Avoiding the 'risk rollercoaster' in airway management

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Outline

- Explore the factors that affect our perceptions of risk
- Discuss how these affect our decision-making, and why we might break ‘the rules’
- Show how it relates to airway management
- Describe ‘awake’ videolaryngoscopic intubation
- Offer an approach to airway problems

NAP4

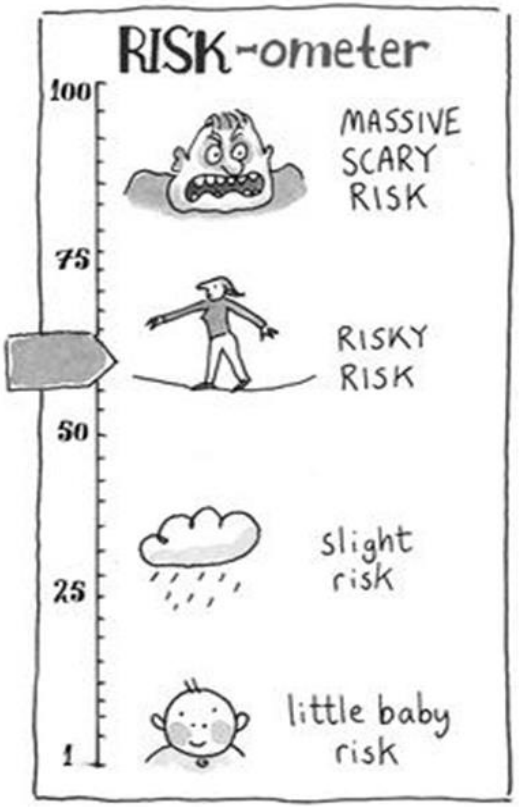
'A previously fit and well elderly woman required emergency incision and drainage of a buttock abscess. She had been starved for >24 h, was dehydrated and had signs of sepsis. An RSI was planned. Following a change of personnel, a standard intravenous induction with LMA insertion was performed. On transfer into theatre, the patient regurgitated and aspirated, dying later in Intensive Care. '

How do you take a decision?

- Objectively identify the full range of options, weighing each one carefully?
- Recognise a situation and draw on your experience to generate a course of action?
- Take a ‘gamble’ and await the outcome of your ‘bet’?
- Do what is least effort?

Factors affecting decision-making and risk

- Personality and attitude to risk
- Characteristics of risk itself
- Cognitive biases
- Social and cultural influences



