

Use of Ambu AScope 3 Slim for difficult paediatric intubation - A manikin based study.

M. Sharma¹; T. Rajamanickam²; C. Mendonca³

¹University Hospitals Coventry & Warwickshire NHS Trust, m_ash76@yahoo.com; ²University Hospital of North Staffordshire NHS Trust, tamildoc@gmail.com; ³University Hospitals Coventry & Warwickshire NHS Trust, cyprianmendonca@hotmail.com

Background

Difficult airway in paediatrics may have a lower incidence compared to that in adults but systems must be in place to deal with this¹. According to the guidelines by Difficult Airway Society and Association of Paediatric Anaesthetists of United Kingdom the secondary intubation plan includes one attempt at fiberoptic intubation through a supraglottic airway (SAD) in an unanticipated difficult airway. Ambu® a Scope 3 slim is an acceptable alternative when a multiple-use fibre optic endoscope is unavailable². It is a flexible videoscope; having a maximum external diameter of 4.3mm and can be used to place an endotracheal tube with an internal diameter of 5mm or larger.

Objectives

We aimed to evaluate the use of Ambu® a Scope 3 slim for paediatric intubations through SAD in manikins and identify the time taken for successful intubation.

Material & Methods

Formal ethics committee approval was waived, as this was a manikin based study. All anaesthetists at University Hospitals Coventry & Warwickshire NHS Trust were invited to take part in the study. One of the investigators explained the technique of using Ambu® a Scope 3 slim to intubate the manikin followed by practical demonstration. The participants were requested to perform fiberoptic intubation of trachea through a size 2 LMA on a paediatric manikin. Intubation time was recorded using a stop watch from the point when the participant picked the fiberoptic bronchoscope in their hand until the tracheal tube placement was confirmed on the monitor. We also recorded the number of attempts required and ease of using the device on a scale of 0 to 10. (0 being very difficult and 10 being very easy to use the scope).

Results

In total 29 anaesthetists participated in the study. All the participants were successful in securing the airway using the Ambu aScope 3 Slim. Four out of the 29 (14%) participants required second attempt. The mean (SD) time taken was 37.74 (12.1) seconds for successful intubation. A mean (SD) score of 7.6 (2.5) was given by the participants for ease of use of the device.

Conclusion

Our study showed that 86% of the participants were successful at first attempt and success rate was 100% at second attempt. In general all appreciated the lightweight of the fiberoptic scope and the good quality views obtained. Ambu® aScope 3 slim can be used for paediatric intubation through SAD as an alternate multi-use paediatric flexible scope. As this is a manikin based study its use on paediatric patients should be further evaluated.

Acknowledgement

We thank Ambu A/S, Denmark for providing Ambu aScopes 3 slim for this study.

1. Dr. Ann Black, Dr. Tim Cook. Chapter 21, 4th National Audit Project of The Royal College of Anaesthetists and The Difficult Airway Society: March 2011; 180.
2. MTG14 Ambu aScope2 for use in unexpected difficult airways: NICE guidance.

Comparison of the performance of the Ambu AScope 3 versus a conventional bronchoscope in a simulated clinical scenario on the ICU requiring emergency airway management

E. Bellchambers¹; C. Williams²; S. Webster³

¹Cheltenham General Hospital, emma.bellchambers@nhs.net; ²Cheltenham General Hospital, christopherwilliams@doctors.org.uk; ³Cheltenham General Hospital, simon.webster2@glos.nhs.uk

Methods

22 ICU clinicians were provided with training in assembly and usage of a conventional bronchoscope and the Ambu aScope. This included gathering the equipment from the storage area. A simulated ICU clinical scenario was explained to the participants. Following this they were timed assembling and using both fibrescopes sequentially to visualise the carina of a manikin with an endotracheal tube in situ. Self reported confidence levels of the participants were obtained. We recorded any questions asked during the timed period and comments made on the equipment.

Results

Mean time for visualisation of the carina was 87.1 seconds (s) (range 53-122 s) using the Ambu aScope and 215.5 s (range 143-450 s) using the conventional bronchoscope. All participants took less time using the Ambu aScope than the conventional bronchoscope. Mean confidence levels were 9.1 with the Ambu aScope and 7.5 with the conventional bronchoscope. More questions were asked by participants when they were using the conventional bronchoscope. Comments relating to the Ambu aScope were all of a positive nature.

