al

Process re-intubation : 44/51 = bag/mask

7/51 = 3-6 L/min insufflation

none needed jet ventilation

27% local to airway or NIL

73% sedated (midaz / propofol / etomidate); NMB = 2

DL / jaw thrust / tongue retraction used

Risky Extubation

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Table 3. Complications of the Reintubation Procedure

	AEC present (n = 51)	AEC absent (n = 36)	P
First-pass success rate for reintubation	87%	14% (5)	<0.02
Hypoxemia during reintubation (SpO ₂ <90%)	8% ^b (4)	50% (18)	<0.01
Severe hypoxemia during reintubation (SpO ₂ <70%)	6% ^a (3)	19% (7)	0.05
Bradycardia (heart rate <40) with hypotension	4% (2)	14% (5)	<0.05
Multiple intubation attempts (≥3) including the placement of an accessory airway device	10% ^b (5)	77% (28)	<0.02
Esophageal intubation	0	18% (6)	
Rescue airway device/technique	6% ^a (3)	90% (32)	<0.01

^a Includes the AEC failures due to inability to pass ETT into trachea (1 case) and proximal migration of the AEC out of the trachea (3 cases).

Risky Extubation

AECs EVIDENCE - Mort et al

36 patients in 2nd group

DL > 3+ : 3

LMA / Fastrach: 20

Fibrescope: 6

Rigid fibrescope: 4

GEB: 3

Surgical airway: 4 (2 FM ventilation & 2 LMA ventilation)

‘Mort has confirmed AECs are safe & effective’


P Biro. Anesth Anal. 2007

Risky Extubation



Airway Exchange Catheters: Simple Concept, Potentially Great Danger

Benumof, Jonathan L.



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September 16, 2010

Mr. Stanley Mandarich
 Executive Director
 Canadian Anesthesiologists' Society
 1 Eglinton Avenue East
 Suite 208
 Toronto, ON
 M4P 3A1

Canadian Journal of Anesthesia / Journal canadien d'anesthésie
 June 2011, Volume 58, Issue 6, pp 560-568

Brief review: Supplementing oxygen through an airway exchange catheter: efficacy, complications, and recommendations

Laura V. Duggan MD, J. Adam Law MD, Michael F. Murphy MD

Dear Mr. Mandarich:

Re: Airway Exchange Catheters (AEC)/Endotracheal Ventilation Catheter (ETVC)

The Office of the Chief Coroner of Ontario investigated the death of a healthy 22-year old male following surgery for a dentofacial deformity. He was a low anaesthetic risk (ASA Classification I) and underwent uneventful surgery and anaesthesia. Intermaxillary fixation was applied using elastic traction, and a nasogastric tube was inserted at the end of the procedure. He was awake and responding appropriately in the operating room. An Airway Exchange Catheter (AEC) was inserted through the endotracheal tube prior to the endotracheal tube being removed. He was stable, awake and breathing spontaneously prior to moving from the Operating Room. He was transferred to the Post Anaesthetic Care Unit (PACU) with the AEC attached to an oxygen tank. He arrived in the PACU and the AEC was attached to oxygen at a flow rate of 5 litres/min. Within 3