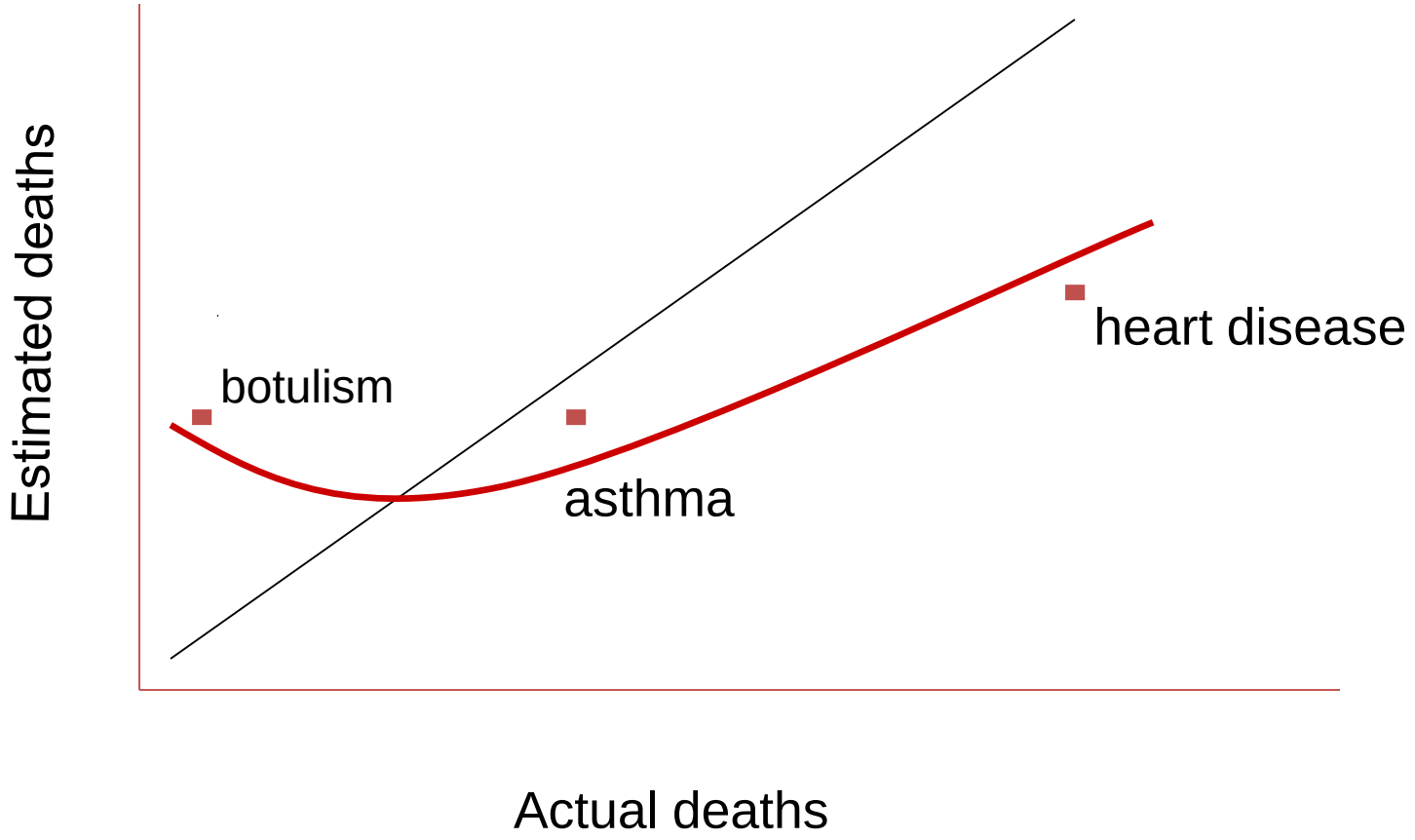
Risk perception: cognitive biases

- Miscalibration bias
- Availability bias
- Compression bias
- Representativeness bias

Stiegler MP et al *Br J Anaes* 2012; 108: 229-35

Availability bias

Compression bias



Representativeness bias

When things go ‘wrong’…

- *Mistakes* from not knowing
- *Mistakes* from forgetting
- *Slips* and *lapses* from distraction
- *Violations* (rule breaking)

Amalberti et al *Qual Saf Health Care* 2006; 15: i66-71

Why do people violate?

- They don’t believe in the rules
- They forget previous adverse consequences
- Flexibility is expected