Discussion

Our study demonstrates significant superiority of the Ambu aScope compared to a conventional bronchoscope in terms of objective time-related performance in a simulated emergency airway scenario. In addition, subjective measures such as support required by the operator during use and confidence levels following training, showed that the Ambu aScope outperformed the conventional bronchoscope. The results of NAP 4¹ showed that 25% of airway related complications occur outside of the theatre environment, particularly in ICU and the ED. A lack of adequately trained staff and equipment was commonly seen on evaluation of reported events. Subsequent work has showed that only 63% of UK ICUs have a readily available fibroscope² despite the inclusion of fibrescopes in the DAS difficult airway guidelines³. Portable, easy to use and good quality airway equipment needs to be readily available in all clinical areas where airway interventions occur, and not just in the theatre environment. Our results demonstrate that the Ambu a-Scope fulfils at least the first two of these criteria. The results suggest that in an emergency scenario the Ambu aScope would be a far more useful piece of equipment than the conventional bronchoscope based on the time required for gathering and assembling. This must be regarded as a critical measure of performance when assessing the usefulness of any piece of equipment for use in an emergency scenario, particularly those that are airway related, as time is extremely important in determining whether the patient outcome is to be successful.

1. Cook, TM, Woodall, N. Fourth National Audit Project. Major Complications of airway management in the UK. *British Journal of Anaesthesia* 2011; **106**: 617-642
2. Astin, J., King, E. Survey of airway management strategies and experience of non-consultant doctors in ICU in the UK. *British Journal of Anaesthesia* 2012; **109**(5): 821-5
3. Henderson, J., Popat, M. Difficult Airway Society guidelines for management of unexpected difficult intubation. *Anaesthesia* 2004; **59**: 675-694

Emergency airway management in recurrent maxillary osteosarcoma

J. Farrant

Princess of Wales Hospital, Bridgend., jamesfarrant@gmail.com

This is an interesting case of predicted impossible emergency orotracheal intubation, secondary to recurrent osteosarcoma of the maxilla.

Case Report

A 44 year old man presented to the emergency department with a reduced conscious level and respiratory compromise. Two years ago he underwent radical surgery for high-grade chondro-osteosarcoma of the right maxilla. The maxilla, surrounding nasal cavity, muscle, and orbit were removed. Later he developed tumour recurrence, and underwent chemo-radiotherapy. He had recently been discharged from hospital after treatment for an ear infection causing sepsis. A percutaneous gastrostomy was inserted as mouth opening had become limited. On admission he was profoundly hypoxic and responsive to pain on the AVPU scale, soon deteriorating, becoming apnoeic and unresponsive. An arterial blood gas demonstrated hypercarbic respiratory failure (pCO₂ >15.3). Difficult bag-mask ventilation was commenced, with oropharyngeal airway insertion only possible due to missing teeth. Airway assessment revealed fixed mouth opening of 5mm, dried secretions, facial cellulitis, occluded right nostril, and evidence of a previous tracheostomy. Oro-tracheal intubation was predicted to be impossible and we transferred the patient to theatre for intubation. Fiberoptic intubation was performed through the patent left nostril using the Ambu aScope3™ placing an armoured size 6 tracheal tube. The subsequent CT scan demonstrated cerebritis and cavernous sinus thrombosis secondary to infection. The patient was treated on intensive care until further information suggested disease recurrence and the focus of care shifted to palliative.

Discussion

This case demonstrates the challenges associated with treating acutely unwell patients who have previously had major airway and facial surgery. They may present some time after initial treatment, at distant centres, and during unsociable hours. This makes prior planning for airway management difficult, and highlights the importance of regular revision of advanced airway techniques. It also highlights lessons from NAP4 [1] which showed that airway management in remote locations is high risk and best undertaken in a place of safety where difficult airway equipment and skilled staff are available to help.

