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Guidelines

The ‘NAP5 Handbook’

Concise practice guidance on the prevention and management of accidental awareness during general anaesthesia

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The 'NAP5 Handbook'

Concise practice guidance on the prevention and management of accidental awareness during general anaesthesia

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Summary

The 5th National Audit Project (or NAP5) of the Royal College of Anaesthetists and Association of Anaesthetists was the largest ever study into accidental awareness during general anaesthesia (AAGA). Numerous publications emerged from the project and whereas a comprehensive list of 64 recommendations were made, the full report and associated publications were primarily academic outputs not accessible to all practitioners as a day-to-day ready reference, nor did they provide practical recommendations that individuals could use in their daily practice. The purpose of this publication is to distil and interpret the findings of the 5th National Audit Project into actions that individuals (and organisations) can follow to reduce the risk of accidental awareness.

Key Recommendations

1. All patients should be informed of the risks of general anaesthesia, including the possibility of AAGA, before their surgery
2. When consenting patients, practitioners should use a form of words that proportionately conveys the risks of AAGA
3. Consent for sedation should emphasise that the patient will be awake and therefore may have recall for at least parts of the procedure
4. Practitioners should identify certain situations or certain patient factors as constituting a higher risk for AAGA (including organisational factors such as overbooked or reorganised surgical lists) and highlight these at the WHO premeet/team brief
5. During induction of anaesthesia, practitioners should adhere to suitable dosing of intravenous agent, check anaesthetic effect before paralysis or instrumentation of the airway and maintain anaesthetic administration, including during transfer of patients (which is facilitated by a simple ABCDE checklist)
6. If AAGA is suspected during maintenance (e.g., by patient movement), prompt attention should be paid to giving verbal reassurance to the patient, increasing analgesia, and deepening the level of anaesthesia.
7. For cases requiring paralysis, the minimum dose of neuromuscular blocking drugs (NMBDs) that achieves sufficient neuromuscular blockade for surgery should be used, and the nerve stimulator is an essential monitor to titrate the dosing of NMBDs to this minimum
8. Where total intravenous anaesthesia (TIVA) is used, practitioners should adhere to the relevant recently published guidelines
9. At emergence, practitioners should first confirm that surgery is complete, then ensure NMBDs are adequately reversed before allowing the patient to regain consciousness. Practitioners should then manage the patient experience, particularly during awake extubation, by speaking to the patient
10. Cases of AAGA should be managed using the NAP5 pathway as a guide

What other guidelines are available on this topic

None. Although the NAP5 Report made 64 recommendations, these were presented as conclusions of a large scale academic enquiry and do not constitute any form of practical practice guidance. Otherwise, scattered in the world literature within individual studies relating to AAGA are reasonable suggestions for practice, but these have never been brought together within one national guidance document to form a coherent source of advice.

Why was this guideline developed?

During the dissemination phase of NAP5 it became clear to the NAP5 team and its sponsoring organisations (the Association of Anaesthetists and Royal College of Anaesthetists) that more concise and focused guidance was needed, addressed to anaesthetists facing common problems related to AAGA. It was recognised that, while the intellectual and scientific justification for new ways of working had been presented in a rigorous way by NAP5 within a very large document and a series of publications, this of itself was not useful practice guidance.

How and why does this guideline differ from previous ones?

First, unlike almost any other guidance on AAGA, this guideline emphasises the overriding importance of NMBDs in increasing the risk of AAGA. Other patient risk factors are acknowledged, but advice on managing NMBDs incorporates and extends evidence obtained by NAP5. Second, no previous guidance addresses how to approach consent for general anaesthesia and sedation. This guideline offers forms of words which practitioners can use as a template and adapt for a range of common situations. Third, this guideline presents a precise approach to emergence and reversing NMBDs that has previously not been clearly articulated (but which is based on evidence acquired and presented by NAP5).

This guideline has been endorsed by several national organisations: the Royal College of Anaesthetists, the Association of Anaesthetists, the Safe Anaesthesia Liaison Group and the College of Anaesthesiologists of Ireland.

Introduction

The largest ever study of accidental awareness during general anaesthesia (AAGA) was the 5th National Audit Project (NAP5) of the Royal College of Anaesthetists (RCoA) and Association of Anaesthetists of Great Britain and Ireland (Association). Conducted over a whole calendar year, the project analysed over 300 patient reports of AAGA and made 64 recommendations for practice. The outputs comprised not only the full report (see http://www.nationalauditprojects.org.uk/NAP5home#pt) but also a large number of publications, including an important activity survey that provided denominator data used to help the analysis [1-10].

However, all these are primarily academic outputs not accessible to all practitioners as a day-to-day ready reference. The RCoA and Association identified a need to distil the findings of NAP5 into a format which all members of the anaesthesia team, and others, could use in daily practice. The emphasis is on pragmatic guidance distilled from the report, rather than a scientific justification of each recommendation, which has already been presented within NAP5. The authors, some of whom were members of the original NAP5 panel (JJP, TMC, WJ, JH), together with representatives from the Association (KF, SS, TM) and College of Anaesthesiologists of Ireland (CAI; WJ) reached consensus on the key areas of the NAP5 report findings to emphasise, summarise and at times extend the recommendations, using new evidence that emerged after NAP5 was published. In turn the draft was approved by the respective Councils and Boards of the RCoA, Association, CAI and Safe Anaesthesia Liaison Group (SALG). The summary is presented below under the following sections: consent and preparation for anaesthesia (and sedation); induction and maintenance of anaesthesia; emergence from anaesthesia; managing cases of suspected AAGA; recommendations for national organisations, departments and hospitals.

Extending the findings of NAP5, we have now given clear examples of language that might be used by clinicians in certain circumstances to provide information to patients, or when managing AAGA. The words used might be used as templates to adapt and do not imply that *only* the wording suggested is appropriate, or that it is 'mandatory' to use similar words in all circumstances. Rather, these are examples of what a clinician might suitably say within the context of the example given.

Consent and preparation for anaesthesia (and sedation)

Since NAP5, the Association has issued its detailed guidance on a general approach to consent [11]. This section incorporates that new evidence, and extends the results of NAP5 to focus specifically on the AAGA-related aspects of consent. There are two guiding principles: (a) to provide information on risk, its mitigation and use of appropriate monitoring, and allay anxieties about AAGA; (b) to offer a choice of anaesthetic technique, where possible.

Pre-hospital information (pre-assessment clinic)

General anaesthesia

It is already recommended that patients should be provided with information about their anaesthetic in written form (e.g. leaflet) in advance of their anaesthesia [12]. This should include information relevant to AAGA. The RCoA has, since NAP5, produced specific literature in its series on risks of anaesthesia (see: https://www.rcoa.ac.uk/patientinfo and www.rcoa.ac.uk/accidental-awareness). The degree of detail that can be provided at the pre-assessment clinic may depend upon whether it is nurse- or anaesthetist-led, but in discussion the important points of emphasis should be: (a) AAGA is generally uncommon or rare; (b) the patient will have an opportunity to discuss any specific concerns with their anaesthetist on the day of surgery, before the operation; (c) if anxiety is severe, there should be opportunity made to discuss these concerns with an anaesthetist before the day of surgery.