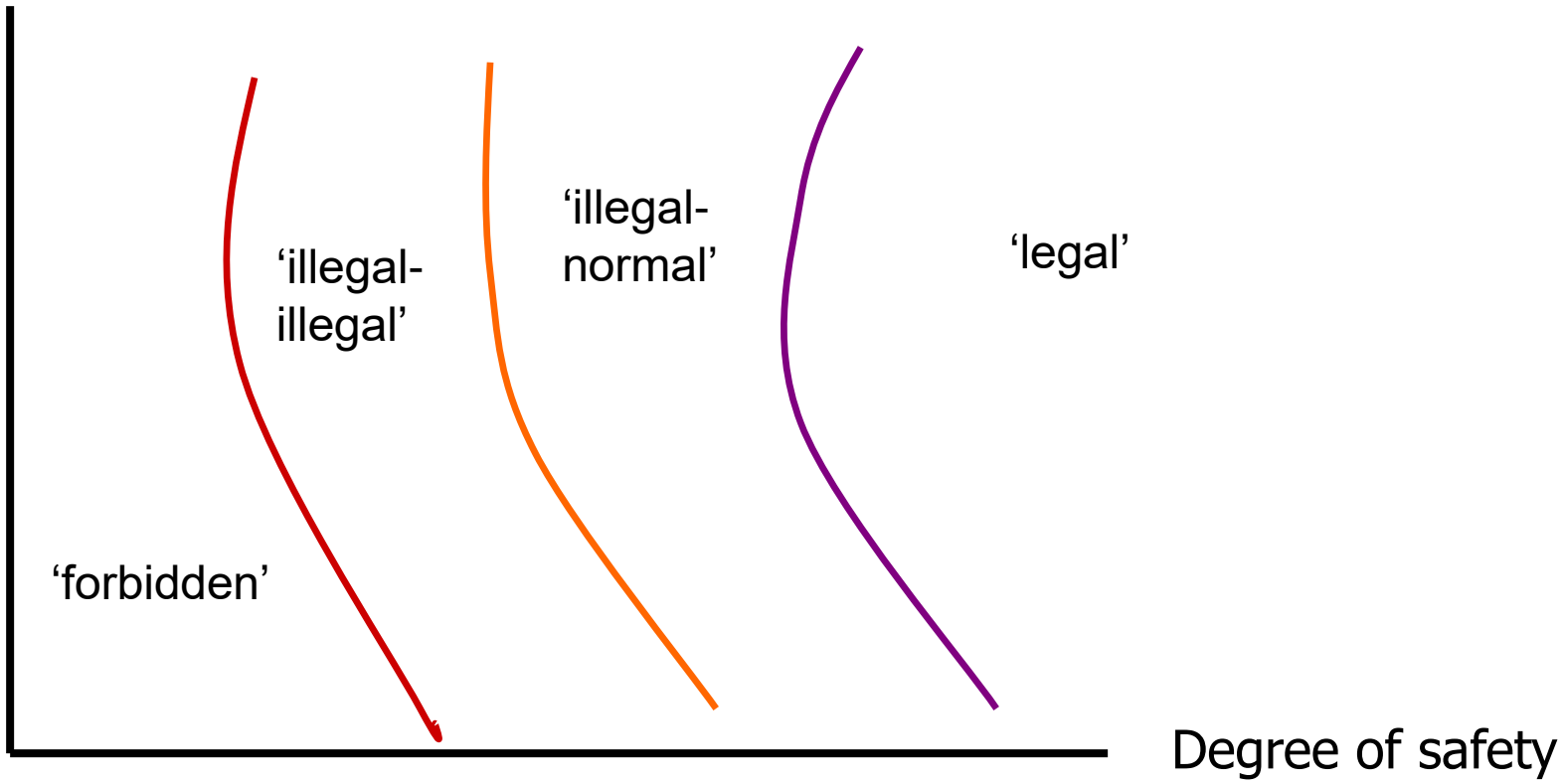
But it's not so simple……

Cook et al *Anaesthesia* 2011; 66:828-36

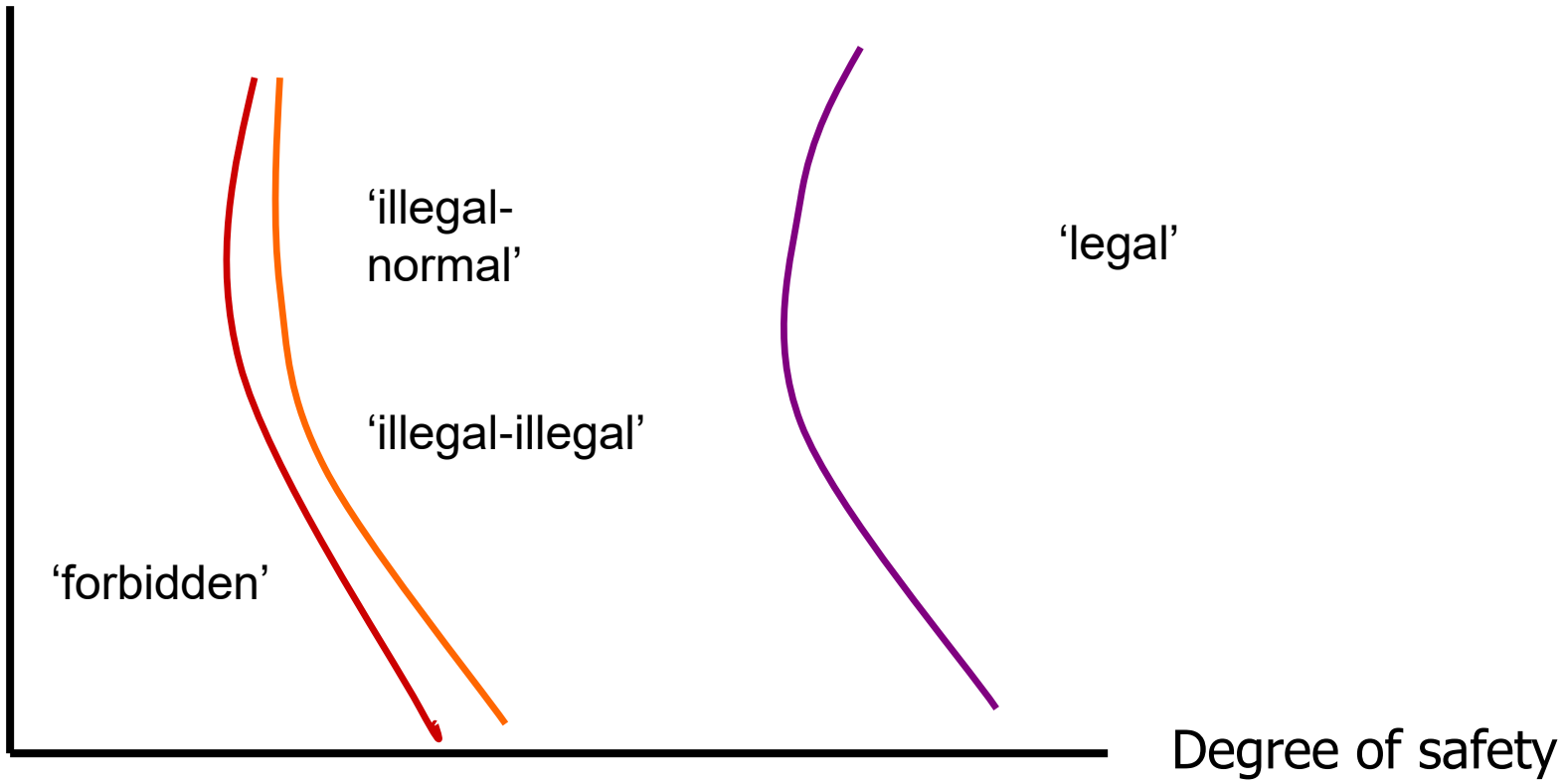
Why do people violate?

- They don’t believe in the rules
- They forget previous adverse consequences
- Flexibility is expected
- ‘Risky’ behaviours are ‘rewarded’
- Systems ‘migrate’

‘Safety spaces’



‘Safety spaces’



Human factors in NAP4

- Casual attitude to risk/overconfidence
- Inadequate checking procedures
- Attempts to use unfamiliar equipment in an emergency situation
- Fixation errors (failure to move to another solution)
- Peer tolerance of poor standards
- Organisational and professional cultures which induce or tolerate unsafe practices

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Further evaluation…

- Human Factors Interview Tool piloted in telephone interviews with 12 NAP4 reporting anaesthetists.
- Self-reported cognitive failures included not anticipating airway difficulties (e.g. regurgitation). Also decisions discussed (e.g. using LMA rather than ETT) which might in hindsight have been wrong.
- Average of 4.5 [1-10] human factors per case: situation awareness, job and person factors.

