

Risks associated with your anaesthetic

# Section 8: Accidental awareness during general anaesthesia

## Summary

This leaflet explains what accidental awareness is during an anaesthetic. During a general anaesthetic your anaesthetist decides how much anaesthetic you need to keep you unconscious during your procedure. He/she then monitors your condition throughout the procedure.

Accidental awareness occurs when the patient becomes conscious during a general anaesthetic and can remember things that happened. This is rare, but it can be very distressing. This article tells you more about how it can occasionally happen, what steps are taken to prevent it, and what to do if you think it has happened to you.

## What is accidental awareness?

Accidental awareness is becoming conscious when the anaesthetist intended you to be unconscious. The majority of patients who become accidentally aware do not feel any pain, but may have memories of events in the operating theatre. Dreaming around the time of an operation is very common (6 in 100 patients) but this is not awareness. Some patients recall events from the recovery room after their operation and can be reassured that this is not accidental awareness.

## A new study of accidental awareness

In 2014 the Royal College of Anaesthetists and the Association of Anaesthetists of Great Britain and Ireland published a very large study of accidental awareness during general anaesthesia.<sup>1</sup> For a period of a year, staff in all NHS hospitals in the UK and Ireland were asked to tell the doctors running the study about all





## Section 8: Accidental awareness during general anaesthesia

new reports of accidental awareness made by patients. During this time over 3 million general anaesthetics were given in these hospitals. This very large study has provided new information about accidental awareness.

This study is the fifth National Audit Project produced by the RCoA and is generally known as National Audit Project 5, or NAP5. The researchers hope that lessons from NAP5 will lead to a reduction in the likelihood of accidental awareness and improved management when it occurs. Further information about NAP5 is available via the following website:

[www.nationalauditprojects.org.uk/NAP5home](http://www.nationalauditprojects.org.uk/NAP5home).

### How and why does accidental awareness happen?

Your anaesthetist is present throughout the whole of your anaesthetic. He/she aims to ensure that you are receiving enough anaesthetic to keep you unconscious, but not so much that you suffer serious side effects. The side effects vary between patients, but generally increase as more anaesthetic is given. They include falling blood pressure, reduced breathing and other complications. Therefore the anaesthetist must make a judgment about how much anaesthetic to give.

In about half of anaesthetics, anaesthetists use a muscle relaxing drug as part of the anaesthetic. These drugs stop your breathing and your anaesthetist uses a ventilator (breathing machine) to do the breathing for you. For some operations these drugs are essential as they allow the surgeon access to parts of your body that he/she could not reach without muscle relaxants. Patients who have had muscle relaxants cannot move to indicate that they are not receiving enough anaesthetic.

In addition, if the equipment that delivers the anaesthetic to your body is malfunctioning, the anaesthetist may take a few minutes to understand exactly what is wrong. During this time awareness can happen. So equipment failure is sometimes part of the cause of accidental awareness.

### How likely is accidental awareness?

This is a controversial topic and a matter of debate amongst anaesthetists. Studies have been done in two ways to help work out how likely it is.

#### **Patient reports of accidental awareness**

NAP5 is a study that aimed to find all patient reports of accidental awareness over a period of time.<sup>2</sup> This study identified an incidence of new reports of accidental awareness of around 1 in 20,000 patients after a general anaesthetic.

#### **Interview studies**

The commonest type of study used to determine the frequency of accidental awareness uses a standardised interview which is performed repeatedly after an anaesthetic (for up to two weeks). Studies using this method include interviews with many thousands of patients. They suggest that around 1 or 2 per 1,000 patients having an anaesthetic experience some degree of awareness.<sup>2,3,4</sup>



## Section 8: Accidental awareness during general anaesthesia

### What does it feel like if it happens to me?

The commonest sensation during awareness is a very brief recall of some event during anaesthesia or surgery, such as something inserted into the mouth or someone talking or movement. More serious is the feeling of inability to move – or paralysis. This is a consequence of anaesthetic drugs and is temporary. It will resolve at the end of anaesthesia. Hearing noises and feeling touch is reported by around one third of patients who report accidental awareness. Pain is felt by 1 in 5 patients who report accidental awareness.

