

Risks associated with your anaesthetic

SECTION 3: SHIVERING

At the end of your operation, you will be taken to the recovery room. Staff in the recovery room will be with you at all times and will continue to monitor your blood pressure, oxygen levels, pulse rate and temperature. Some people shiver during this period. This article gives you information about shivering after an operation, and how it can be prevented and treated.

Shivering after an operation is a very common problem. It can cause a great deal of discomfort.

'It was incredibly frightening, I felt so cold and I didn't know what to do or how to stop it. I thought something must be dreadfully wrong'

Although it can be extremely distressing, shivering is not usually dangerous¹ and should stop within 20 to 30 minutes. It can occur after a general anaesthetic and during or after a regional anaesthetic (for example, an epidural or spinal).

What causes it?

Most shivering after an operation is due to a fall in your core (central) body temperature.^{2,3} This occurs because parts of your body may be exposed to a cool environment during your operation. Anaesthetic drugs and gases can contribute to this fall by reducing your body's natural ability to regulate your own temperature. Epidural and spinal anaesthetics open up blood vessels to the skin. This increases blood flow to the skin and increases heat loss.

Shivering may also occur without a fall in core body temperature. It can be caused by anaesthetic drugs and gases, and is more likely if you have pain following your operation.⁴

What is done to prevent it?

Care is taken to keep you warm before, during and after your operation. If you are kept warm before your operation, you are less likely to be cold afterwards. There are some things that you can do to help you stay warm before your operation:⁵

- ▶ Remember that the hospital may be colder than your own home.
- ▶ Bring warm clothing, such as a dressing gown, to keep you comfortably warm before your operation.
- ▶ Tell the staff if you feel cold at any time during your hospital stay.

By keeping warm before your operation, you can help avoid shivering afterwards.

Depending on the length and type of your operation, your anaesthetist and recovery nurses may use some other ways to keep you warm. These can include heating any intravenous fluids that you may receive and using a heated blanket filled with warm air.⁵

How often does shivering happen?

Shivering following an operation is a very common problem. Even using measures to

prevent a fall in body temperature, shivering may still occur in up to 1 in 4 patients following a general anaesthetic.⁶ The risk of shivering is increased in younger patients and during long operations and orthopaedic operations.⁷ Shivering may also be more common when epidural or spinal anaesthesia is used.³

What can be done if shivering occurs?

When you get to the recovery room, your temperature will be measured. If you are cold, the nurses will use warming blankets to help warm you up again. This is usually all that is required to stop shivering, although it may take some time for your temperature to return to normal.

There are also a number of drugs which can be used to treat shivering, although it is usually considered best to wait until the shivering stops on its own. None of the drugs is 100% effective and all may have side effects. The most effective drugs include pethidine, clonidine and doxapram.⁸ If you are in pain following your operation, treatment of your pain may also help to reduce your shivering.

Shivering will stop on its own and, although distressing, it is generally not dangerous. It does, however, increase your body's requirement for oxygen so you may be given additional oxygen via a mask.

A nurse will be with you at all times in the recovery room and they will make sure that you are warm and as comfortable as possible following your operation. When you are ready to drink, hot or warm drinks are a good idea, as they will help to warm you up.

If you have suffered from post-operative shivering in the past this does not indicate that you will shiver with surgery and anaesthesia in the future.

Authors

Dr Elizabeth Read, FRCA
Anaesthetic Specialist Registrar
University Hospital Southampton
NHS Foundation Trust

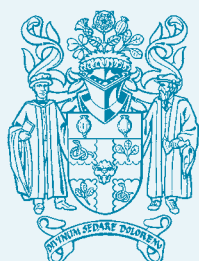
Dr Lucy A White, MA, MRCP, FRCA
Consultant Anaesthetist
University Hospital Southampton
NHS Foundation Trust

Editor

Dr Tim Smith, MD FRCA
Consultant Anaesthetist
Alexandra Hospital, Redditch
Final FRCA Examiner

References

1. Alfonsi P. Post anaesthetic shivering. Epidemiology, pathophysiology and approaches to prevention and management. *Drugs* 2001;**61**:2193–2205.
2. Crowley LJ et al. Shivering and Neuraxial Anaesthesia. *Reg Anesth Pain Med* 2008;**33**:241–252.
3. Buggy DJ, Crossley AWA. Thermo-regulation, mild peri-operative hypothermia and post anaesthetic shivering. *Br J Anaesth* 2000;**84**:615–628.
4. Horn EP et al. Postoperative pain facilitates non thermoregulatory tremor. *Anesthesiology* 2002;**96**:467–484.
5. Perioperative Hypothermia (Inadvertent). National Institute for Health and Clinical Excellence, Clinical Guideline 68, published April 2008.
6. Horn EP et al. Non thermoregulatory shivering in patients recovering from desflurane or isoflurane anesthesia. *Anesthesiology* 1998;**89**:878–888.
7. Eberhart LHJ et al. Independent Risk Factors for Postoperative Shivering. *Anesth Analg* 2005;**101**:1849–1857.
8. Kranke P et al. Pharmacological treatment of postoperative shivering: A quantitative systematic review of randomised controlled trials. *Anesth Analg* 2002;**94**:453–460.



**The Royal College of
Anaesthetists**

The Royal College of Anaesthetists

Revised edition 2013

The material from this article may be copied for the purpose of producing information materials for patients. Please quote the RCoA as the source of the information. If you wish to use part of the article in another publication, suitable acknowledgement must be given and the RCoA logo must be removed. For more information or enquiries about the use of this leaflet please contact:

The Royal College of Anaesthetists

website: www.rcoa.ac.uk

email: comms@rcoa.ac.uk

This leaflet will be reviewed three years from the date of publication.