Flin et al *Anaesthesia* 2013; 68: 817-25

Risk recalibration after self-analysis

'……..it just makes you go back to being a little more cautious. I think that….however much you read in journals, a lot of how we practice in anaesthesia is based on an oscillating cycle of experience and anecdote. I think you continuously slightly compromise things and then you get a bit of a 'pull yourself back' because something has been a bit bad……..'

Avoiding the 'risk rollercoaster'……

- Being aware of one's own attitudes to risk and risk-taking and how this affects judgement
- Understanding why people 'break the rules'
- Sharing of problems and incidents helps 'recalibrate' our perceptions
- Creating and maintaining the right group milieu can help promote safety

Mercer et al *BJA Education* 2016; 16: 191-7

Risk and consent

- Airway risks are hard to quantify
- ‘Difficult’ airways are difficult in different ways: no single solution is possible
- ‘Awake’ techniques are an alternative BUT
- They change the focus of information, explanation and consent

Videolaryngoscopy

- ‘Failed intubations significantly fewer when used in patients with an anticipated difficult airway’

  Lewis SR et al *Cochrane Database of Systematic Reviews* 2016, Issue 11

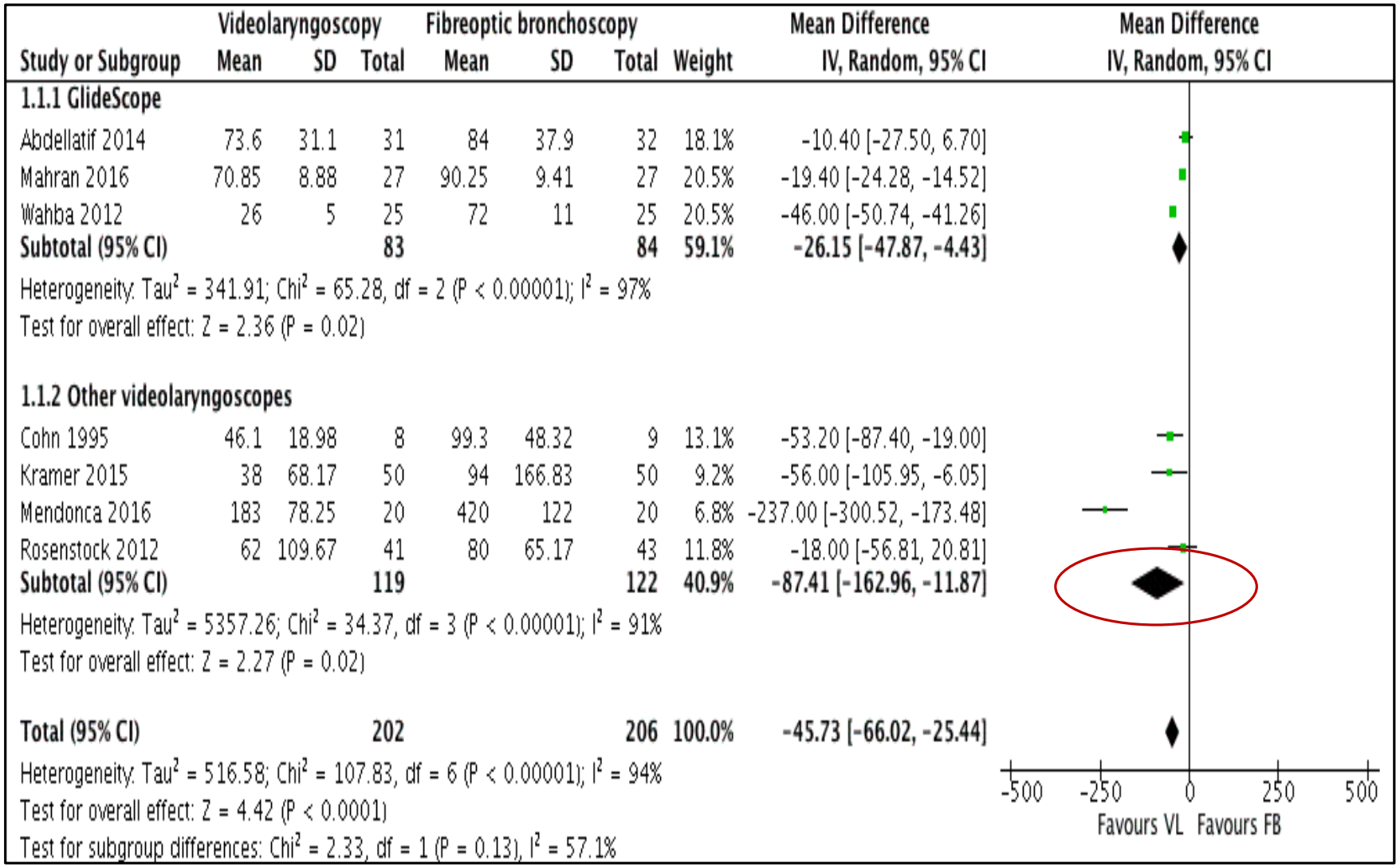
- ‘….if difficult laryngoscopy is predicted then videolaryngoscopy should be considered from the outset’