Sedation

Where it is known or can be anticipated that sedation rather than general anaesthesia is planned, then separate written information should be provided on what is meant by 'sedation'. It should be emphasised that sedation does not equate to unconsciousness and may be associated with recall. A useful guide explaining sedation from the patient's perspective is provided by NAP5, and is adapted in Table 1. This has informed the RCoA's more recent 2018 document 'Sedation Explained' (https://www.rcoa.ac.uk/document-store/sedation-explained), which further extends the results of NAP5. The importance of using the novel language in Table 1 is that it explains what sedation is and what the patient is likely to feel at the different degrees of sedation. In particular, where a patient understands this information, they should not be surprised if they are awake or have recall for parts of the procedure.

Anaesthetic pre-operative visit

Building on recent guidance on consent for anaesthesia [11], this section deals with AAGA-specific aspects of the visit. The pre-operative visit by the anaesthetist who is providing anaesthetic services on the day of surgery is essential and is over and above any prior pre-assessment visit. As recommended elsewhere [13], the visit should take place before arrival in the anaesthetic room or theatre. The visit is an important opportunity for the anaesthetist to establish rapport with the patient, and to understand the patient's frame of mind and allay their specific concerns.

Where a general anaesthetic is planned, the anaesthetist should describe what is to happen from the patient's perspective (e.g. the process of intravenous cannulation, pre-oxygenation, etc). There are many ways to convey this, and different patients will require different emphasis of the many points, but below is a suitable form of words. Note the introduction of the notion that there may be some patchy recall for parts of induction and emergence, which is regarded as normal (hence managing expectations). Note also that the words below do not encapsulate occasions of inhalational induction, so cannot be regarded as prescriptive:

"After you arrive in the anaesthetic room/theatre, we will place monitoring for heart rate, blood pressure and oxygen levels. I will then insert a cannula – a needle in the back of the hand or in the arm – which may feel like a sharp scratch or be briefly painful. Through this I will inject the medicines to anaesthetise you. You may later recall me speaking to you as you 'go to sleep'. A small number of patients briefly feel a tube in the mouth then or as they wake up. You may briefly feel weak and if so, be reassured that this is temporary and an effect of some of the drugs we use."

The patient may then ask about aspects of this process that worry them. Common questions related to AAGA, and suitable responses to them are suggested in Appendix 1.

Preparation for anaesthesia

A large part of prevention of AAGA and its sequelae revolves around risk recognition and mitigation. The advice above is predicated on the patient initiating questions about AAGA. In some situations that are now recognised to constitute a high risk of AAGA, the anaesthetist should consider initiating the discussion. Evidence shows that preparing a patient for the possibility of AAGA manages expectations and mitigates any adverse impact later, should AAGA occur. These instances include, but are not limited to:

(a) whenever neuromuscular blocking drugs (NMBDs) are used (by far the most important risk)
(b) obesity
(c) known or predicted difficult tracheal intubation
(d) where awake extubation methods are planned
(e) general anaesthesia for caesarean section
(f) rapid sequence induction (RSI) of anaesthesia, where neuromuscular blockade is administered before checking for unconsciousness after a prejudged dose of anaesthetic
(g) total intravenous anaesthesia (TIVA) in the presence of neuromuscular blockade (i.e. with NMBDs), especially where non-target controlled infusions are used, or where used for transfer of patients after maintenance with volatile agents
(h) emergency surgery especially in the frail or critically ill, where it may be necessary to limit concentrations of anaesthetic to aid cardiovascular stability
(i) family history or past history of AAGA

In all these circumstances, the anaesthetist may find phraseology such as that in Appendix 1 useful to communicate the risks and allay anxieties.

NAP5 revealed that several human factors were contributory to AAGA events; notably, distractions, fatigue and pressure from within the working environment. Anaesthetists should recognise that the following are common situations where there is a heightened risk of AAGA (and other complications) as a result of human factors:

(a) an overbooked operating list that leads to service pressures for teams. Average operating times (and their variance) for common surgical operations are now easily extracted from operating room data, and widely published in the literature [14]. Even for uncommon operations, surgeon- or team-specific times are widely known [15]. These should be used to schedule an operating list by a rational process [16], and where it is clear that what is booked exceeds the normal capacity of a list, this should be highlighted (e.g. at the WHO team brief) as a tangible risk to patient care
(b) last minute change of theatre staff, or of operating rooms, is highly disruptive and should be formally recognised by the team as such, and this includes changes to cases on an emergency list, which can change frequently and for perfectly valid reasons
(c) discontinuities between anaesthetists preparing and consenting patients for anaesthesia and those conducting anaesthesia later, can mean suboptimal preparation for risks of AAGA

The WHO team brief or pre-meeting takes place before any patient is sent for. While exact content of the brief varies across centres, one of its aims is to allow staff to highlight the main issues from their perspective and share them with the team. This is the opportunity to highlight concerns about AAGA (and other) risks, any additional monitoring that may be needed, or any additional time needed during induction or recovery. This is also the occasion to highlight any concerns with list planning and, where necessary, adjust the list size to ensure safe delivery of anaesthesia.

For each case the anaesthetist should be satisfied that the anaesthetic assistant understands the anaesthetic plans and the specific risks.

Specialised equipment that is needed should be present from the start (e.g. airway equipment, bariatric equipment, processed electroencephalography, EEG – pEEG). Anaesthetists are referred to the relevant guidelines on minimum monitoring and checking of equipment [17-19]. Preparation of drugs is a potentially high risk activity during which distractions should be avoided. Additional caution should be exercised whenever NMBDs are to be used, as inadvertent administration

of NMBDs to an awake patient leads to awake paralysis (interpreted as AAGA) associated with considerable distress and sequelae [2]. Syringes should be labelled, and managed in a way that prevents mis-identification [20]. Anaesthetists should ensure there are systematic processes in their own practice to prevent administration of NMBDs before induction of anaesthesia. If there is a near miss or actual maladministration in their own practice or in the department, they should manage the case expectantly (see below), reflect on the root causes and report the incident to the appropriate safety management systems [21].

Induction and maintenance of general anaesthesia

After preparing for anaesthesia (which includes drug and equipment checking as outlined above), the principles of *induction* needing attention with respect to AAGA include:

(a) suitable dosing
(b) checking anaesthetic effect before paralysis or instrumentation of the airway
(c) maintaining anaesthetic administration, including during transfer into theatre or the intensive care unit

The principles of *maintenance* needing attention with respect to AAGA include ensuring an uninterrupted delivery of anaesthetic ('mind the gap'), and monitoring and titration of drugs.