1. TM Cook, N Woodall, J Harper, J Bengner. Major complications of airway management in the UK: results of the Fourth National Audit Project of the Royal College of Anaesthetists and the Difficult Airway Society. Part 2: intensive care and emergency departments. *British Journal of Anaesthesia* 2011; **106**: 632-642

An evaluation of the advanced airway management equipment at Alder Hey Children's Hospital based on the ADEPT guidance

J. Griffith¹; R. Craig²

¹Alder Hey Children's Hospital, jbrgriffith@doctors.net.uk; ²Alder Hey Children's Hospital, argcraig77@btinternet.com

Methods

Standards were established based on the Difficult Airway Society's Airway Device Evaluation Project Team (ADEPT) guidance¹. The Centre for Evidence-Based medicine hierarchies were used as a reference guide².

—All airway equipment should have level 3b evidence as a minimum

—Evidence should include paediatric studies

A review was carried out of advanced airway management equipment, including the difficult airway trolley, at Alder Hey Children's Hospital. Well established equipment with years of clinical experience such as LMA's and McCoy laryngoscopes were excluded as per ADEPT's advice. All other equipment was included. A literature search was carried out using Google Scholar, in addition to using the evidence list on the ADEPT website, and research provided by manufacturers (VBM, Cook, Karl Storz, and Ambu).

Results

Equipment	Number of Studies and Level of Evidence	Paediatric Studies and Level of Evidence
Bonfils Fibrescope	1 level 3a study 5 level 3b studies 23 level 4 studies 5 level 5 studies Total of 34 studies	1 level 3b study 5 level 4 studies 2 level 5 studies Total of 8 studies
Ambu aScope 3	1 level 3b study 3 level 4 studies 4 level 5 studies Total of 8 studies	No studies
VBM Jet Ventilation Catheter	12 level 4 studies 5 level 5 studies Total of 17 studies	2 level 4 studies Total of 2 studies
Quicktrach	10 level 5 studies Total of 10 studies	1 level 5 study Total of 1 study
Enk Oxygen Flow Modulator	6 level 5 studies Total of 6 studies	2 level 5 studies Total of 2 studies
Manujet	1 level 3b study 3 level 4 studies 5 level 5 studies Total of 9 studies	1 level 3b study Total of 1 study
Guidewire Exchange Technique through LMA	6 level 4 studies 2 level 5 studies Total of 8 studies	6 level 4 studies 2 level 5 studies Total of 8 studies

Discussion

High quality evidence to support the use of equipment for difficult airway management is particularly scarce in paediatrics. Studies involving manikins and animals were classified as level 5 evidence, and regarded as bench studies. The investigators felt that evidence classed as level 4 and above required human subjects.

Only the Bonfil's fibrescope had evidence above the minimum level suggested by ADEPT to support its use in paediatrics. The Manujet is supported by one paediatric study of level 3b evidence, however this was used in an elective setting in combination with a rigid bronchoscope, and therefore a different scenario to its use with a trans-tracheal device as would be the case in a can't intubate, can't ventilate scenario. All other equipment investigated had levels of evidence for paediatric use below the minimum recommended by ADEPT. The guidewire exchange through an LMA had low levels of evidence, however this is a well established technique in paediatrics.

Currently level 3b or higher evidence is not available to support the majority of equipment stocked on the difficult airway trolley. Reviewing the evidence and considering alternatives has not prompted any changes to the advanced airway management equipment at Alder Hey Children's Hospital. This audit will serve as a baseline that can be reviewed as further research becomes available. The ADEPT guidance will be followed for future purchasing decisions.

1. Pandit J, Popat M. The Difficult Airway Society 'ADEPT' Guidance on selecting airway devices: the basis of a strategy for equipment evaluation. *Anaesthesia* 2011; **66**: 726-737.
2. <http://www.cebm.net/oxford-centre-evidence-based-medicine-levels-evidence-march-2009/> [accessed 01/09/2014]

4. A study of awake videolaryngoscope-assisted intubation in patients with peri-glottic tumor

I Hodzovic², L Markova¹, T Luzar¹, J Benedik¹,
T Stopar-Pintaric¹,

¹University Medical Centre Ljubljana, Slovenia, ²Cardiff University and Aneurin Bevan University Health Board, United Kingdom.

Airway management in patients with critical airway obstruction is a high-risk procedure [1]. A number of airway management options have been described [2, 3], but there is no consensus on how best to secure the airway. We report findings from a pilot study of awake intubation using KingVision videolaryngoscope (KingVision VL) in a cohort of 22 patients.