Half of patients who report accidental awareness find the experience distressing, most commonly because they feel pain or paralysis or both.

Most reported episodes of awareness are short. Three-quarters of those who experience accidental awareness have an experience that lasts less than five minutes.

Around two thirds of episodes occur before surgery starts or after it finishes – during the process of the anaesthetist 'sending you to sleep' or 'waking you up'. In the remaining one third of reports, the awareness happens during the operation, although pain is not always felt, due to the use of very strong pain relief medicines.

### Are there any long-term effects?

NAP5 found that four in every ten patients who reported accidental awareness experienced long-term effects. Other studies vary, finding this to occur more or less frequently.<sup>5,6</sup> Long-term effects include anxiety, sleep disturbances, flashbacks and nightmares. In a minority of patients, a post-traumatic stress disorder develops. Not surprisingly, patients who report accidental awareness may be anxious or fearful of general anaesthesia should another anaesthetic be needed.

### If I think I have been aware, what should I do?

Most patients who think they have been accidentally aware are correct. You should not hesitate to raise it.

You will benefit from talking to an anaesthetist about it and understanding how it might have happened. Your anaesthetist will want to know that it has happened. You can contact your original anaesthetist or any anaesthetist through the anaesthetic department at your hospital. If you are still in hospital you can ask your nurses to make contact. If you are already at home, you or your GP can contact the anaesthetic department at the hospital. If you would like to speak to someone independently, you can also contact the Patient Advice and Liaison Service (PALS) at your hospital or your GP.

Studies have shown that some people do not realise that they have been aware until several days later – or even longer. You can report the fact that you think you have been aware days or months later.



## Section 8: Accidental awareness during general anaesthesia

The anaesthetist who conducted the anaesthetic, or another anaesthetist, will talk to you. He/she will ask you to describe exactly what you remember. He/she will talk to you about your memories and try to work out what has happened. If you have been aware when you should not have been aware, the anaesthetist will explain to you how this might have happened. You should expect to be treated sympathetically and openly.

It can be helpful to see a psychologist or psychiatrist who has experience of working with people who have had similar experiences. The anaesthetic team can set this up for you. You will also be offered details of how to contact the psychology services so that you can contact them in the future. Help is also available on the internet.<sup>7,8</sup>

NAP5 has produced an Accidental Awareness Patient Support Pathway, which provides a standardised way for patients to be supported after they report accidental awareness. This can be accessed via the following website: [www.nap5.org.uk/NAP5-Anaesthesia-Awareness-Pathway](http://www.nap5.org.uk/NAP5-Anaesthesia-Awareness-Pathway).

### Can accidental awareness be avoided?

If you do not have a general anaesthetic, then you cannot be accidentally aware. Not all operations require a general anaesthetic. Many operations can be carried out using a local or regional anaesthetic to numb part of the body. You can find out more about these anaesthetics in the booklet *Anaesthesia explained* on the College website ([www.rcoa.ac.uk/documents/anaesthesia-explained](http://www.rcoa.ac.uk/documents/anaesthesia-explained)). Your anaesthetist will be able to tell you if these anaesthetics are suitable for you.

If you have a local or regional anaesthetic, you can consider whether you are going to be fully awake or sedated. Your anaesthetist will talk to you about this. Sedation can be used to reduce unpleasant sensations, create a sensation of calmness and make procedures more comfortable. It is not the same as general anaesthesia, as you are not unconscious.

### How does the anaesthetist aim to prevent accidental awareness?

The anaesthetist stays with you throughout your operation. Deciding how much anaesthetic to give is a key role during this time. The anaesthetist uses a variety of monitors which provide information about how much anaesthetic is being given and how your body is responding to anaesthesia and surgery. The anaesthetist uses this monitoring equipment, along with his/her knowledge and skills, to judge whether you are having the right amount of anaesthetic.

### Equipment checks

Problems with anaesthetic equipment can cause awareness. Your anaesthetist will check all equipment at the start of every day to ensure it is functioning properly. Anaesthetic training includes how to react very quickly if equipment malfunctions occur. Back-up equipment and drugs are available at all times.