Induction

Standard induction doses for intravenous agents should be the norm. Deviating greatly from these requires careful thought, justification and, where appropriate, prior explanation to the patient as part of the consent process. Circumstances vary greatly and in some it may not be possible to have any meaningful conversation about AAGA, but an illustration of a suitable form of words that conveys the consequences of planned dose adjustment in a critically ill emergency patient might be:

"Because of your current poor health and need for urgent surgery, I need to be especially careful about how much anaesthetic I give you without it harming you. I will need to give you the lowest effective dose to keep you anaesthetised but this may increase the risk of a brief period of awareness. However this risk will remain low and I will monitor you carefully [describe details; see words in section 1.9 above] to prevent this"

When intentionally using reduced doses of induction agent, the increased risk of AAGA should be recognised. Therefore, where practical, specific depth of anaesthesia monitoring should be used. Patients with an anticipated difficult airway [22] should be considered as higher risk for AAGA. A clear management strategy should be communicated to anaesthesia assistants and, where appropriate, the surgical team. If attempts at securing the airway at or before induction become prolonged, the anaesthetist should decide whether to awaken the patient or to continue with attempts to secure the airway [23]. If the latter, general anaesthesia should be maintained (e.g. using additional intravenous agent). Specific depth of anaesthesia monitoring may be appropriate. Obesity increases the risk of AAGA. In obese patients, dosing of induction agents to total body weight reduces risk of AAGA but can result in cardiovascular instability, whereas dosing to lean body weight better preserves haemodynamic stability but increases the risk of AAGA. Dosing to adjusted body weight may offer a suitable compromise [24,25], supplemented by titrating the dose to hypnotic effect, aided by depth of anaesthesia monitoring where practical.

At induction, the anaesthetist should always confirm loss of consciousness before administering NMBDs or before airway instrumentation by the following (notwithstanding RSI as discussed below):

(a) loss of motor response to command (hence speaking to the patient is important; see Appendix 1; Q3)
(b) loss of response to stimulating manoeuvres such as jaw thrust, prior to laryngoscopy or insertion of any airway device
(c) where depth of anaesthesia monitoring is used, an appropriate monitor output

Rapid sequence induction

The principle of RSI is to administer a prejudged dose of induction agent and, before checking for loss of consciousness, administering a rapidly acting NMBD. This practice is designed to reduce the risk of aspiration but increases the risk of AAGA (6-fold compared with non-RSI induction) [6]. Anaesthetists should exercise caution when using thiopental for RSI. This is particularly the case if they do not regularly use thiopental in other circumstances. In NAP5, one-third of reports during induction involved RSI and in 92% of these, thiopental was used for induction (whereas thiopental was used in only 3% of non-RSI cases) [6]. During RSI it is necessary to have additional doses of induction agent readily available in case of unanticipated prolonged airway management.
General anaesthesia for caesarean section is a recognised high risk for AAGA (~13 times the risk of the general surgical population) [6]. Strategies to reduce the risk during induction (and maintenance) of anaesthesia in healthy parturients (in addition to those above) include:

(a) the use of increased doses of induction agents by weight
(b) rapidly attaining adequate end-tidal volatile levels after induction without delay
(c) use of nitrous oxide in appropriate concentrations
(d) appropriate use of short-acting opiates
(e) after induction, avoid reducing concentration of inhalational anaesthetic agents as a means to preserve or improve uterine tone, as this increases the risk of AAGA and instead use appropriate uterotonic drugs and physical haemostatic measures

Maintenance

Transfer to theatre/patient positioning: 'mind the gap'

Transferring an anaesthetised patient from an anaesthetic room to theatre (and by logical extension all transfers of anaesthetised patients) is a period of risk for AAGA because inevitable interruption of administration of volatile-based anaesthesia can lead to lightening of anaesthesia. NAP5 recommends the anaesthesia team performs an 'ABCDE' checklist after every movement or change in position, to ensure integrity of the airway, adequate breathing, stable circulation, continued drug delivery and team situational awareness (see Appendix 2). This NAP5 ABCDE checklist should be undertaken before surgery starts, and could usefully constitute the anaesthesia-specific component of the WHO timeout.

Anaesthetising patients in the operating theatre avoids interruption of anaesthetic administration after induction. This could usefully be considered for patients judged to be at high risk of AAGA.

Monitoring during maintenance

As recommended in Association guidance issued since NAP5, the presence of a suitably trained anaesthetist is essential throughout anaesthesia [17].

Clinical signs such as tachycardia, hypertension, sweating and lacrimation may be signs of inadequate anaesthesia. Patient movement, particularly in response to command, should be regarded as significant. These should all trigger actions to exclude AAGA, in particular checking for interruptions to anaesthetic agent delivery. However, clinicians should not place undue reliance on 'normality' of physiological variables to exclude AAGA as most cases occur without gross perturbation of physiological signs.

In NAP5, cases of AAGA that occurred during maintenance were more commonly associated with pain than those during induction [6]. If AAGA is suspected during maintenance (e.g., by patient movement), prompt attention should be paid to three things concomitantly: (a) giving verbal reassurance to the patient; (b) increasing analgesia; (c) deepening the level of anaesthesia. A form of words that may be used is: *'You may be feeling something; I am going to make you more comfortable'*. Note that administering further NMBDs should only be considered after attending to these three things.

Where specific depth of anaesthesia monitoring is used, logically it should be applied before induction and continue at least until completion of surgical and anaesthetic interventions, i.e. up to the point where it is intended to awaken the patient. There are currently technical limitations of providing depth of anaesthesia for out of theatre transfer.

In critically ill, frail or high risk patients, appropriate dose reduction may be aided by depth of anaesthesia monitors. However, where this results in very low administered anaesthetic concentrations, caution is required in interpretation of depth of anaesthesia monitor outputs [26]. The isolated forearm technique is a recognised method of monitoring awareness, but requires experience in its use, including in the interpretation of patient responses [27-30]. It should therefore only be used by those suitably trained [31,32]; this also applies to the use of other depth of anaesthesia monitors.

Inadequate anaesthesia during neuromuscular blockade is the prime cause of distressing AAGA and traumatic sequelae [5]. It is therefore logical to minimise the dose of NMBDs. The nerve stimulator is an essential monitor to titrate the dosing of NMBDs to the minimum that achieves sufficient neuromuscular blockade for surgery [33]. This strategy might enable the patient to move to signify awareness, as when no NMBDs are employed.

Where volatile-based anaesthesia (with or without neuromuscular blockade) is used, end-tidal monitoring of the anaesthetic agent, with an alarm turned on, appears a suitable alternative to depth of anaesthesia monitors [34,35]. When using a volatile-based anaesthesia technique, anaesthetists should use end-tidal (or minimum alveolar concentration) alarms, set to avoid low or absent concentrations, to avoid unintentional interruption or under-dosing of agent, and this is now part of minimum monitoring guidance [17].

AAGA is regarded as extremely rare if maintenance concentrations are held > 0.7 minimum alveolar concentration (suitably age-adjusted) [34,35]; deviating greatly below this requires justification and early consideration of specific depth of anaesthesia monitoring.

TIVA, when used with NMBDs, increases the overall risk of AAGA approximately two-fold. This may be increased further with non-target-controlled infusion techniques [6]. When employing TIVA, the following precautions will help minimise the risk of AAGA [17]:

(a) careful checking of selected drug and dosing when pump programming to avoid administration errors. This is particularly the case where multiple infusions are administered
(b) propofol and opioids (e.g. remifentanil) should be clearly labelled, administered via separate infusions and not mixed within the same syringe
(c) where practical, the administration tubing should be visible ideally along its entire length to the point of attachment to the i.v. cannula, and the cannula itself
(d) suitable high pressure and 'end of infusion' pump alarms should be activated (and low pressure alarms if available) to sense obstructions to flow and an empty syringe, respectively.
(e) one-way valves should be used at appropriate points in the giving set, to avoid backtracking of drugs into another line such as an intravenous fluid line
(f) use of specific depth of anaesthesia monitoring if NMBDs are used

Emergence from anaesthesia

In NAP5, AAGA at extubation and during emergence accounted for almost a third of all cases, and experience of paralysis and distress was prominent. Safe emergence involves the following principles:

(a) confirm that surgery is complete before allowing the patient to regain consciousness
(b) ensure NMBDs are adequately reversed before allowing the patient to regain consciousness
(c) managing the patient experience, particularly during awake extubation

Balance between 'anaesthesia' and 'paralysis'

Anaesthetists should never allow a patient to regain consciousness from intended general anaesthesia whilst surgery is ongoing (notwithstanding planned wake-up such as during some

neurosurgical operations), as this is likely to be interpreted by the patient as AAGA, if recalled later. This includes the suturing of drains and any postsurgical or intimate examinations after skin closure. Anaesthetists should never allow the patient to regain consciousness while there is still neuromuscular blockade, as this is also likely to interpreted by the patient as AAGA, if recalled later. NAP5 found that this recall is associated with a high incidence of distress.