Following approval of the University Medical Centre ethics committee, 22 patients with peri-glottic tumour took part in this study. Patients with mouth opening less than 18 mm and/or presenting with stridor requiring urgent airway management were excluded. 10% Xylocaine and 4% Lignocaine were used for topical anaesthesia of the airway with remifentanyl and midazolam sedation. We recorded success rate, time to intubation (from passing the incisors to the first capnograph trace), number of attempts (removal of VL from the airway and re-insertion) and patient's experience on 100mm VAS scale (0 = very unpleasant, 100 = very pleasant). Failure of the procedure was declared if patient did not tolerate the procedure or if SaO₂ dropped <90%. Intubations were videoed using KingVision VL.

Results

Twenty-two patients with mean (SD) BMI 33(6) kgm⁻², admitted for diagnostic or radical surgery over a period of seven months, took part in the study. Four presented with stridor at rest, two had stridor on lying flat and 16 patients had no stridor.

Table. Main study findings. Values are mean (SD) and number (%) as appropriate. n = 22

Success	1st Attempt Success	Time to Glottic View	Total Time to Intubation
20 (90%)	12 (74%)	19 (5) s	55 (23) s

Two failures were recorded: patients 2 and 11 could not tolerate the procedure due to inadequate topical anaesthesia. Patient 5 was intubated on 3rd attempt with smaller tube size (stridor at rest patient). Mean (SD) patient satisfaction VAS score was 79(29) mm.

Discussion

Awake VL-assisted intubation offers a number of advantages in patients with critical airway obstruction. VL provided wide-angle view, making it possible to accurately identify laryngeal opening often hidden behind the tumour. Furthermore, the advance of the tube was often associated with relief of the obstruction adding to the patient acceptance of the technique. The 'cork-in-a-bottle' effect [2] and blind railroading associated with the use of the fibrescope were avoided with this technique. Lastly, the VL created an airway during intubation allowing for accurate application of atomised local anaesthetic and clearance of the secretions under direct vision. In order to improve patient's acceptance of the technique, meticulous attention should be paid to adequate topical anaesthesia of the airway. Awake VL-assisted intubation could be a useful technique in patients with critical airway obstruction.

References

1. Cook TM, Woodall N, Frerk C. Major complications of airway management in the UK: results of the Fourth National Audit Project of the Royal College of Anaesthetists and Difficult Airway Society. *British Journal of Anaesthesia* 2011;106: 617-31.
2. Patel A, Pearce A. Airway Obstruction. *Anaesthesia* 2011; 66: 93-100.
3. Lambert C, Passant C, Hodzovic I. Awake videolaryngoscope-assisted intubation in a patient with stridor. *European Journal of Anaesthesiology* 2013;30: 258.

Statement of Conflict of Interest

The manufacturers of KingVision videolaryngoscope, Ambu A/S, 2750 Ballerup, Denmark provided KingVision videolaryngoscope, disposable blades and recording cable for this study.

Difficult airway in intensive care patient: Novel use of KingVision videolaryngoscope

S. Arumugam¹; L. Bowen²; I. Hodzovic³

¹Royal Gwent Hospital, sivasundari.a@gmail.com; ²Royal Gwent Hospital, lowribowen@gmail.com; ³Royal Gwent Hospital, Hodzovic@cardiff.ac.uk

Background

This case report highlights challenges of difficult airway management in the intensive care unit. Airway management in this patient was made more difficult by the urgent need to secure the airway, reduced level of consciousness and inability to preoxygenate due to ongoing status epilepticus