Risky Extubation

Oxygenation through AECs



Risky Extubation

AECs: Planned ICU Extubation

37 year old ♀

Dental abscess

Trismus: 1cm

Awake FO Intubation

#6.0mm ETT

@1/7

Alfentanil 1mg/hr



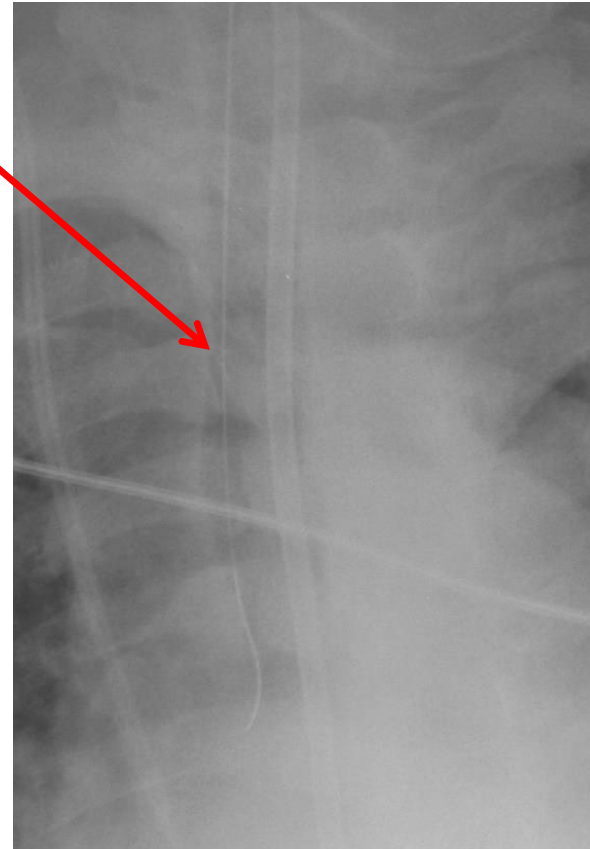
Risky Extubation

AECs: Planned ICU Extubation



Risky Extubation

Extubation wires



Risky Extubation

AECs: If patient deteriorates

- If medical - Treat the cause
- If airway - Sit-up
 - 100% O₂: face mask +/- AEC (depth & leak)
 - Epinephrine nebs
 - (?Heliox – easier said than done!)
 - CPAP / NIV
 - Summon help - ? surgeon
 - Check equipment
 - ? in theatre, consider transfer : judgement
 - ETCO₂ & check depth

Risky Extubation

AECs: If patient deteriorates

Railroading the ETT

- If ETT size: smallest possible
- Flexible ETT
- +/- Sedation
- Position sitting up
- Full inspiration +/- protrude tongue
- Gentle direct laryngoscopy to displace tongue only
- 90° anti-clockwise rotation
- ? VL / FO to try ID site of hold-up
- 86% first time success rate (see above)

Risky Extubation

AECs: If patient deteriorates

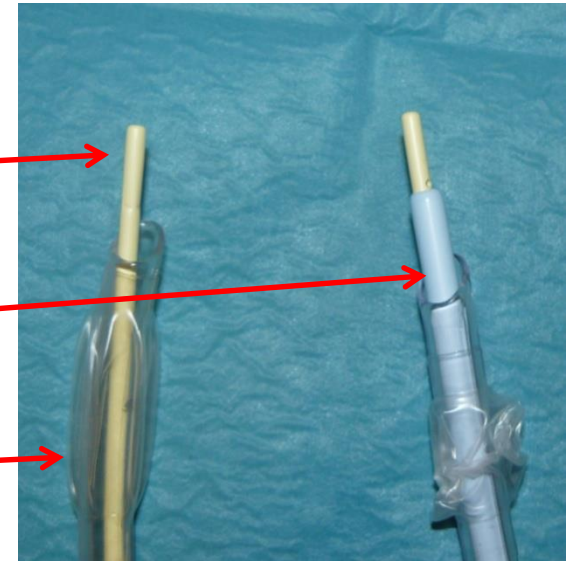
Railroading the ETT

- Any railroading procedure
- ‘**Mind the gap**’ between ETT & stylet

11 COOK AEC

Aintree Catheter

7.0mm ETT



Airway Exchange Catheters

Catheter Fr	Catheter Length /cm	Catheter ID / mm	ETT ID / mm
8	45	1.6	≥ 3
11	83	2.3	≥ 4
14	83	3.0	≥ 5
19	83	3.4	≥ 7

Risky Extubation

Step 3: Leave the ETT in situ



...for the medical SHO

Risky Extubation

Step 4: Post extubation care

Observations & warning signs – communication!

Early Red flags:

- Stridor
- Obstructed breathing

Swelling

Bleeding, haematoma

Agitation; 'I can't breath'

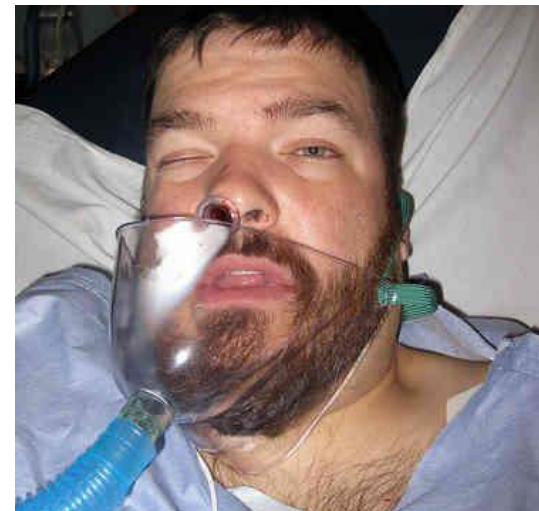
Change in voice

↓ cough, swallow, drool

Stridor

Lethargy, ↓LOC

Silent airway!