Where short-acting anaesthetic agents are used, or those with rapid offset of action, or where low levels of anaesthetic agent have been used for maintenance, this will require maintaining drug delivery up until the end of surgery and until appropriate recovery from neuromuscular blockade.

Confirming the 'end of surgery' and reversal of paralysis

There should be formal confirmation from the surgeon to the anaesthetist and other theatre staff that surgery 'has finished'. This point should denote completion of all interventional procedures and postsurgical examinations.

Anaesthetists should recognise that residual paralysis at emergence is interpreted by patients as AAGA. Therefore, neuromuscular blockade should be appropriately reversed before allowing the patient to regain consciousness. Prolonged paralysis can arise in a number of situations such as plasma cholinesterase deficiency, malnutrition and idiosyncratic responses to certain NMBDs. This can be detected by nerve stimulator monitoring and therefore, if the principle described above is followed, this may require prolongation of anaesthesia considerably beyond the duration of surgery.

As recommended in the Association's minimum monitoring guidelines published after NAP5, the nerve stimulator, which establishes motor capacity, should be employed when NMBDs are used [17]. An adequate response to nerve stimulation (e.g. return of a 'train of four' (ToF) ratio of > 0.9, or another suitable measure) is a minimum criterion for adequacy of motor capacity. As qualitative assessment (i.e. manual detection of ToF or double burst stimulation) cannot detect a difference in ToF ratio of 0.3–0.7 it is likely that quantitative neuromuscular monitoring is required to reliably detect adequate return of motor capacity. Anaesthetists should use additional signs such as spontaneous breathing and signs of spontaneous movement before adequate motor capacity is judged restored [6].

During emergence, speaking to patients to explain what is happening provides important reassurance about potentially unusual sensations such as the presence of a tracheal tube or residual partial paralysis. The form of words will vary greatly with context and the desired emphasis, but a form of words illustrating this is:

"You have had your surgery and are quite safe. You are waking up and there is a tube in your mouth/ throat helping you breathe. You may feel a little weak but that will improve. Once you are breathing well I will remove the tube. This situation is normal"

Speaking to patients in this way is especially important during an awake extubation [36]. The process should be explained to the patient as part of the consent process, including the possibility of recall of the tube in the airway and difficulty in moving or breathing at this time.

Managing cases of suspected AAGA

Patients experiencing AAGA are at risk of developing adverse psychological consequences including post-traumatic stress disorder. A lack of, or insensitive, peri-operative management can compound the long term psychological consequences.

The principles of approach are described by the stages of meeting, analysis and support, and are described in detail in the NAP5 awareness support pack or pathway. This pathway is available at http://www.nationalauditprojects.org.uk/NAP5-Anaesthetia-Awareness-Pathway#pt and is presented in abridged form in Appendix 3. Below we extend the NAP5 conclusions to offer suggestions on specific forms of words which may be suitable in certain situations.

Recognition and initial management

Early identification of AAGA and supportive intervention at the time and after can reduce psychological harm. If AAGA is suspected intra-operatively, the anaesthetist should speak to the patient at the time of the event to provide reassurance that the anaesthetist knows that the patient may be aware and is doing something about it (see above). This applies especially to communication during inadvertent NMBD administration to an awake patient. Example vignettes reported in NAP5 showed that a form of words similar to those below was used; this mitigated later distress:

"[Patient name], I realise you are awake and cannot move. This is because of the effect of one of the drugs given to you. Don't worry; you are quite safe I am helping you with your breathing, though this may feel strange, and I am giving you some anaesthetic drugs so that you will become unconscious very soon".

Meeting stage

The first step after suspected or reported AAGA is, wherever possible, for the (senior) anaesthetist who provided the anaesthesia care at the time to meet the patient. The anaesthetist should listen, be sympathetic and also promise to investigate the cause of why the experience might have happened. Circumstances will dictate many different forms of language to employ but a generic example that is suitably illustrative is:

"I am sorry you have had this experience. What you describe is consistent with what we recognise as accidental awareness during anaesthesia. With my colleagues I will investigate why you might have had this experience and what we can learn from this in order to prevent it from happening again, to you or to another patient."

Analysis stage

At the meeting stage it is important for the patient and the anaesthetist involved that a potential diagnosis of AAGA is verified or excluded. NAP5 provides a methodology for assessing reported cases.

This methodology includes assessing the patient report to help locate any experience to a phase of anaesthesia. For example, a judgement should be made on whether the account is plausible, given what actually occurred during the anaesthesia and surgery. AAGA can occur at induction (the majority of cases), during surgery or at emergence. Independently verifiable (or refutable) experiences such as details of conversations heard, or unusual events that occurred or are claimed to occur are especially important. Cases of AAGA, when investigated, should be graded using the NAP5 classification, by type of report. All classes are mutually exclusive: a patient report can only be classified into one group (Table 2).

It is important to check details of the patient's report. For cases that are certain/probable or possible (Class A/B), causality may be determined by careful analysis of the anaesthetic chart and anaesthetist's report. Some cases have no apparent cause and may be due to insensitivity to anaesthetic drugs.

As NAP5 and other later audits have shown, patients may be mistaken in several ways. They may not have had a general anaesthetic at all; or may have experienced an unpleasant dream not involving specific surgical events. Events during the immediate postoperative or pre-operative period may be incorrectly attributed as intra-operative. Therefore proper analysis is important and any such confusion should be addressed gently, with care and understanding. The degree of evidence supportive or not of the patient story can be graded (Table 3).

Regardless of veracity, the Michigan classification [37] is a means of grading the nature of the experience and can include the addition of D for distress (Table 4). Whereas this Michigan scale reflects the immediate experience, a modified National Patient Safety Association (NPSA) scale was used by NAP5 which graded the longer term degree of psychological harm as a result of AAGA (Table 5).

Together, the approaches in Tables 2–5 can help provide a complete standardised and structured summary from classification type (Table 2), to degree of supporting or refuting evidence (Table 3) to immediate experience (Table 4) and longer term impact (Table 5): see Appendix 4.
The information collected at the meeting stage should be used to undertake an analysis: independent opinion may also be sought. The analysis process may be undertaken by a small group with appropriate skills and knowledge (independent of the hospital if necessary), that can provide an unbiased opinion as to the classification, impact and likely causality.

