What is NAP4?

Executive Summary

While it is generally accepted that airway management may sometimes be problematic and that complications occur, it was not known how frequently these occur or the nature of the events. NAP4 sets out to address this.

The 4th National Audit Project of the Royal College of Anaesthetists and the Difficult Airway Society (NAP4) was designed to answer the questions;

- What types of airway device are used during anaesthesia and how often?
- How often do major complications, leading to serious harm, occur in association with airway management in anaesthesia, in the intensive care units and in the emergency departments of the UK?
- What is the nature of these events and what can we learn from them, in order to reduce their frequency and consequences?

Definitions:

First Generation SADs: SADs which fit the description 'simple airway device'. They have no specific design features to lessen the risk of aspiration in the event of regurgitation.

Second Generation SADs: SADs that have been designed for safety and which have design features to reduce the risk of aspiration.

As a result of the findings a number of recommendations were made. The relevant recommendations regarding second generation SADs have been reproduced within this guide as well as comments on how LMA can help you to meet them.

To access a full copy of the NAP4 report, visit **www.rcoa.ac.uk/NAP4**

Please refer to the Executive Summary, pages 8-10 of the NAP4 report for more details.

Disclaimer: The inclusion of the NAP4 recommendations and LMA products within this guide should not be taken as endorsement of LMA's products by either the Royal College of Anaesthetists or the Difficult Airway Society. This guide is LMA's **own interpretation** of how some of the NAP4 recommendations can be partially or wholly implemented using LMA™ Airway products or services. This is a guide only.

Find out more about second generation SADs

DOCTOR EVIDENCE

For the latest clinical evidence on LMA Supreme™, register for free at **www.doctorevidence.com/lma**

Second Seal Confidence

For more information on LMA Supreme™ and the Second Seal™, visit **www.secondsealconfidence.com**

YouTube

For the latest digital case reports, educational videos and clinician testimonials on the benefits of LMA Supreme™, visit **www.youtube.com/LaryngealMaskAirway**

For the latest news from LMA, like us on **www.facebook.com/LMAInternational**

LMA™ Better by Design

For product information and access to product instructions for use, visit **www.lmaco.com**

References:

4th National Audit Project of the Royal College of Anaesthetists and the Difficult Airway Society: Major Complications of Airway Management in the United Kingdom. Report and findings: March 2011. Editors: Dr Tim Cook, Dr Nick Woodall and Dr Chris Frerk.

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. Br J Anaesth 2011; **106**(5): 617-631.

Cook TM, Howes B. Recent developments in efficacy and safety of supraglottic airway devices. Continuing Education in Anaesthesia Critical Care and Pain 2011; **11**: 56-61.

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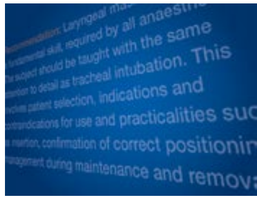
A guide to the national audit project (NAP4) of major complications of airway management in the UK

Report and findings: March 2011. Editors: Dr Tim Cook, Dr Nick Woodall and Dr Chris Frerk. Focus: Second generation supraglottic airway devices (SADs). Published March 2011.



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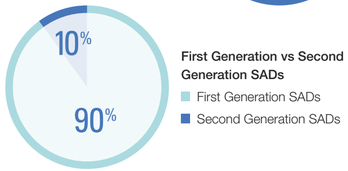
NAP4 project methodology

Phase 1

Phase one of the project established that approximately three million patients are anaesthetised in the UK each year in the NHS and delineated the airway devices used to manage these.

Type of airway device used in an estimated 2.9 million general anaesthetics



Phase 2

Phase two sought to identify all cases of major complications of airway management in the same population as in phase one, but also in intensive care units (ICU) and emergency departments (ED). Each reported case was reviewed by an expert panel to ensure that the correct cases were included and to maximise the amount that could be learnt.

Triggers for inclusion and notification to the project were complications of airway management that led to:

- Death
- Brain damage
- Need for an emergency surgical airway
- Unanticipated ICU admission or prolongation of ICU stay

The project did not collect data on events occurring out of hospital or on hospital wards.

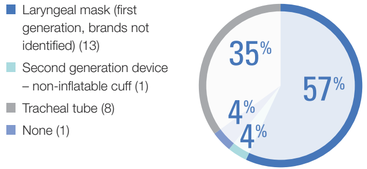
184 cases met the inclusion criteria and were included in the report

Please refer to the Executive Summary, pages 8-10, Chapter 3, page 21 and the results section of Chapter 4, page 25 of the NAP4 report for more details.

Summary of key findings relating to SADs

- Among airway management devices (ETT-FM-SAD) SADs were associated with a lower reported incidence of major airway complications per million than other devices
- Cases of death/brain damage reported to NAP4 were ETT 9.1/million; FM 6.5/million; SAD 5.0/million
- 72% of adverse airway events occurred during anaesthesia
- In 54% of events leading to death or brain damage, the panel judged airway management to be poor
- Aspiration of gastric contents was the primary cause of death/brain damage during anaesthesia
- In all but one case, aspiration via a SAD occurred with a first generation device

Airway device used when aspiration occurred



Aspiration was the most frequent cause of death in the anaesthesia group accounting for 50% (8/16) of deaths and 2 cases of brain damage.

