

CLINICAL PRACTICE

A national survey of the impact of NAP4 on airway management practice in United Kingdom hospitals: closing the safety gap in anaesthesia, intensive care and the emergency department

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Abstract

Background: The 4th National Audit Project of the Royal College of Anaesthetists' and Difficult Airway Society (NAP4) made recommendations to improve reliability and safety of airway management in hospitals. This survey examines its impact.

Methods: A survey was sent to all UK National Health Service hospitals to examine changes in practice in response to NAP4. We performed a 'gap analysis' to determine whether NAP4 had reduced the 'safety gap' between actual and ideal practice.

Results: The response rate was 62% (192 of 307 hospitals), and 78% answered all questions. Most (97%) respondents reported changes in practice in response to NAP4 but these differed by specialty: 95% in anaesthesia; 80% in intensive care (ICU) and 59% in the emergency department (ED). Approximately 25% reported changes in organizational aspects of airway and human factors teaching. Practice changes led to a median closure of the 'safety gap' in anaesthesia of 39% (IQR 14–66%, range 11–83%), 59% in ICU (IQR 54–73%, range 31–81%) and 48% in ED (IQR 39–53%, range 35–53%).

Conclusions: Publication of NAP4 was followed by changes in practice in the majority of responding departments within two yr. Improvements included improved provision of difficult airway equipment and more widespread routine use of capnography. The biggest change occurred in ICU; the impact on training nursing and junior staff was modest and here, significant safety gaps remain.

Key words: airway; anaesthesia; education; emergency department; intensive care

The 4th National Audit Project of the Royal College of Anaesthetists' and Difficult Airway Society (NAP4) examined major complications of airway management in the UK over a period of one yr and was published in 2011.^{1,2} The report made recommendations to improve reliability and safety of airway management in hospitals.³

The project's findings and recommendations were disseminated through a national launch, a full report, journal papers,

media reports, podcasts, lectures and direct contact with project Local Coordinators in all the UK, National Health Service (NHS) hospitals. These resources were also made freely available online (http://www.nationalauditprojects.org.uk/NAP4_home). Whether, and if so the degree to which NAP4 has led to changes in practice has not been reported. This survey examines the success of dissemination and the impact of the recommendations two yr after the publication of the NAP4 report. The survey also set out to

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Editor's key points

- Guidelines improve and standardize practice.
- The safety gap is the difference between observed practice and an ideal practice.
- NAP4 was a UK practice audit resulting in expert recommendations in airway management.
- This survey identifies improvements and opportunities for further change in airway management.

establish current practices and the gap that exists between current airway management practices and ideal practice.

Methods

The survey did not fulfill current NHS definitions of research, and formal approval by a Regional Ethics Committee was not required.

The survey included 62 questions (appendix 1), investigating whether the department had made changes in practice regarding airway governance and training, airway management before during and after anaesthesia, in the intensive care unit (ICU) and in the emergency department (ED). Survey questions asked about practices before the NAP4 report and changes in practice made as a result of the recommendations made in the NAP4 report. Questions were phrased explicitly, aiming to only identify changes in practice made as a direct consequence of NAP4 and to focus on recommendations relating to departmental or institutional practice (as opposed to national or personal practice).⁴

The survey was conducted in conjunction with the Health Service Research Centre (HSRC) of the National Institute of Academic Anaesthesia at the RCoA. The survey was reviewed by the HSRC executive board before distribution, but was not formally piloted. The HSRC's database was used to identify relevant hospitals and survey recipients. An on-line survey was sent by email to all UK NHS anaesthetic department Departmental Airway Leads.⁵ If no response was received the survey was serially sent to the departmental Quality Audit and Research Coordinator (QuARC), Clinical Director and Tutor. The identity of the recipient's hospital was captured to ensure that only one return was received from each hospital. The survey was conducted during 2013 and closed January 2014. Responses were collected independently by HSRC staff who were not further involved in the analysis. The responses were manually checked to ensure that only one response per anaesthetic department was counted, and responses were then de-identified.

Each question in the survey related to a specific recommendation made in the NAP4 report, enquiring about practice before the NAP4 report and changes made as a consequence of the NAP4 report and recommendations. This therefore enabled us to identify the number of departments complying with a particular recommendation before NAP4 and the number changing as a result of NAP4. Based on the assumption that compliance with each NAP4 recommendation improved safety we were able to calculate the following metrics for each recommendation:

Defining A as the percentage compliance with a recommendation before NAP4 and B as the percentage compliance after NAP4.

Previous safety gap = % Safety gap before NAP4 = 100 - A

Current safety gap = % Safety gap after NAP4 = 100 - B

Absolute impact = % change in safety gap = B - A

Relative impact = % closure of the safety Gap = (B - A) / (100 - A) × 100

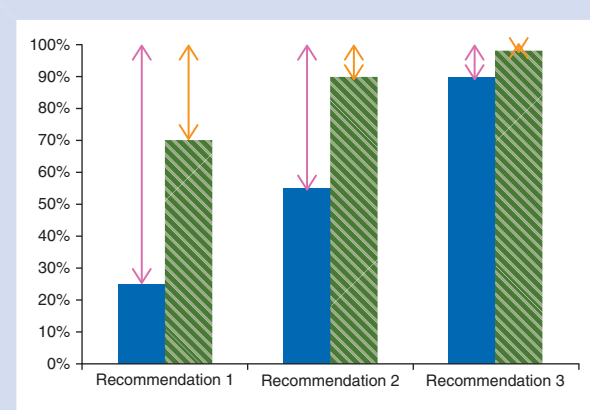


Fig 1 An illustration of closing the safety gap: the 'safety gap' is the difference between practice and 100% compliance with a recommendation. Blue columns represent practice before NAP4 and green columns after NAP4. The difference between the two columns indicates the degree of change. The pink arrow indicates the safety gap before NAP4 and the orange arrow the safety gap after NAP4. The relative lengths of the two arrows indicates the degree to which the safety gap has been closed.

The impact of changes depends on pre-existing practice and the impact of recommendations. This is illustrated in Fig. 1. In Fig. 1 the largest absolute impact was achieved by recommendation one but this is also where the largest remaining safety gap exists. Recommendation two has produced the largest relative impact and for recommendation three there has been a small absolute impact and relative impact but the remaining safety gap is very small.

The survey results were entered into a spreadsheet and descriptive statistics calculated using Microsoft Excel 2010 (Microsoft Cooperation, Redmond, WA, USA). Results are presented as % of respondents.

Results

Surveys were distributed to 307 hospitals assumed to provide surgical services. Some respondents provided data for a group of hospitals: 175 responses were received from 192 hospitals (62% response rate). All 175 respondents replied to questions about organizational aspects and 134–136 answered clinical questions (see appendix).

Respondents were airway leads in 157 (90%) cases. Respondents who were not airway leads were clinical directors 11 (5%), QuARC 2 (1%), Tutor 1 (0.6%) and other consultants with an interest in airway management 5 (3%). All but one respondent (99.4%) were aware of NAP4. The NAP4 results had been presented in 91% of departments. Respondents reported an average 3.1 exposures to results and 98% judged this to be satisfactory.

Changes in overall practice and the role of the airway lead in response to NAP4

Most (97%) respondents reported change in practice in response to NAP4. Respondents were asked to rank the extent of change in their departmental and personal practice. Results are presented in Fig. 2.

Most (95%) respondents reported having a departmental airway lead and 4% planned one; 44% had changed in response to NAP4. Roles of the Departmental Airway Lead included protocol

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