Support stage

When a case of actual or suspected AAGA arises, signs of impact should be sought early. The patient should be reviewed within 24 hours. This should be in person, although telephone follow-up may be needed if the patient has gone home. Enquiry should be directed to detect the four cardinal signs of impact: (i) flashbacks, (ii) nightmares, (iii) any new anxiety state or (iv) symptoms of depression. If early symptoms are concerning, or if the anaesthetist is unsure of the significance of certain symptoms, or of being able to elicit these, early referral to an appropriate psychologist or psychiatrist is advised.

An equivalent follow up should be conducted at 2 weeks. Even where true AAGA is unlikely, NAP5 has shown that the patient interpretation is of such importance that the impact of peri-operative unpleasant experiences may be severe and psychological support is still needed.

If impact persists, a formal psychological review is needed. Once referral to a psychologist or psychiatrist is deemed necessary, in accordance with National Institute for Health and Care Excellence guidance (https://www.nice.org.uk/guidance/cg26), post-traumatic stress disorder-type reactions should be treated with either trauma-focused 'cognitive behavioural therapy' or 'eye-movement desensitisation and reprocessing'. If there are none of the four cardinal signs of impact, then the patient can be encouraged to make contact if they have later concerns.

An episode of AAGA may trigger a Duty of Candour response (where an unexpected event or error has happened that has caused the patient moderate harm or worse). Where this is the case, local standard practices should be followed.

Recommendations for national organisations, departments and hospitals

This document is primarily a practice guide but it is important to emphasise that NAP5 made several key recommendations to help create and sustain a suitable environment in which the incidence and impact of AAGA can be reduced. All anaesthetists are encouraged, through wider aspects of their practice beyond the operating room, to influence organisations to adopt these.

Relevant anaesthetic organisations should work with the NHS and other public bodies (e.g. the Health Service Executive for Ireland) to develop an ongoing database of AAGA reports using processes similar to those of NAP5, to encourage the process of learning from events, and as an essential basis for further investigation of research questions emanating from NAP5.

There needs to be greater engagement with industry to seek solutions to the problems of drug error created by similar drug packaging and presentation. Hospitals should take ampoule appearance into account to avoid multiple drugs of similar appearance. Hospital policies should direct how this risk is managed and this may require sourcing from different suppliers. Anaesthetists who sit on procurement or local medicines committees may be in a position to influence such decisions.

All anaesthetists should be trained in the maintenance of anaesthesia with intravenous infusions and the relevant anaesthetic organisations should establish a set of standards and recommendations for best practice in the use of TIVA. This recommendation should soon be met by the publication of new national guidelines from the Association and Society of Intravenous Anaesthesia (SIVA-UK), which will need promotion and dissemination. Training in depth of anaesthesia monitoring techniques should also improve so that anaesthetists become familiar with the principles, use and interpretation.

Local versions of the WHO checklist should facilitate: (a) an anaesthesia-specific ABCDE checklist conducted before the start of surgery to confirm (amongst other things) adequate delivery of anaesthesia; (b) formal confirmation by the surgical team with the anaesthetist that it is appropriate to start surgery; (c) formal confirmation by the operating surgeon that surgery and other interventions are complete, so as to allow the anaesthetist to awaken the patient. Since NAP5 the NHS has introduced the concepts of National and Local Safety Standards for Invasive Procedures (NatSSIPs and LocSSIPs, respectively; see: https://improvement.nhs.uk/resources/examples-local-safety-standards-invasive-procedures/). This advice is therefore not designed to expand the WHO checklist to unmanageable proportions, but to be consistent with the philosophy of LocSSIPs.

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References

1. Pandit JJ, Cook TM, Jonker WR, O'Sullivan E. A national survey of anaesthetists (NAP5 baseline) to estimate an annual incidence of accidental awareness during general anaesthesia in the UK. *Anaesthesia* 2013; **68;** 343–53.
2. Jonker WR, Hanumanthiah D, O'Sullivan EP, Cook TM, Pandit JJ. A national survey (NAP5-Ireland Baseline) to estimate an annual incidence of accidental awareness during general anaesthesia as known to anaesthetists. *Anaesthesia* 2014; **69:** 969–76.
3. Jonker WR, Hanumanthiah D, Ryan T, O'Sullivan EP, Cook TM, Pandit JJ. Who operates when, where and on whom? A survey of anaesthetic-surgical activity in the Republic of Ireland as denominator of NAP5. *Anaesthesia* 2014; **69:** 961–8.
4. Sury MRJ, Palmer JHMG, Cook TM, Pandit JJ. The State of UK anaesthesia: a survey of National Health Service activity in 2013. *British Journal of Anaesthesia* 2014: **113:** 575–84.
5. Cook TM, Andrade J, Bogod DG, et al. 5th National Audit Project (NAP5) on accidental awareness during general anaesthesia: patient experiences, human factors, sedation, consent, and medicolegal issues. *Anaesthesia* 2014; **69:** 1102–16.
6. Pandit JJ, Andrade J, Bogod DG, et al. 5th National Audit Project (NAP5) on accidental awareness during general anaesthesia: summary of main findings and risk factors. *Anaesthesia* 2014; 69: 1089–101.
7. Pandit JJ, Andrade J, Bogod DG, et al. 5th National Audit Project (NAP5) on accidental awareness during general anaesthesia: protocol, methods, and analysis of data. *Anaesthesia* 2014; **69:** 1078–88.
8. Sury MJ, Arumainathan R, Belhaj AM, Palmer JHM, Cook TM, Pandit JJ. The state of UK paediatric anaesthesia: a survey of National Health Service Activity. *Pediatric Anesthesia* 2015; **25:**1085–92
9. Sury MR, Palmer JH, Cook TM, Pandit JJ. The state of UK dental anaesthesia: results from the NAP5 Activity Survey. *SAAD Digest* 2016; **32:** 34–6.
10. Palmer J, Sury M, Nightingale C, Pandit J, Cook T. Underestimating the size of the problem? UK anaesthesia for patients with obesity. *Obesity Research & Clinical Practice* 2017; **11:** 703–8.
11. Yentis SM, Hartle AJ, Barker IR, et al. *AAGBI: Consent for anaesthesia 2017*. *Anaesthesia* 2017; **72:** 93–105.
12. General Medical Council. *Consent: Patients and Doctors Making Decisions Together*. GMC: London, July 2008.
13. AAGBI. *Pre-operative Assessment and Patient Information*. AAGBI: London, January 2010.
14. Pandit JJ, Carey A. Estimating the duration of common elective operations: implications for operating list management. *Anaesthesia* 2006: **61:** 768–76.
15. Pandit JJ. Similarity of operation times for common general surgical procedures in the United Kingdom and the United States. *Anesthesiology* 2007; **107:** 512–3.
16. Pandit JJ, Tavare A. Using mean duration and variation of procedure times to plan a list of surgical operations to fit into the scheduled list time. *European Journal of Anaesthesiology* 2011; **28:** 493–501.
17. Checketts MR, Alladi R, Ferguson K et al. Recommendations for standards of monitoring during anaesthesia and recovery 2015: Association of Anaesthetists of Great Britain and Ireland. *Anaesthesia* 2016; **71:** 85–93.
18. Lumb AB, McLure HA. AAGBI recommendations for standards of monitoring during anaesthesia and recovery 2015 – a further example of 'aggregation of marginal gains'. *Anaesthesia* 2016; **71:** 3–6.