Case Report

Thirty-five year old male patient was admitted to the Intensive Care Unit with status epilepticus. Past medical history included epilepsy and learning difficulty. Previous elective surgery record revealed a grade 3 view of the larynx and difficult mask ventilation. He was successfully intubated using McCoy laryngoscope and a bougie. Whilst on intensive care, intubation was required to secure the airway and abate a seizure. Difficult airway equipment was made available and fully checked prior to intubation. Airway management strategy included plan A with Mc Coy laryngoscope and a bougie and plan B with KingVision videolaryngoscope. Modified rapid sequence induction using Thiopentone and Rocuronium with cricoid pressure was performed. First and second attempts at intubation using Mc Coy and Macintosh laryngoscopes failed. The laryngoscope light failed in both case once the tip of the blade was placed in the vallecula, when attempting to obtain a view of the glottis. Re-oxygenation using a facemask and a oropharyngeal airway was difficult requiring two person technique. King Vision videolaryngoscope was used for the third attempt at intubation. Although a view of the glottis was obtained, this attempt also failed despite trialing a bougie as an aid to tube placement. Facemask oxygenation was becoming more difficult so igel was inserted but failed to improve oxygenation. Another attempt with Macintosh laryngoscope (grade 3) and a bougie failed. At this point we used KingVision to obtain a view of glottis and fibrescope to guide the tube placement. The tip of the fibrescope was manoeuvred into the trachea using the KingVision screen resulting in successful intubation.

Discussion

NAP4 highlighted that disproportionate number of serious adverse airway incidents happened in intensive care patients [1_NAP4]. There are a number of learning points in this case report. Firstly, despite pre-warning and planning, unexpected equipment failure can happen. Laryngoscope blade light should be checked with the application of pressure at the tip of the blade. Secondly, there are times when thinking outside the box and combining airway techniques is required to overcome difficulties in complex airway management cases. This combination allows a wider view of the glottis, more space within the airway and easier/quicker fibrescope tracheal placement.

1. Cook TM., Woodall J., Harper J., Benger J. (2011). Fourth National Audit Project of the Royal College of Anaesthetists and Difficult Airway Society. Part 2: intensive care and emergency departments *British Journal of Anaesthesia* 2011; 106(5): 632-642.
2. Yuan YJ, Xue FS, Liao X, Liu JH, Wang Q. Facilitating combined use of an Airtraq® optical laryngoscope and a fiberoptic bronchoscope in patients with a difficult airway. *Canadian Journal of Anaesthesiology*. 2011; 58:584–58.

National survey of anaesthetic departmental responses to NAP4: I dissemination of NAP4, airway leads, departmental organisation and governance

T. Cook¹; N. Woodall²; C. Frerk³

¹Royal United Hospital, Bath, timcook007@gmail.com; ²Norfolk and Norwich Hospital, nicholas.woodall@nuk.nhs.uk; ³Northampton General Hospital, chrisferk261@btinternet.com

Introduction

NAP4 [1] made recommendations to improve practice, including introduction of departmental airway leads [2].

Methods

A survey was sent to all UK NHS hospitals to determine current airway practices and changes relevant to NAP4 recommendations. Following reminders the survey was closed in January 2014.

Results

There were 175 responses from 192 hospitals (61.5% returns). Results are presented as % of respondents. Respondents were as follows airway lead 88%, clinical director 9%, tutor 4%. 99.4% of respondents were aware of NAP4 and its results including reading original papers (61%), reading report online (54%), hospital presentation (35%). Respondents reported an average 3.1 exposures to results and 98% reported this as satisfactory. NAP4 results were presented in 91% of departments. Overall 95% of respondents reported changes in practice in response to NAP4 in their anaesthetic department and 97% reported changes in anaesthesia, intensive care or emergency department practice. Reported changes to departmental practice were: not at all 2%; a little 32%; more than a little 35%; considerably 28%; dramatically 3%. 95% of respondents reported having a departmental airway lead and 4% planned one: 44% changed in response to NAP4. Roles included protocol development (88%), procurement (87%), multidisciplinary training (89%); these roles changed in 50% in response to NAP4. 71% of departments have representation on hospital procurement committees and in 5% this changed in response to NAP4. 49% report a systematic method for ensuring clinicians' competence with new airway equipment and in 14% this changed in response to NAP4. Airway management training includes Human Factors training in 61% of departments and in 24% this changed in response to NAP4. In 65% multidisciplinary teams who manage difficult airways train together and in 26% this changed in response to NAP4. 79% of respondents reported airway management plans are always/often discussed during the WHO check before anaesthesia; 79% always/often and in 28% this changed in response to NAP4. Debriefing following difficult airway management occurs more commonly in 66% of departments than before NAP4.

Conclusions

NAP4 was successfully disseminated and has changed practice in almost all UK hospitals. Gaps in care quality have been reduced - but not closed - in departmental organisation, presence of airway leads and communication around airway difficulty/complications.