## Section 8: Accidental awareness during general anaesthesia

### Brain activity monitors

Monitors designed to detect accidental awareness by analysing brain activity have been developed and tested.<sup>9,10,11,12</sup> In some circumstances these monitors may help reduce the possibility of accidental awareness, particularly in patients who are at higher risk. However, they have not been shown to prevent accidental awareness completely. At present, these monitors are not in routine use in UK hospitals. The National Institute for Health and Care Excellence (NICE) published guidance on their use in the UK in 2012.

### If I have had an episode of awareness, is it more likely to happen during my next anaesthetic?

For the majority of people the answer is no. If your first episode was caused by a problem delivering anaesthetic to you, such as an equipment problem or human error, you will not be at increased risk.

For a minority of patients you may be at an increased risk during your next anaesthetic. It is likely a small minority of patients have some resistance to anaesthetic drugs and may need an increased dose.

It is very important that you tell your anaesthetist about your previous episode of awareness. This will help him/her judge the right amount of anaesthetic for you throughout your operation.

### Risk factors: are there any circumstances in which awareness is more or less likely?

NAP5 identified a number of situations in which the risk of accidental awareness is increased. These include:

#### Patient factors

- Aged 25–45.
- Obesity.
- Women.

#### Types of surgery

- Obstetrics (especially caesarean section).
- Cardiac (heart) surgery.
- Thoracic (chest) surgery.

#### Clinical settings

- The use of muscle relaxant drugs.
- Anaesthetics given in an emergency.
- Operations performed out of hours.



## Section 8: Accidental awareness during general anaesthesia

The most important risk factor is the use of a muscle relaxant drug. Most cases of accidental awareness leading to longer term distress occur in people who have received muscle relaxants. Anaesthetists will avoid muscle relaxants whenever it is possible and safe to do so.

Some studies report that if you are very ill, awareness is more common.<sup>1</sup> Very ill patients are more likely to have a low blood pressure and anaesthetics can decrease the blood pressure further, which may cause harm (e.g. heart attack or stroke). In these circumstances, there is a fine balance between too much and too little anaesthetic. The anaesthetic will be carefully adjusted to try and ensure that you are safe and also unconscious. However, the risk of you being accidentally aware is increased.

The risk of accidental awareness is increased in obstetric operations (for childbirth). This is because there is a need to minimise the dose of anaesthetic drugs to reduce effects on your unborn child, and surgery starts very soon after you are unconscious.

The risk of accidental awareness is increased in cardiac and thoracic surgery. In these operations, muscle relaxants are essential and many patients have other risks to consider due to their general health. Both these circumstances lead to an increased risk of accidental awareness. Your anaesthetist will have knowledge of this and will make particular efforts to avoid accidental awareness.

Some studies suggest that if you take certain medications you will require more anaesthetic. These include alcohol (prolonged, heavy use), some types of sleeping tablets and morphine-like drugs. It is very important that you inform the anaesthetist of all your regular medications and how much alcohol you drink.

While these risk factors may cause some concern, you can be reassured that your anaesthetist is well informed about them and will do whatever they can to keep you safe.

### References

- 1 Pandit JJ et al. A national survey of anaesthetists (NAP5 Baseline) to estimate an annual incidence of accidental awareness during general anaesthesia in the UK. *Anaesth* 2013;**68**:343–353.
- 2 Sebel PS et al. The incidence of awareness during anesthesia: A multicenter United States study. *Anesth Analg* 2004;**99**:833–839.
- 3 Sandin RH et al. Awareness during anaesthesia: a prospective case study. *Lancet* 2000;**355**:707–711.
- 4 Pollard et al. Intraoperative awareness – a review of three years' data. *Anesthesiol* 2007;**106**:269–274.
- 5 Moerman N, Bonke B, Oosting J. Awareness and recall during general anesthesia. *Anesthesiol* 1993;**79**:454–464.
- 6 Jones JG. Perception and memory during general anaesthesia. *Br J Anaesth* 1994;**73**:31–37.
- 7 Post-traumatic Stress Disorder. *RCPSYCH*, London ([bit.ly/2eXw2wj](http://bit.ly/2eXw2wj)).
- 8 Post-traumatic Stress Disorder. NHS Choices, London ([bit.ly/1EhotC6](http://bit.ly/1EhotC6)).
- 9 Myles PS et al. Bispectral index monitoring to prevent awareness during anaesthesia: the B-Aware randomised controlled trial. *Lancet* 2004;**363**:1757–1763.
- 10 Avidan M et al. Anesthesia awareness and the bispectral index. *New Engl J Med*;**358**:1097–1108.
- 11 Practice advisory for intra-operative awareness and brain function monitoring. Task force report. *Anesthesiol* 2006;**104**:847–864.
- 12 Depth of anaesthesia monitors – Bispectral Index (BIS), E-Entropy and Narcotrend-Compact M. NICE, London 2012 ([www.nice.org.uk/dg6](http://www.nice.org.uk/dg6)).