19. Checketts MR, Jenkins B, Pandit JJ. Implications of the 2015 AAGBI recommendations for standards of monitoring during anaesthesia and recovery. *Anaesthesia* 2017; **72** (Suppl 1): 3–6.
20. AAGBI. *Syringe Labelling in Critical Care Areas Review* 2014. https://www.aagbi.org/publications/guidelines/syringe-labelling-critical-care-areas (accessed 12/02/2018).
21. Mihai R, Scott S, Cook TM. Litigation related to inadequate anaesthesia: an analysis of claims against the NHS in England 1995-2007. *Anaesthesia* 2009: **64:** 829–35.
22. Pandit JJ, Heidegger T. Putting the 'point' back into the ritual: a binary approach to difficult airway prediction. *Anaesthesia* 2017; **72:** 283–95.
23. Frerk C, Mitchell V, McNarry A, et al. Difficult Airway Society 2015 guidelines for management of unanticipated difficult intubation in adults. *British Journal of Anaesthesia* 2015; **115:** 827–48.
24. Nightingale CE, Margarson MP, et al. Peri-operative management of the obese surgical patient 2015. *Anaesthesia* 2015; **70:** 859–76.
25. Pandit JJ, Cook TM. A reply. *British Journal of Anaesthesia* 2015; **115:** 140–2.
26. Pandit JJ, Cook TM. National Institute for Clinical Excellence guidance on measuring depth of anaesthesia: limitations of EEG-based technology. *British Journal of Anaesthesia* 2013; **110:** 325–8.
27. Pandit JJ. Isolated forearm – or isolated brain? Interpreting responses during anaesthesia – or dysanaesthesia. *Anaesthesia* 2013; **68:** 995–1009.
28. Pandit JJ. Acceptably aware during general anaesthesia: 'dysanaesthesia' – the uncoupling of perception from sensory inputs. *Consciousness & Cognition* 2014; **27C:** 194–212.
29. Pandit JJ. An observational study of the 'isolated forearm technique' in unparalysed, spontaneously breathing patients. *Anaesthesia* 2015; **70:** 1369–74.
30. Wang M, Russell IF, Pandit JJ. The significance of a positive isolated forearm technique response: consciousness or 'dysanaesthesia'? *British Journal of Anaesthesia* 2015: **115** (Suppl): i141.
31. Russell IF. Fourteen fallacies about the isolated forearm technique, and its place in modern anaesthesia. *Anaesthesia* 2013; **68:** 677–81.
32. Sleigh J. The place of the isolated forearm technique in modern anaesthesia: yet to be defined. *Anaesthesia* 2013; **68:** 681–3.
33. Naguib M, Brull SJ, Johnson KB. Conceptual and technical insights into the basis of neuromuscular monitoring. *Anaesthesia* 2017; **72** (Suppl. 1): 16–37.
34. Aranake A, Mashour GA, Avidan MS. Minimum alveolar concentration: ongoing relevance and clinical utility. *Anaesthesia* 2013; **68:** 512–22.
35. Avidan MS, Jacobsohn E, Glick D, et al. BAG-RECALL Research Group. Prevention of intraoperative awareness in a high-risk surgical population. *New England Journal of Medicine* 2011; **365:** 591–600.
36. Popat MT, Mitchell V, Dravid R, Patel A, Swampillai C, Higgs A. Difficult Airway Society guidelines for the management of tracheal extubation. *Anaesthesia* 2012; **67:** 318–40.
37. Mashour GA, Esaki RK, Tremper KK, Glick DB, O'Connor M, Avidan MS. A novel classification instrument for intraoperative awareness events. *Anesthesia & Analgesia* 2010; **110:** 813–15.
38. Cook TM, Pandit JJ. Pitfalls of comparing incidences of awareness from NAP5 and from Brice studies. *British Journal of Anaesthesia* 2015: **115;** 471–2.
39. Bogod D, Plaat F. Be wary of awareness – lessons from NAP5 for obstetric anaesthetists. *International Journal of Obstetric Anaesthesia* 2015; **24:** 1–4.

Appendix 1

Common questions at the pre-operative visit and some suggested form of words

These are not intended to be prescriptive since different situations will require different approaches and language.

We acknowledge that the incidence of AAGA remains controversial. Individual anaesthetists should be aware of the literature and can then choose to cite appropriate incidences based on their interpretation of the literature and how it applies to their particular patient. Those who choose to cite incidences based on Brice questionnaires are likely to cite an incidence of 1 in 600 to 1 in 1000. Conversely those who choose to cite data from NAP5 will describe an overall incidence of 1 in 19,000. Either figure should be used in a way that aims to reassure rather than alarm the patient. The illustrations below (Q being the question and A our suggested response) assume the NAP5 data are used, but the decision as to what to say is the individual anaesthetist's [38].

Situations in which anaesthetists take consent are highly varied, ranging from the setting of a pre-operative clinic where there should be few time constraints, to the seconds or minutes before immediate life-saving surgery. Consent in the special circumstance of a category 1 caesarean section and expected RSI requires particular discretion. Obstetric patients are amongst the highest risk for AAGA, yet an abbreviated discussion of possible sensations during induction and cricoid pressure may be all that is practically achievable [39]. Hence the purpose of these examples is to offer elements of language and content that readers may adapt or modify for a given situation.

Q1 ***"How common is awareness?"***
A1 *"Awareness is uncommon and in the largest study on the subject,1 patient in every 19,000 spontaneously reported awareness after a general anaesthetic."*

Q2: ***"Can you guarantee that I will be asleep?***
A2.1: *if not using NMBDs: "Almost all cases of awareness occur when drugs that temporarily paralyse muscles are used. For your anaesthetic, I am not using these so awareness is extremely rare; probably less than 1 in 130,000."*

A2.2: *if using NMBDs: "Awareness is uncommon. For your anaesthetic, I am using the class of drugs that temporarily paralyse muscles but I will be using a monitor to help me use the minimum dose necessary. I will also be using other monitoring [describe end-tidal agent monitoring and/or pEEG-based monitors, as necessary] that will help me ensure sufficient anaesthetic drugs are in your body."*