  Difficult Airway Society *Guidelines for the management of tracheal intubation in critically ill adults* 2018

‘Awake’ intubation

- Systematic review of awake fibreoptic and awake videolaryngoscopic intubation
- 8 RCTs, 429 patients
- Sedated with remifentanil
- Lidocaine by nebuliser, transtracheal injection, ‘spray as you go’, O_2 driven through cannula

Alhomary M et al Anaesthesia 2018; 73: 1151-61


Videolaryngoscopy
Fibreoptic bronchoscopy
Mean Difference
Mean Difference
Study or Subgroup Mean SD Total Mean SD Total Weight IV, Random, 95% CI
IV, Random, 95% CI
1.1.1 GlideScope
Abdellatif 2014 73.6 31.1 31 84 37.9 32 18.1% -10.40 [-27.50, 6.70]
Mahran 2016 70.85 8.88 27 90.25 9.41 27 20.5% -19.40 [-24.28, -14.52]
Wahba 2012 26 5 25 72 11 25 20.5% -46.00 [-50.74, -41.26]
Subtotal (95% CI) 83 84 59.1% -26.15 [-47.87, -4.43]
Heterogeneity: Tau² = 341.91; Chi² = 65.28, df = 2 (P < 0.00001); I² = 97%
Test for overall effect: Z = 2.36 (P = 0.02)
1.1.2 Other videolaryngoscopes
Cohn 1995 46.1 18.98 8 99.3 48.32 9 13.1% -53.20 [-87.40, -19.00]
Kramer 2015 38 68.17 50 94 166.83 50 9.2% -56.00 [-105.95, -6.05]
Mendonca 2016 183 78.25 20 420 122 20 6.8% -237.00 [-300.52, -173.48]
Rosenstock 2012 62 109.67 41 80 65.17 43 11.8% -18.00 [-56.81, 20.81]
Subtotal (95% CI) 119 122 40.9% -87.41 [-162.96, -11.87]
Heterogeneity: Tau² = 5357.26; Chi² = 34.37, df = 3 (P < 0.00001); I² = 91%
Test for overall effect: Z = 2.27 (P = 0.02)
Total (95% CI) 202 206 100.0% -45.73 [-66.02, -25.44]
Heterogeneity: Tau² = 516.58; Chi² = 107.83, df = 6 (P < 0.00001); I² = 94%
Test for overall effect: Z = 4.42 (P < 0.0001)
Test for subgroup differences: Chi² = 2.33, df = 1 (P = 0.13), I² = 57.1%
-500
-250
0
250
500
Favours VL
Favours FB

‘Awake’ videolaryngoscopy

Indications:

- Known or anticipated difficult airway
- Consider in obesity or obstructive sleep apnoea
- Known/suspected cervical cord trauma or unstable neck (eg severe rheumatiod arthritis) and risk of aspiration