Acknowledgements

Thanks to those responding and RCoA staff who supported the survey.

1. Cook TM, Woodall N, Frerk C. Major complications of airway management in the UK: results of the 4th National Audit Project of the Royal College of Anaesthetists and the Difficult Airway Society. Part 1 Anaesthesia. *British Journal of Anaesthesia* 2011; 106: 617-31
2. Cook TM, Woodall N, Frerk C, O'Sullivan E, McNarry A, Drake S, Grocott M. The College Department Airway Lead and NAP4 follow-up surveys: an announcement. *Bulletin of the Royal College of Anaesthetists*. 2012; 76: 37-8

A national survey of videolaryngoscopy availability, introduction and use in UK practice

T. Cook¹; A. Robles²; F. Kelly³

¹Royal United Hospital, Bath, timcook007@gmail.com; ²Royal United Hospital, Bath, arobles@doctors.org.uk; ³Royal United Hospital, Bath, fiona.kelly@doctors.org.uk

Introduction

Videolaryngoscopy (VL) has been available for several years but its penetration into routine use is unknown.

Method

A survey was sent to all UK NHS hospitals to examine current availability and use of VL. Following reminders the survey was closed in January 2014.

Results

184 responses were received from 106 Trusts and 78 hospitals in all deaneries (covering 221 hospitals: 67% response rate): 115 (63%) district general hospitals, 55 (30%) university hospitals, 12 (6%) specialised hospitals, 2 unspecified. Results are presented as % of respondents. Availability of VL by site was main theatre 96%, obstetrics 55%, paediatric anaesthesia 25%, intensive care 58%, emergency department 39%; local independent hospital 16%.

Location	Main Theatres	Obstetrics	Paediatrics	ICU	ED	Local Private hospital
Sites	286	131	61	135	94	34
Airtraq	34%	47%	54%	54%	60%	53%
Glidescope	17%	20%	25%	19%	16%	18%
C-Mac	10%	11%	7%	8%	5%	15%
C-Mac D blade	6%	5%	2%	5%	6%	3%
McGrath 5	6%			3%	3%	3%
McGrath Mac		5%	5%			3%
King VL						£%

In 734 sites where VL was available the commonest devices used were Airtraq 47%, Glidescope 19%, CMac 9%, CMac D-blade 6% and McGrath-5 4%. In all sites examined the commonest devices available were Airtraq, Glidescope and CMac (Table 1). In 28 (15%) of sites VL was available on all sites (Airtraq 79% of these). Use of VL in main theatres was described as (n=165): all intubations 0%; widespread routine use 29%; infrequent routine use 50%; frequent emergency use 28%; infrequent emergency use 35%; rarely used 8%; never used 1%. 90% of 167 respondents stated there was no department policy for use of VL (n=167). VLs were selected by departments as follows (n=164): after a short trial 57%; chosen by airway interested anaesthetist 54%; chosen by airway lead 47%; based on cost 41%; based on published literature 31%; based on formal trial 17%; based on tender process 4%; through personal involvement in trials/device development 4%; dictated by procurement/medical equipment department 3%; via an ADEPT process 2%. VLs were introduced into departments as follows (n=166): informal introduction 36%; informal manikin training 36%; mandatory manikin training 8%; mandatory manikin training with sign off 2%; on-patient training 5%; 'see one-do one-teach one' 4%; no structured introduction 10%. Of 165 respondents 29% were unaware of the DAS videoscope database; 22% did not know whether anyone contributed; 41% knew no one contributed; 9% stated some of the department do contribute.

Discussion

VL is available in the majority of NHS hospitals. A single use device predominates. However access is highly variable; device choice is mostly unstructured; use is highly variable; introduction is haphazard and an opportunity for collecting nationally useful data is being almost completely ignored. The limited availability outside the NHS suggests inequality of practice.

Acknowledgments

We acknowledge all respondents and RCoA staff.

1. Cook TM, Woodall N, Frerk C. Major complications of airway management in the UK: results of the 4th National Audit Project of the Royal College of Anaesthetists and the Difficult Airway Society. Part 1 Anaesthesia. *British Journal of Anaesthesia* 2011; 106: 617-31
2. Frerk CM, Lee G. Laryngoscopy: time to change our view. *Anaesthesia*. 2009; 64: 351-4.