"In many of the aspiration and non-aspiration cases the complication was likely caused by poor judgement, selection of an inappropriate airway device and possibly poor technical use of the device. Review panel assessment indicated a high rate of poor quality care."

Please refer to Chapter 5, pages 31-40, Chapter 7, page 61, Chapter 11, page 86 and Chapter 23, page 187 of the NAP4 report for more details.

Benefits attributed to second generation airways

The NAP4 report attributed a number of benefits to second generation SADs over first generation devices.

Second generation SADs are designed specifically to increase efficacy and safety:

- Improved pharyngeal seal enabling controlled ventilation at higher airway pressures (and hence in a wider range of patients and clinical situations)
- Increased oesophageal seal, which lessens the likelihood of regurgitant fluids entering the pharynx and leading to aspiration
- A drain tube which lies over the top of the oesophagus when the SAD is correctly positioned. This may be used to:
  - Assist insertion
  - Confirm correct device positioning
  - Enable access to the stomach
  - Alert the user to the presence of regurgitation
  - Enable gastric contents to safely bypass the oropharynx and exit the patient
- An integral bite block

"The combination of improved sealing and the presence of a drain tube improves efficacy and creates functional separation of the gastrointestinal tract from the respiratory tract (like an artificial larynx). This is likely to improve safety (though this is very hard to prove) and several recent publications have suggested use of supraglottic airway devices (SADs) with effective drain tubes should become a 'standard of care.'"

"In cases of either moderate obesity (lower compliance for ventilation) or a marginally increased risk of aspiration (low intermediate risk) where a decision is made that intubation is not necessary, there is more logic to using a second generation SAD, than a first generation device."

Please refer to Chapter 11, pages 86-95 of the NAP4 report for more details.

Recommendations: supraglottic airway devices

The NAP4 report made a number of recommendations pertaining to the use of SADs. This guide demonstrates how LMA's products and services can support you in meeting these recommendations.

Recommendation: Laryngeal mask anaesthesia is a fundamental skill, required by all anaesthetists. The subject should be taught with the same attention to detail as tracheal intubation. This involves patient selection, indications and contraindications for use and practicalities such as insertion, confirmation of correct positioning, management during maintenance and removal.

LMA is committed to delivering the highest quality education and training to improve patient care and clinical outcomes. LMA Centres of Excellence courses are led by an independent, international team of distinguished educators and clinicians who offer attendees expert clinical tuition in the use of supraglottic airway devices. Please refer to **www.lmaco.com** for details of current courses.

The LMA clinical evidence portal provides physicians with access to over 1800 clinical papers to support the use of the LMA product portfolio. To register for free, visit **www.doctorevidence.com/lma**

Recommendation: If tracheal intubation is not considered to be indicated but there is some (small) increased concern about regurgitation risk a second generation supraglottic airway is a more logical choice than a first generation one.

LMA Supreme™ is a single use second generation airway with gastric access and an innovative Second Seal™ delivering a new standard of patient care.

LMA ProSeal™ is a re-usable second generation airway offering physicians the peace of mind of gastric access, high seal pressures and patient comfort.

For more information on the Second Seal™, visit **www.secondsealconfidence.com**

For the latest product information, visit **www.lmaco.com**

Recommendation: In patients considered to be at low-risk of aspiration who have other factors that mean that use of a SAD is at the limits of normality (e.g. patient position, access to the airway, patient size) consideration should be given to use of a second generation SAD.

LMA Supreme™ and LMA ProSeal™ have an extensive portfolio of evidence to support their use in more advanced situations, for example, in patients with mild-to-moderate obesity or in more challenging patient positions such as lateral and prone.

"The LMA ProSeal™ currently has the broadest evidence to support its efficacy and safety profile." NAP4 report, Chapter 11, page 93.

The LMA clinical evidence portal provides physicians with access to over 1800 clinical papers to support the use of the LMA product portfolio. To register for free, visit **www.doctorevidence.com/lma**

Recommendation: Tracheal tube and SAD obstruction by the patient biting should be prevented by the insertion of a bite block, an oropharyngeal airway, or the use of SADs with an integral bite block.

Both LMA Supreme™ and LMA ProSeal™ have been designed with integral bite blocks.

Recommendation: In view of the above recommendations, and the frequency of these circumstances, it is recommended that all hospitals have second generation SADs available for both routine use and rescue airway management.

LMA™ airways are available in more than 100 countries via sales teams in the United States, Germany, Italy, Canada, Australia and Singapore, and through independent distributors in other markets.

This extensive distribution network ensures that second generation devices are readily available globally to deliver a new standard of patient care in line with NAP4 recommendations.

For the complete list of recommendations please refer to Appendix 5, pages 208-216 of the NAP4 report.