Contraindications:

- Patient refusal/uncooperative patient
- Care with periglottic masses- risk of developing complete airway obstruction or laryngospasm

Wilson & Smith, *Royal College of Anaesthetists’ Bulletin*, Sept 2018

Technique

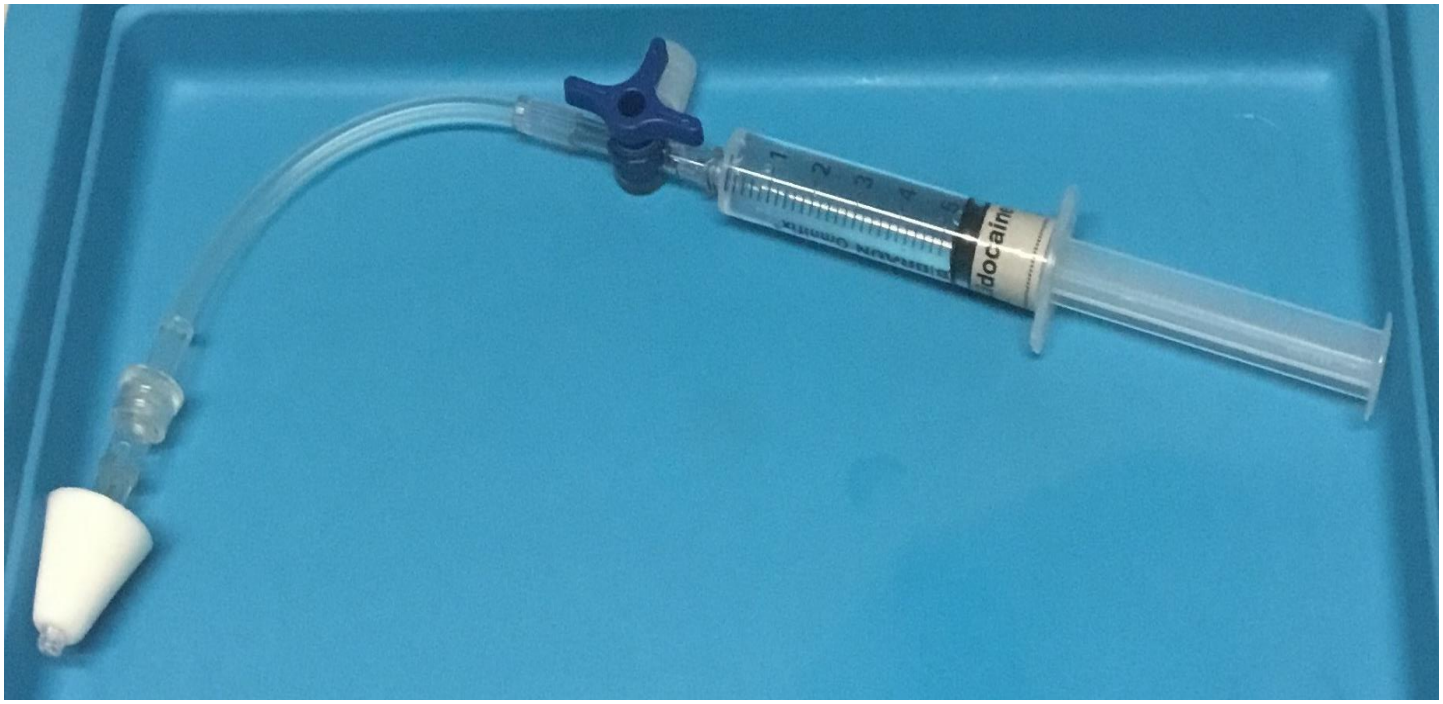
- Monitoring- Pulse oximetry/ECG/NIBP; capnography ready to attach
- Oxygen e.g. 4 L/min via nasal sponge/nasal ‘specs’
- Sedation: remifentanil by target-controlled infusion; typically 0.1 – 0.15 microg.kg-1.min-1 initially, increased as needed, whilst working on topical airway anaesthesia, to achieve a Ramsay sedation score of 2/3. Midazolam 1mg, or 20-30mg of propofol, can also be given for amnesia