A national survey of anaesthetic departmental responses to NAP4: II changes in anaesthesia practice

T. Cook¹; N. Woodall²; C. Frerk³

¹Royal United Hospital, Bath, timcook007@gmail.com; ²Norfolk and Norwich Hospital, nicholas.woodall@nnuh.nhs.uk; ³Northampton General Hospital, chrisferk261@btinternet.com

Introduction

The 4th National Audit project of the Royal College of Anaesthetists and Difficult Airway Society [1] made numerous recommendations designed to improve anaesthesia practice.

Methods

A survey was circulated to all UK NHS hospitals to determine current airway practice relevant to recommendations. Reminders were sent at intervals. The survey was closed in January 2014.

Results

There were 175 responses representing 192 hospitals (a 61.5% return rate). Not all answered all questions. Results are presented as % of respondents. The greatest impacts on practice were as follows. Extubation 58% of departments have specific guidelines for the management of extubation: in 39% this changed in response to NAP4. Training in management of CICV is undertaken in 92% of departments and in 39% this changed in response to NAP4. CICV training includes surgical cricothyroidotomy in 84% of departments and in 49% this changed in response to NAP4. Capnography is used on all sites for intubation during anaesthesia: always 74%; nearly always 26%; sometimes/never 0% and in 36% this changed in response to NAP4. Intubation training includes interpretation of capnography for all in 79% and in 19% this changed in response to NAP4. Capnography is available in all recovery areas in 44% and in 36% this changed in response to NAP4. 88% have specific tools (e.g. HELP pillows, specific SADs) for management of the obese airway and in 23% this changed in response to NAP4. 93% of hospitals have second generation SADs available for routine and rescue airway management and in 15% this changed in response to NAP4. 95% of departments have an explicit policy for management of difficult or failed intubation and in 13% this changed in response to NAP4. In other areas although respondents reported changes in response to NAP4 current practice falls short of NAP4 recommendations: pre assessment of morbidly obese patients; continuous availability of a awake fiberoptic service, availability of airway equipment for managing paediatric airway emergencies: mandatory paediatric resuscitation training for those who anaesthetise children; documentation of the difficult airway, aspiration risk and airway plans, training for assistants and in recovery.

Conclusions

NAP4 has led to major changes in anaesthetic airway practice. It has led to a 'closing' of the safety gap in many areas of practice. A significant safety gap remains in some areas and further work is required to understand this and work to close it.

Acknowledgements

Thanks to those responding and to staff at the RCoA

1. Cook TM, Woodall N, Frerk C. Major complications of airway management in the UK: results of the 4th National Audit Project of the Royal College of Anaesthetists and the Difficult Airway Society. Part 1 Anaesthesia. *British Journal of Anaesthesia* 2011; 106: 617-31

A national survey of intensive care departmental responses to NAP4: III management of the critically ill in and outside intensive care

T. Cook¹; N. Woodall²; C. Frerk³; J. Bengert⁴

¹Royal United Hospital, Bath, timcook007@gmail.com; ²Norfolk and Norwich Hospital, nicholas.woodall@nnuh.nhs.uk; ³Northampton General Hospital, chrisferk261@btinternet.com; ⁴University Hospitals Bristol, jonathan.benger@uwe.ac.uk

Introduction

NAP4 [1] made recommendations to improve airway management in Intensive Care.

Methods

A survey was sent to all UK NHS hospitals to determine current airway practice relevant to NAP4 recommendations. The survey closed in January 2014.