Risky Extubation

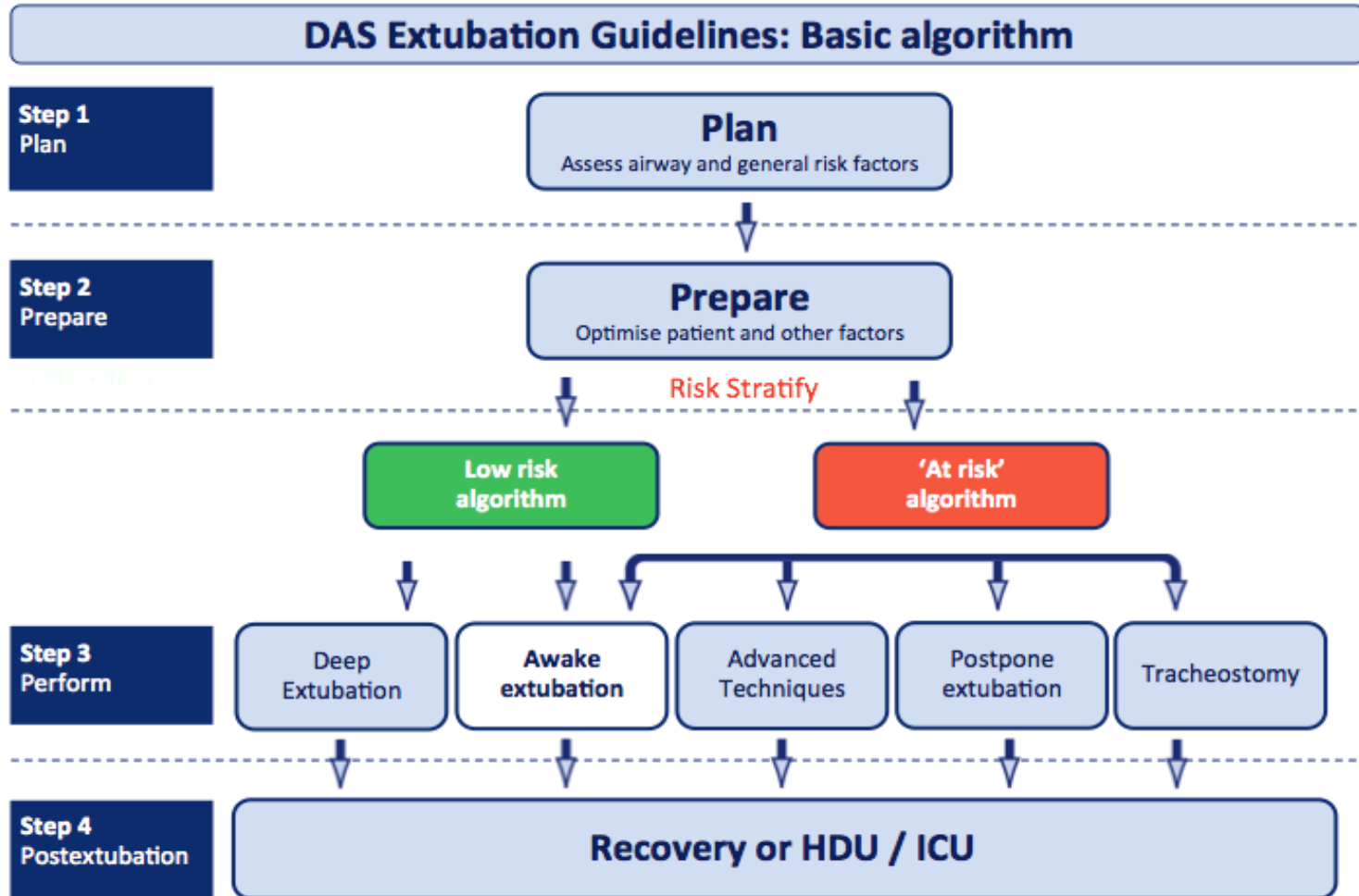
Late red flags

- If difficult intubation, be alert for Cx traumatic intubation:
- DI - pharyngeal / oesophageal; Routine - laryngeal

Mediastinitis

- Difficult to diagnose and deadly
- Have a high index of suspicion: ↑ sore throat, deep Cx pain, chest pain, fever, odynophagia, dysphagia
- Classic signs - crepitus, PTHx, Pneumomediastinum < 50%
- Sepsis after difficult airway Mx: consider **leak** or **deep infection**
- Low threshold CT

Risky Extubation



Risky Extubation

LMA Exchange

- Inappropriate if reintubation is difficult
- Inappropriate in un-fasted patients



Risky Extubation

Remifentanyl



Advanced Techniques*

1. Awake + remifentanyl technique
- 2. LMA Exchange**

Laryngeal Mask Exchange

Replacement of a tracheal tube with a LMA

Advanced technique