Wilson & Smith, *Royal College of Anaesthetists’ Bulletin*, Sept 2018

- Lidocaine 10m/kg metered spray to tongue and oropharynx: 10-15 sprays initially. 4% lidocaine can be used if available. Ask patient to gargle with liquid, then spit out. Repeat.
- Insert Guedel airway to test adequacy of anaesthesia. If not, repeat spray and gargle once more
- Insert videolaryngoscope. If anaesthesia not adequate, repeat spray and gargle.
- Spray vocal cords under vision from ‘scope. Inject 5ml 2% lidocaine EITHER through a 10cm i.v. drip extension with mucosal atomisation device on end (MAD®) directed near larynx

Wilson & Smith, *Royal College of Anaesthetists’ Bulletin*, Sept 2018

Mucosal atomisation device (MAD)



- OR, via tracheal tube placed in oropharynx until tip visible near vocal cords, then 18Ch suction catheter with proximal end cut off, inserted to protrude through the end of tube near larynx (Luer lock syringe fits this gauge of catheter).
- If injections are timed to coincide with inspiration, lidocaine is drawn onto, and below, the cords.
- Test laryngeal anaesthesia with gentle application of Yankauer sucker. If not adequate, repeat lidocaine spray to cords.
- When adequate, advance tracheal tube through cords. Infraglottic anaesthesia is usually achieved by inhalation of lidocaine previously given higher in the airway.
- Confirm intratracheal placement with capnography and induce general anaesthesia.

Awake videolaryngoscopic intubation

- Pro: difficult mask ventilation, obesity, simple, ‘big screen’ useful, no ‘red out’, suction possible
- Con: limited mouth opening, patient experience, further loss of experience and confidence with fibreoptic technique
- Implications: should every anaesthetists be expert in all airway management options?

Welcome to ADAM version 3

The Aintree Difficult Airway Management Website

Logon to Adam

UserName:

Password:

Logon

Forgotten Password? Email my password

Apply to Register ? Register

The aim of the ADAM website is to:

Provide help for the management of anticipated difficult airways/ intubations

Customise the management plan to the individual patient's clinical problems

more details..

For registered professionals:

Anticipated difficult intubation planning

Anonymous airway managements archive

Incorporated literature updates for airway "scenarios"

New for version 3 of ADAM

For non-professionals:

Medical terms and how ADAM helps

Risks with “difficult airway/ intubation”

What if I need an operation?

Further Information for Non Professionals

Aintree six-step approach to difficult airway management

1. How much time do I have?
2. What access to the airway is available (nose, mouth, trachea)?
3. How compromised is the airway?
4. Which fascial spaces are involved?
5. Which management plan(s) best fits the circumstances?
6. Could I make the situation worse? If so, how?

Generic problems	Patient-specific problems
1. Check equipment/position patient Adverse patient position Inadequate nasal patency Illumination not satisfactory Monitor image not optimized Wrong size tube Wrong type of tube	
2. Prepare nares, oxygenate, start sedation Omit supplemental oxygen Increasing airway obstruction (LA effect) Apneoa (excess sedation) Respiratory depression (excess sedation)	
3. Mount tracheal tube on fibrescope Tube not loaded Tube loaded via Murphy's eye Tube/fibrescope interface not lubricated Omit anti-fog solution	
4. Negotiate fibrescope through the nose Fogging of lens Secretions obscure view Inadequate nasal patency Traumatic bleeding obscures view	Operator traumatizes nasal mucosa causing bleeding: coagulopathy

Avoiding the ‘risk rollercoaster’

- Ask for help
- Break down ‘risk’ into constituent hazards
- Plan for things going right and things going wrong (https://adam.liv.ac.uk)
- Go for it!


Thank you for your attention