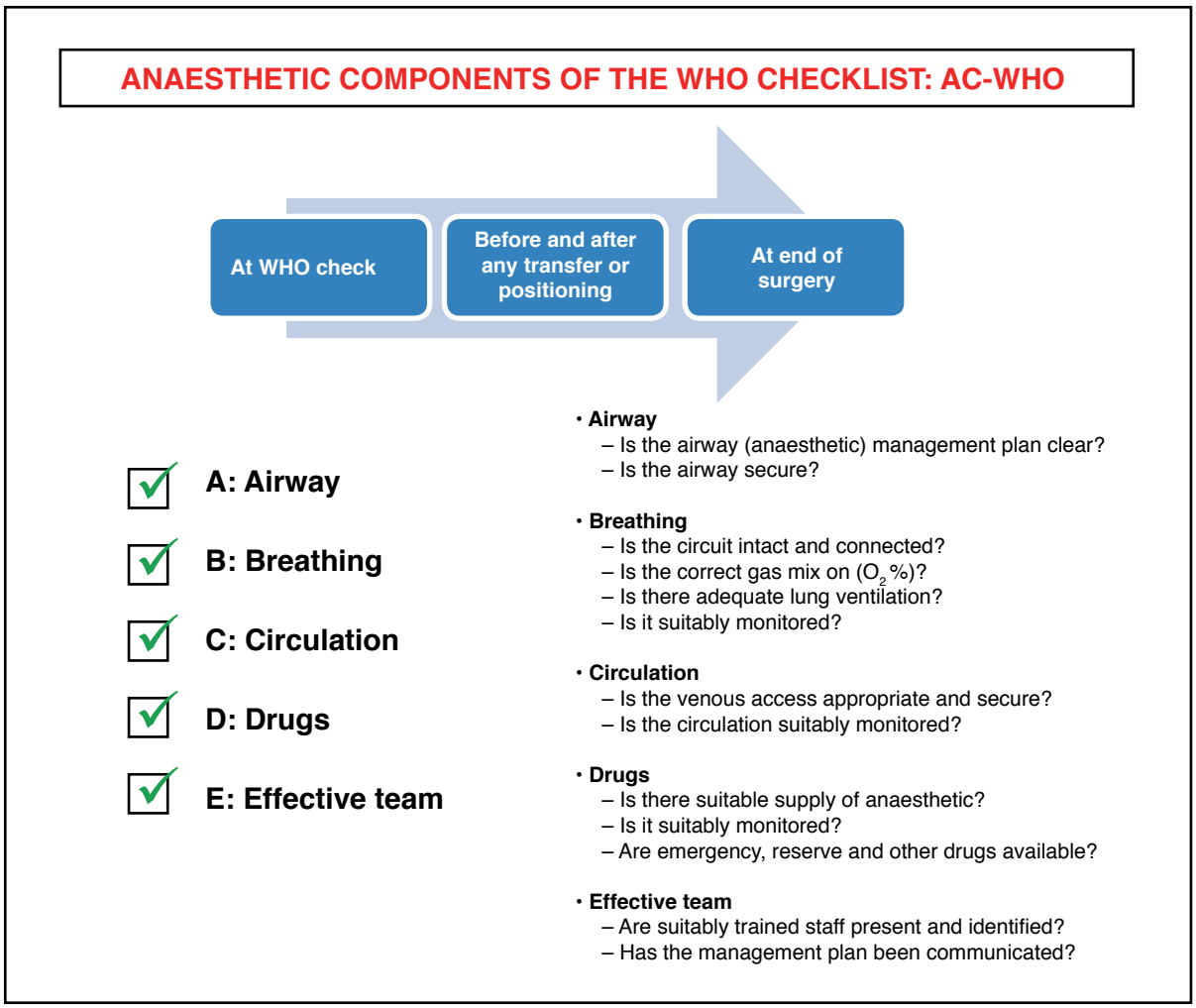
Q3: ***"How do you know I am asleep?"***
A3.1: *if not using NMBDs: "Awareness is extremely rare. I will be using doses of drugs known to maintain anaesthesia and will be with you throughout surgery and monitoring you closely so I can detect any minor movements your body makes. Especially as you become unconscious or emerge from surgery, and at other times, I may ask you to open your eyes, move your arm or squeeze my hand, as this helps confirm to me that you are anaesthetised."*

A3.2: *if using NMBDs: "Awareness is uncommon. I will be using doses of drugs known to maintain anaesthesia and will be with you throughout surgery and monitoring you closely. I will also be using other monitoring [describe nerve stimulator, end-tidal agent monitoring and/or pEEG-based monitors, as necessary] that will help me ensure sufficient doses of anaesthetic drugs are in your body. Especially as you become unconscious or emerge from surgery, and at other times, I may ask you to open your eyes, move your arm or squeeze my hand, as this helps confirm to me that you are anaesthetised."*

Q4: ***"If I am aware what will it feel like?"***
A4: *"The largest study into awareness showed that in about half of cases there was no pain or distress, and memories were of very briefly hearing something or feeling something, for example a tube in the mouth. It is in fact quite normal to feel this as you wake up, and also to recall an oxygen mask over your face as you go to sleep or wake up. If awareness does occur it is usually for events before surgery or after surgery, at times when your anaesthetist is getting you 'off to sleep' or 'waking you from sleep'. I will be giving you strong pain killing drugs while you are asleep. I will visit you afterwards and ask you if everything was all right. If at that time you have recalled any pain, weakness or distress, please let me know. If you only remember something much later please feel free to contact me via the department."*