## Section 8: Accidental awareness during general anaesthesia

### Further information

Anaesthetists are doctors with specialist training who:

- discuss the type or types of anaesthetic that are suitable for your operation. If there are choices available, your anaesthetist will help you choose what is best for you
- discuss the risks of anaesthesia with you
- agree a plan with you for your anaesthetic and pain control
- are responsible for giving your anaesthetic and for your wellbeing and safety throughout your surgery
- manage any blood transfusions you may need
- plan your care, if needed, in the intensive care unit
- make your experience as calm and pain free as possible.

### Common terms

**General anaesthesia** – This is a state of controlled unconsciousness during which you feel nothing and may be described as ‘anaesthetised’.

**Regional anaesthesia** – This involves an injection of local anaesthetic which makes part of your body numb. You stay conscious or maybe sedated, but free from pain in that part of your body.

You can find out more about general and regional anaesthesia in the patient information booklet *Anaesthesia explained*, which is available from the College website via:

[www.rcoa.ac.uk/documents/anaesthesia-explained](http://www.rcoa.ac.uk/documents/anaesthesia-explained)

### Risks and probability

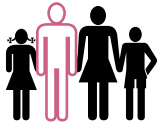
In modern anaesthesia, serious problems are uncommon. Risk cannot be removed completely, but modern drugs, equipment and training have made anaesthesia a much safer procedure in recent years.

The way you feel about a risk is very personal to you, and depends on your personality, your own experiences and often your family and cultural background. You may be a ‘risk taker’, a ‘risk avoider’, or somewhere in between. You may know someone who has had a risk happen to them, even though that is very unusual. Or you may have read in the newspapers about a risk and be especially worried about it.



## Section 8: Accidental awareness during general anaesthesia

People vary in how they interpret words and numbers. This scale is provided to help.



**Very common**

1 in 10

One person in your family



**Common**

1 in 100

One person in a street



**Uncommon**

1 in 1,000

One person in a village



**Rare**

1 in 10,000

One person in a small town



**Very rare**

1 in 100,000

One person in a large town

Your anaesthetist will give you more information about any of the risks specific to you and the precautions taken to avoid them. There are some rare risks in anaesthesia that your anaesthetist may not normally discuss routinely unless they believe you are at higher risk. These have not been listed in this leaflet.

You can find more information leaflets on the College website [www.rcoa.ac.uk/patientinfo](http://www.rcoa.ac.uk/patientinfo)

### Author

Professor Tim Cook, Clinical Lead for the NAP5 Project, Bath

### Reviewed 2017

This leaflet has been reviewed by the RCoA Patient Information Group which consists of patient representatives and experts in different areas of anaesthesia.

## Tell us what you think

We welcome suggestions to improve this leaflet. If you have any comments that you would like to make, please email them to [patientinformation@rcoa.ac.uk](mailto:patientinformation@rcoa.ac.uk)

Royal College of Anaesthetists  
Churchill House, 35 Red Lion Square, London WC1R 4SG  
020 7092 1500

[www.rcoa.ac.uk](http://www.rcoa.ac.uk)

@RCoANews

### Revised Edition 2017

This leaflet will be reviewed within five years of the date of publication.

© Royal College of Anaesthetists (RCoA)

This leaflet may be copied for the purpose of producing patient information materials. Please quote the original source. If you wish to use part of this leaflet in another publication, suitable acknowledgement must be given and the logos and branding removed. For more information, please contact us.