

Understanding NICE guidance

Information for people who use NHS services

Reducing the risk of brain injury after a cardiac arrest by controlled cooling

NICE 'interventional procedures guidance' advises the NHS on when and how new procedures can be used in clinical practice.

This leaflet is about when and how controlled cooling of the body's temperature can be used in the NHS to reduce the risk of brain injury after a cardiac arrest. It explains guidance (advice) from NICE (the National Institute for Health and Clinical Excellence).

Interventional procedures guidance makes recommendations on the safety of a procedure and how well it works. An interventional procedure is a test, treatment or surgery that involves a cut or puncture of the skin, or an endoscope to look inside the body, or energy sources such as X-rays, heat or ultrasound. The guidance does not cover whether or not the NHS should fund a procedure. Decisions about funding are taken by local NHS bodies (primary care trusts and hospital trusts) after considering how well the procedure works and whether it represents value for money for the NHS.

NICE has produced this guidance because the procedure is quite new. This means that there is not a lot of information yet about how well it works, how safe it is and which patients will benefit most from it.

This leaflet is written to help people who have been offered this procedure to decide whether to agree (consent) to it or not. It does not describe the procedure in detail – a member of your healthcare team should also give you full information and advice about this. The leaflet includes some questions you may want to ask your doctor to help you reach a decision. Some sources of further information and support are on the back page.

What has NICE said?

Controlled cooling of the body's temperature can be offered routinely as a treatment option to reduce the risk of brain injury after a cardiac arrest provided that doctors are sure that:

- wherever possible the patient understands what is involved and agrees to the treatment, and
- the results of the procedure are monitored.

In an emergency, healthcare professionals may give treatment immediately, without obtaining informed consent, when it is in the patient's best interests.

This procedure may not be the only possible treatment. Your healthcare team should talk to you about whether it is suitable for you and about any other treatment options available.

Reducing the risk of brain injury after a cardiac arrest by controlled cooling

The medical name for this procedure is 'therapeutic hypothermia following cardiac arrest'.

The procedure is not described in detail here – please talk to your doctor for a full description.

Cardiac arrest (when the heart suddenly stops beating) leads to loss of consciousness and death unless emergency resuscitation is given and the heart restarted. Some people may develop neurological problems because of the lack of oxygen to the brain before the heart is restarted.

This procedure involves cooling the unconscious person's body temperature from 37°C to between 32°C and 34°C soon after the cardiac arrest and for 12 to 24 hours afterwards. The idea is to cool the brain in the hope of slowing down and limiting the processes that cause brain damage, although doctors do not know exactly how the cooling works in protecting the brain.

The person's body temperature is checked throughout the procedure, usually using a special probe. As well as cooling, patients will be treated and monitored in critical care, and they will be sedated and given muscle relaxants (to prevent shivering). After the cooling period, the person is warmed up gradually until their temperature has returned to normal.

What does this mean for me?

NICE has said that controlled cooling is safe enough and works well enough for use in the NHS. If your doctor thinks it is a suitable treatment option for you, they should still make every attempt to make sure your family and/or carers understand the benefits and risks.

They may want to ask the questions below

- What does the procedure involve?
- What are the benefits?
- How good are the chances of getting those benefits? Could having the procedure make things worse?
- Are there alternative procedures?
- What are the risks of the procedure?
- Are the risks minor or serious? How likely are they to happen?
- What happens if something goes wrong?
- What may happen if the patient doesn't have the procedure?

Summary of possible benefits and risks

Some of the benefits and risks seen in the studies considered by NICE are briefly described below. NICE looked at 21 studies on this procedure.

How well does the procedure work?

A review of 5 studies involving 481 patients reported that overall, significantly more patients who had cooling survived to be discharged from hospital compared with patients who had standard critical care.

Studies involving a total of 810 patients reported that when they were assessed at up to 6 months later, patients treated by cooling had significantly better neurological functioning than patients who had standard critical care.

As well as looking at these studies, NICE also asked expert advisers for their views. These advisers are clinical specialists in this field of medicine. The advisers said that success factors include survival, reduced long-term neurological problems, independent living, quality of life and a shorter critical care and hospital stay.

Risks and possible problems

In a study of 986 patients who had cooling, 35 had a severe bacterial infection called sepsis and 407 had pneumonia after the procedure. The review of 5 studies involving 481 patients reported higher rates of sepsis and pneumonia in patients who had cooling, but the difference was not significant. Patients who had cooling had lower than normal levels of phosphate in their blood (a condition called hypophosphataemia), and higher rates of bleeding and severe heart rhythm disorders than patients who had standard care, but again, the difference was not significant. The study of 986 patients also reported that 44 needed a blood transfusion.

You might decide to have this procedure, to have a different procedure, or not to have a procedure at all.

A study of 61 patients (in which 20 had haemofiltration, which filters toxins and excess fluid out of the blood, and 20 had cooling plus haemofiltration) reported that 5 patients in each group were found to have low levels of potassium in their blood 6 months after the procedure.

In a study of 64 patients, 34 were cooled using gel pads and 30 were cooled using cooling blankets and ice. One patient in the gel pads group experienced a reduction in platelet numbers called thrombocytopenia, due to being given heparin (putting them at risk of bleeding) and 2 patients in the blankets and ice group had gastrointestinal bleeding. This study also reported that approximately 5 patients in each group had a seizure.

As well as looking at these studies, NICE also asked expert advisers for their views. These advisers are clinical specialists in this field of medicine. The advisers said that problems include blood vessel and blood clotting problems, skin damage from the cooling, heart rhythm disorders, infections, shivering, blood chemistry problems, and inflammation of the pancreas. In theory other problems could include intestinal obstruction, liver failure and kidney failure.

More information

Your local patient advice and liaison service (usually known as PALS) may also be able to give you further information and support. For details of all NICE guidance, visit our website at www.nice.org.uk

About NICE

NICE produces guidance (advice) for the NHS about preventing, diagnosing and treating different medical conditions. The guidance is written by independent experts including healthcare professionals and people representing patients and carers. They consider how well an interventional procedure works and how safe it is, and ask the opinions of expert advisers. Interventional procedures guidance applies to the whole of the NHS in England, Wales, Scotland and Northern Ireland. Staff working in the NHS are expected to follow this guidance.

To find out more about NICE, its work and how it reaches decisions, see www.nice.org.uk/aboutguidance

This leaflet is about 'therapeutic hypothermia following cardiac arrest'. This leaflet and the full guidance aimed at healthcare professionals are available at www.nice.org.uk/guidance/IPG386

*You can order printed copies of this leaflet from NICE publications (phone 0845 003 7783 or email publications@nice.org.uk and quote reference N2483). The NICE website has a screen reader service called *Browsealoud*, which allows you to listen to our guidance. Click on the *Browsealoud* logo on the NICE website to use this service.*

We encourage voluntary organisations, NHS organisations and clinicians to use text from this booklet in their own information about this procedure.