Results

There were 175 responses representing 192 hospitals (61.5% returns). Results are presented as % of respondents. 80% of respondents reported changes in ICU practice in response to NAP4. Continuous capnography is used in all patients with tracheal tubes: always 68%; often 21%; rarely 9%; never 2% and in 44% this changed in response to NAP4. Capnography is used for intubation on ICU always 79%; often 18%; rarely/never 3% and in 42% this changed in response to NAP4 and for all critically ill patients intubated outside ICU by 71% and in 32% this changed in response to NAP4. Clinical staff on ICU are trained in capnography interpretation; all 52%; some 45%; none 2% and in 34% this changed in response to NAP4. An intubation checklist is used routinely for intubation: always/often 65%; rarely/never 25% and in 42% this changed in response to NAP4. 71% of ICUs have specific plans for management of tracheal tube/tracheostomy displacement/obstruction and in 38% this changed in response to NAP4. 93% of ICUs have immediate access to a difficult airway trolley and in 30% this changed in response to NAP4. The contents of such a trolley mirror those elsewhere in 84% and in 38% this changed in response to NAP4. Planning for airway difficulty and handover of such is performed always/often in 73%; rarely/never in 27% and in 35% this changed in response to NAP4. There is a policy for management of difficult intubation in 90% and in 35% this changed in response to NAP4. A fibrescope is immediately available on ICU in 89% of ICUs and in 15% this is in response to NAP4. Continuous capnography is used during percutaneous capnography always/often in 92% and in 13% this changed in response to NAP4. Trainee medical staff are trained in simple emergency airway management: all 82%; some 16%; none 2% and in 8% this changed in response to NAP4. Trainee medical staff have continuous access to senior medical staff with advanced skills: always/often 99% and in 3% this changed in response to NAP4.

Conclusion

NAP4's recommendations have led to widespread changes in airway practice in the ICU. NAP4 appears to have closed the 'gap' between poor and good care in ICUs by at least 50% and in many aspects considerably more. Changes in use of capnography and planning for failure/complications were most prominent with the closure of the gaps in care exceeding 80%.

Acknowledgements

Thanks to those responding and to staff at the RCoA.

1. Cook TM, Woodall N, Harper J, Bengert J. Major complications of airway management in the UK: results of the 4th National Audit Project of the Royal College of Anaesthetists and the Difficult Airway Society. Part 2 Intensive Care and Emergency Department. *British Journal of Anaesthesia* 2011; 106: 632-42

A national survey of anaesthetic departmental responses to NAP4: IV emergency departments

T. Cook¹, N. Woodall², C. Frerk³, J. Bengner⁴

¹Royal United Hospital, Bath, timcook007@gmail.com; ²Norfolk and Norwich Hospital, nicholas.woodall@nnuh.nhs.uk;

³Northampton General Hospital, chrisferk261@btinternet.com; ⁴University Hospitals Bristol, jonathan.benger@uwe.ac.uk

Introduction

NAP4 [1] made recommendations to improve practice including in the Emergency Department (ED).

Methods

A survey was circulated to all UK NHS hospitals to determine current airway practice relevant to NAP4 recommendations. Reminders were sent at intervals. The survey closed in January 2014.

Results

There were 175 responses representing 192 hospitals (61.5% return rate). Results are presented as % of respondents. Overall 59% of respondents reported changes in practice in the ED in response to NAP4. 73% of EDs have immediate access to a difficult airway trolley and in 30% this has changed in response to NAP4. In 68% of EDs the contents of the airway trolley mirror those elsewhere in the hospital and in 34% this has changed in response to NAP4. A checklist is used for intubations in the ED: always 20%; often 25%; rarely 37%; never 18% and in 29% this has changed in response to NAP4. Trained, skilled assistance for airway management in the ED is present: always/often 86%; rarely/never 14% and in 14% this has changed in response to NAP4. Capnography is used for every ED intubation: always 72%; often 22%; rarely 3%; never 3% and in 27% this has changed in response to NAP4. 88% of respondents reported robust processes to ensure the prompt availability of appropriately skilled, senior staff at any time of day or night for emergency airway management in the ED and in 9% this has changed in response to NAP4.

Conclusions

NAP4's recommendations have led to widespread changes in airway practice in the ED. NAP4 appears to have closed the 'gap' between poor and good care in EDs by at least 50% and in many aspects considerably more. Changes in use of capnography and availability of difficult airway equipment were most prominent. However recommendations such as universal use of capnography for intubation, use of an intubation checklist and availability of difficult airway equipment remain incompletely implemented.

Acknowledgements

Thanks to those responding and to staff at the RCoA.

1. Cook TM, Woodall N, Harper J, Bengner J. Major complications of airway management in the UK: results of the 4th National Audit Project of the Royal College of Anaesthetists and the Difficult Airway Society. Part 2 Intensive Care and Emergency Department. *British Journal of Anaesthesia* 2011; 106: 632-42