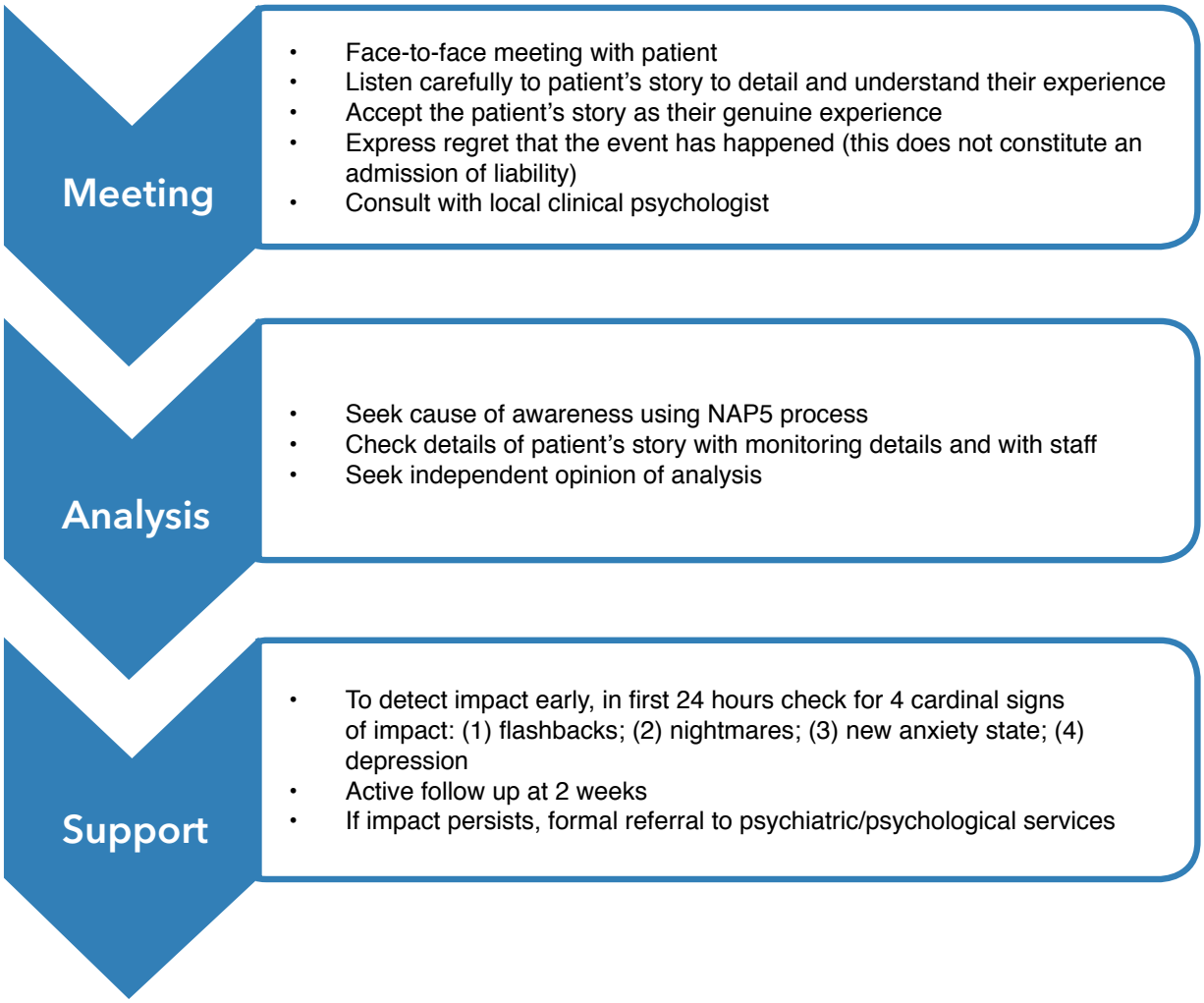
Appendix 2

The ABCDE check to be performed at the end of each transfer of an anaesthetised patient (e.g. from anaesthetic room to operating theatre). Reproduced with permission from the NAP5 Report (http://www.nationalauditprojects.org.uk/NAP5report).



Appendix 3

The NAP5 support pathway. Reproduced with permission from the NAP5 Report (http://www.nationalauditprojects.org.uk/NAP5report).



Appendix 4

Summary of the 3-step NAP5 support pathway which can be used to manage a case of AAGA.

Step 1 Meeting

Patient ..... Supporter .....

Date ..... Time .....

Anaesthetist 1 ..... Anaesthetist 2 .....

Other .....

Brief description of report

Patient experience

Michigan Class: Modified NPSA Class:

Initial consequence for patient:

Explanation to patient:

Apology to patient? Yes/No

By whom .....

Datix form completed? Yes/No

Has duty of candour been discharged, if appropriate? Yes/No

Referred to clinical psychologist/psychiatrist early? Yes/No

Date for review .....

Person to review .....

Appendix 4

Summary of the 3-step NAP5 support pathway which can be used to manage a case of AAGA.

Step 2 Analysis

Patient ..... Supporter .....

Date ..... Time .....

Anaesthetist 1 ..... Anaesthetist 2 .....

Type of report .....

NAP5 Class: Grade of evidence:

Brief description of report

Contributory and causal factors:

Contributory factore	Contributory	Casual	Mitigating
Communication (includes verbal, written an non-verbal: between individuals, teams and/or organisations			
Education and training (e.g. availability of training)			
Equipment/resource factors (e.g. clear machine displays, poor working order, size, placement, ease of use)			
Medication (where one or more drugs directly contributed to the incident			
Organisation and strategic (e.g. organisational structure, contractor/agency use, culture)			
Patient (e.g. clinical condition social/physical/ psychological factors, relationships)			
Task (e.g. includes work guidelines/procedures/policies, availibility of decision making aids)			
Work and environment (e.g. poor/excess administration, physical envirnment, work load and hours of work, time pressures)			
Other			
Unknown			

Preventability – how might it have been prevented, if at all?

Lessons learnt:

Departmental actions:

Individual actions:

Summary of the 3-step NAP5 support pathway which can be used to manage a case of AAGA.

Step 3 Support

Patient ..... Supporter .....

Date ..... Time .....

Anaesthetist 1 ..... Anaesthetist 2 .....

Other .....

Inpatient review or follow up telephone consultation for day cases is essential within 24 hours

	24 hours	1 week	2 weeks
Flashbacks			
Education and training (e.g. availability of training)			
Nightmares			
New anxiety state			
Symptoms of depression			
Other			

Referred to clinical psychologist/psychiatrist Yes/No

Who .....

When .....

Further actions:

Table 1. Guidance on the forms of words to use when consenting a patient for sedation (modified from NAP5 Report).

	What will this feel like?	What will I remember	What's the risk related to the sedation drugs?
Not sedated; awake	I am awake, possibly anxious. There may be some mild discomfort (depending on what I am having done)	Everything	Nearly zero
Minimal sedation	I am awake and calm. There may be some mild or brief discomfort	Possibly everything	Very low risk
Moderate sedation	I am sleepy and calm but remain in control. I may feel some mild discomfort	I might remember some things	Low risk
Deep sedation	I am asleep. I will not be in control	Probably very little	Higher risk. My breathing may slow when I am asleep – and I may need help to breathe – a tube might be inserted into my nose, mouth or (rarely) windpipe. I will need oxygen and special monitoring

Table 2. Classification used by NAP5 to categorise cases of AAGA which can be used in the investigation and description of new cases.

Class	Definitions for NAP5
A. Certain/probable AAGA	A report of AAGA in a 'surgical setting' in which the detail of the patient story is judged consistent with AAGA, especially where supported by case notes or where report detail is verified
B. Possible AAGA	A report of AAGA in a 'surgical setting' in which details are judged to be consistent with AAGA or the circumstances might have reasonably led to AAGA, but otherwise the report lacks a degree of verifiability or detail. Where uncertain whether a report described AAGA, the case should be classified as possible rather than excluded
C. Sedation	A report of AAGA where the intended level of consciousness was sedation
D. ICU	A report of AAGA from a patient in, or under the care of, the intensive care unit, who underwent a specific procedure during which general anaesthesia was intended
E. Unassessable	A report where there was simply too little detail submitted to make any classification possible
F. Unlikely	Details of the patient story are deemed unlikely or judged to have occurred outside the period of anaesthesia or sedation
G. Drug error	Syringe swaps and drug errors leading to brief awake paralysis
SO. Statement only	A patient statement describing AAGA, but there were no case notes available to verify, refute or examine that claim further

Table 3. Grading of the quality of evidence used to support (or refute) a case of AAGA, as used by NAP5.

High quality	Where the report of AAGA is confirmed by other evidence
Circumstantial	Where the report of AAGA is supported only by clinical suspicion or circumstance
Plausible	Where other evidence was available, but this does not shed further light on the matter
Unconfirmed	Where there was no evidence other than the patient
Implausible	Where there is no evidence other than the patient story and where this is judged implausible

Table 4. The Michigan classification of patient experience recalled at time of report of AAGA.

Class 0	No accidental awareness during general anaesthesia
Class 1	Isolated auditory perceptions
Class 2	Tactile perceptions (with or without auditory)
Class 3	Pain (with or without tactile or auditory)
Class 4	Paralysis (with or without tactile or auditory)
Class 5	Paralysis and pain (with or without tactile or auditory)

Table 5. Modified NPSA scale as used by NAP5 to reflect longer term psychological harm as a result of AAGA.

Severity	**Revised definitions for NAP5**
None 0	No harm occurred
Low 1	Resolved or likely to resolve with no or minimal professional intervention. No consequences for daily living, minimal or no continuing anxiety about future healthcare
Moderate 2	Moderate anxiety about future anaesthesia or related healthcare. Symptoms may have some impact on daily living. Patient has sought or would likely benefit from professional intervention
Severe 3	Striking or long-term psychological effects that have required or might benefit from professional intervention or treatment: severe anxiety about future healthcare and/or impact on daily living. Recurrent nightmares or adverse thoughts or ideations about events. This may also result in formal complaint or legal action
Death 4	Caused death

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