NHS
National Institute for Health and Clinical Excellence

Understanding NICE guidance

Information for people who use NHS services

Laser surgery to bypass blocked arteries and aneurysms in the brain without temporarily stopping blood flow

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 a laser-assisted technique which bypasses blocked arteries and aneurysms in the brain without temporarily stopping blood flow can be used in the NHS. 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 problems with arteries that supply the brain, or the procedure, in detail – a member of your healthcare team should also give you full information and advice about these. 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.

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What has NICE said?

There is not a lot of evidence about how well this procedure works or how safe it is. If a doctor wants to use this procedure to treat blocked or ballooned arteries that supply the brain, they should make sure that extra steps are taken to explain the uncertainty about how well it works, as well as the potential risks of the procedure. This should happen before the patient agrees (or doesn't agree) to the procedure. The patient should be given this leaflet and other written information as part of the discussion. There should also be special arrangements for monitoring what happens to the patient after the procedure.

A team of doctors including a neurosurgeon and a radiologist with expertise in treating neurological conditions should decide which patients are most suitable for this procedure.

NICE may look at this procedure again if more information becomes available.

This procedure may not be the only possible procedure for bypassing blocked arteries and aneurysms in the brain. Your healthcare team should talk to you about whether it is suitable for you and about any other options available.

Laser surgery to bypass blocked arteries and aneurysms in the brain without temporarily stopping blood flow

The medical name for this procedure is 'laser-assisted cerebral vascular anastomosis without temporal arterial occlusion'. The procedure is not described in detail here – please talk to your specialist for a full description.

Arteries in the brain can occasionally become narrowed and blocked. These arteries can also become weakened and 'ballooned' – this is called an aneurysm. Blockages and aneurysms of these arteries can cause serious damage to the brain when blood flow is compromised. Ideally, the defect is repaired without disrupting blood flow in the brain. However, this is not always possible. In these cases, one way of maintaining blood flow is by using a spare section of vein from elsewhere in the body to link to the abnormal artery beyond the point of blockage or the aneurysm. This is called bypass surgery. Normally during this procedure, blood flow needs to be stopped temporarily while the new vessel is being attached to the opened brain artery. However, stopping blood flow, even temporarily, can put the patient at increased risk of serious problems, including stroke and brain damage.

The new procedure aims to carry out the bypass surgery without stopping blood flow in the artery. This is done by stitching the new vessel to the unopened wall of the brain artery with blood still flowing through it, and only then opening the join between the vessels using a special laser device. This may reduce potential problems for patients. The procedure is carried out under a general anaesthetic.

What does this mean for me?

If your doctor has offered you this procedure to bypass blocked arteries and aneurysms in the brain, they should tell you that NICE has decided that the benefits and risks are uncertain. This does not mean that the procedure should not be done, but that your doctor should fully explain what is involved in having the procedure and discuss the possible benefits and risks with you. You should only be asked if you want to agree to this procedure after this discussion has taken place. You should be given written information, including this leaflet, and have the opportunity to discuss it with your doctor before making your decision.

You may want to ask the questions below

- What does the procedure involve?
- What are the benefits I might get?
- How good are my chances of getting those benefits? Could having the procedure make me feel 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 care will I need after the operation?
- What happens if something goes wrong?
- What may happen if I don't have the procedure?

Summary of possible benefits and risks

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

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

How well does the procedure work?

In a study of 77 patients with brain artery aneurysms, the procedure worked in all but 2 patients. In these 2 patients, the artery wall did not detach properly from the tip of the laser. The procedure also had to be repeated in 8 patients because a blood clot developed in the replacement artery. In another study the procedure worked in 10 out of 11 patients who underwent the procedure to treat blocked arteries.

Two other studies looked at more than 100 patients. About 80 of these patients were able to carry out everyday tasks after the procedure. In one of these studies which looked at 34 patients, the majority experienced no decline in their improved ability to perform everyday tasks for more than 3 years after the operation was performed.

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 of the procedure can be assessed by looking at whether the new vessel remains unblocked after the procedure, as well as whether bleeding is avoided during the operation.

Risks and possible problems

The number of deaths occurring after the procedure was looked at in four separate studies. About 1 month after the procedure, a total of 6 deaths had occurred out of 127 patients who had the operation.

In another study, 77 patients underwent the procedure to treat brain aneurysms. Brain damage occurred in 22 patients after the procedure. This damage was caused by reduced blood flow in 16 patients, bleeding in 4 patients and other problems in 2 patients.

A study of 15 patients who underwent the procedure to treat blocked arteries reported that 3 patients had a stroke caused by an interruption to the blood supply in the brain. Two patients had speech problems and weakness on the right side of the body after the procedure.

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 possible problems from this procedure include damage to the wall of the blood vessel and leakage from the new vessel.

More information about brain aneurysms and other problems with arteries in the head

NHS Direct online (www.nhsdirect.nhs.uk) may be a good starting point for finding out more. Your local Patient Advice and Liaison Service (PALS) may also be able to give you further advice and support.

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 'Laser-assisted cerebral vascular anastomosis without temporary arterial occlusion'. This leaflet and the full guidance aimed at healthcare professionals are also available at www.nice.org.uk/IPG252

You can order printed copies of this leaflet from NICE publications (phone 0845 003 7783 or email publications@nice.org.uk and quote reference N1468).

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

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