East Kent Hospitals University NHS Foundation Trust

Carotid endarterectomy

Information for patients from the Vascular Surgery Service

This leaflet tells you about the operation known as **carotid endarterectomy**; it explains what is involved before, during, and after your operation. It also explains what possible risks there are and how you can help to make your operation a success. We would particularly ask you to read the sections headed **Is the treatment safe?, What do I do if I feel unwell at home?,** and **What should I do before I come into hospital?**.

This leaflet is not meant to replace the information discussed between you and your doctor but can act as the starting point for this or as a useful reminder of the key points.

What is the problem?

Every day many people suffer a stroke (CVA). Some have short-lasting warning signs of a stroke (a mini stroke or TIA), and these patients are at a high risk (one in five) of having another, perhaps major or fatal stroke.

All patients with an increased risk of stroke are given medical treatment plus advice to reduce this risk. This includes stopping smoking and treatment of diabetes, high blood pressure, high cholesterol, and heart disease. In addition, clopidogrel and a “statin” (a drug to lower cholesterol) are usually prescribed.

In some patients, surgical treatment is also recommended. In such patients, like yourself, there has been found on your tests a narrowing of a main artery in your neck (carotid artery) that supplies blood to your brain. This is due to hardening of your arteries (atherosclerosis) where your arteries become furred up inside, reducing the flow of blood.

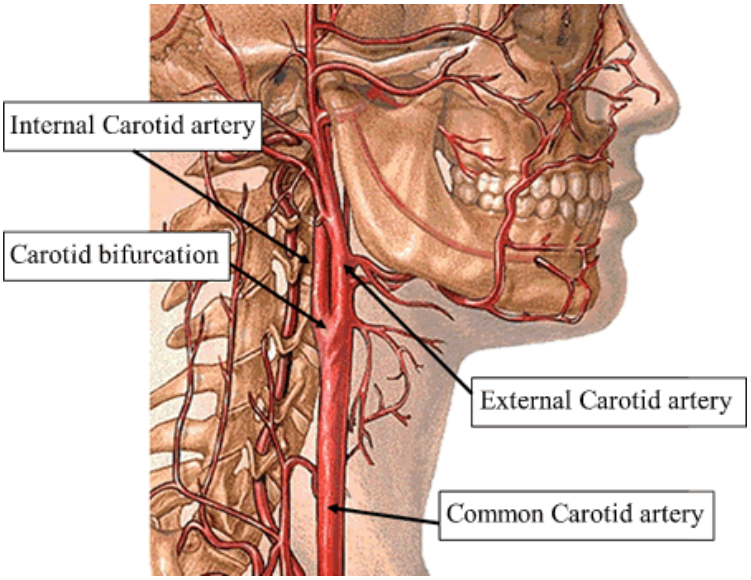
It is important to realise that the left side of the brain looks after the right side of your body and visa versa.

We care

What are the carotid arteries?

The carotid arteries are situated on either side of your neck and supply oxygenated blood to your brain and face.

The picture to the right shows the position of the arteries on the right hand side of the neck and identifies that just below the level of the jaw the common carotid artery divides into two branches. The external carotid artery feeds blood to the face and the internal carotid artery feeds blood into the brain.



What is carotid endarterectomy?

The operation is undertaken on the side of your neck opposite to the side of your body which symptoms of stroke/TIA have been on. A cut is made on the neck to expose the carotid artery, which is temporarily clamped off and opened. A plastic tube (shunt) can be inserted to allow blood to flow to your brain whilst the diseased lining of the artery is removed.

The shunt is then removed and the artery is stitched closed, incorporating a special fabric patch made of Dacron to try to stop future narrowing. The wound is usually closed with a dissolvable buried suture that does not need to be removed and a plastic tube to drain away any blood from the wound is sometimes used.

In the vascular department at the Kent and Canterbury Hospital, the surgeons specializing in this type of surgery will try to undertake the operation for all patients within 48 hours of admission after suffering a TIA (mini stroke) or a specially graded stroke identified by the extent or area of the brain damaged. Patients with larger areas of damage and unresolving symptoms of stroke such as arm or leg weakness might need delayed or no surgery. Each patient will be assessed on an individual basis by a vascular surgery consultant and by a specialist medical stroke doctor and treatment will be arranged as needed. When surgery is needed, this is always undertaken in the vascular unit at the Kent and Canterbury Hospital.

How will this operation help?

The intended benefit of the operation is to reduce your chance of a further stroke. We know that the narrowing in your carotid artery makes your future chances of suffering a stroke much higher than when there is no narrowing. We also know that this operation (carotid endarterectomy, to correct narrowing) will reduce your overall chance of stroke significantly, from one in five to only one in 50.

Sometimes the operation is offered to patients without symptoms, this is usually as part of a clinical trial to determine the best treatment for such patients.

Are there alternatives?

You will already be receiving medical treatment but unfortunately this does not reduce the risk of stroke as much as surgery. Recently a new treatment called angioplasty and stent is being tried, under x-ray control. A balloon is introduced through a needle in the groin into the neck artery and inflated inside the narrowing to widen the channel through the artery, leaving behind the stent to support the artery. It is too early to say if this treatment will be successful in the long term and surgery remains the best option at present.

Is the treatment safe?

Although this is a major operation, more than 99 out of 100 people will survive this type of surgery and serious complications are not common. The risk to you as an individual will depend on:

- your age and general fitness; and
- whether you have any medical problems (especially heart disease).

As with any major operation such as this, there is a risk of you having medical complications. These include:

- deep vein thrombosis (blood clots in the leg veins, less than one in 100 patients)
- heart attack (less than one in 50 patients)
- chest problems.

Each of these is rare, but overall it does mean that some patients may have a fatal complication from their operation. The doctors and nurses will try to prevent these complications and to deal with them rapidly if they happen.

The following are important surgical complications that you should have discussed with your consultant.

- A small risk of developing a stroke during the operation (one in 100) and a very small risk of death - this combined risk is less than 2%. However, you are more likely to avoid suffering a major stroke and death with surgery.

- Damage to nerves in the neck situated alongside the carotid artery being operated on. There is usually a numb area on the side of the neck and ear that may improve over several months but is sometimes permanent. Temporary hoarseness of the voice or weakness of the side of the mouth or tongue may occur. Very rarely it is permanent.

- Infection - the wound can sometimes become infected and this is usually treated with antibiotics. Rarely the patch used to repair the artery can also become infected and may need further surgery to treat this as it can be serious due to a risk of bleeding or stroke.

- Bleeding which occasionally needs a return to the operating theatre. Oozing and minor bruising around the wound is common and occasionally takes some weeks to settle down.

- Severe persistant headache with raised blood pressue can occur occasionally (one in 100), it is known as cerebral hyperperfusion syndrome and can lead on to seizures and bleeding in the brain if untreated.

Before you come into hospital

How do I decide whether to have the operation?

Everyone varies in the risks they are willing to take. The doctors will explain about what they think the risks of the operation are for you and what the risks are of not having the operation. Only you can decide whether to go ahead and have the operation. Nothing will happen to you until you understand and agree what has been planned for you. You have the right to refuse if you do not want the operation.

What should I do before I come in to hospital?

This does not apply to most patients as most are emergency admissions. Without symptoms, you will be asked to attend a pre-assessment clinic a week or so before your operation where you will be seen by one of the vascular nurse specialists to confirm your fitness for surgery and to give you further information about the procedure and your stay in hospital. Your consultant will usually arrange for you to be assessed by an anaesthetist at this clinic to discuss your anaesthetic and to check on your fitness for surgery and any problems that you may have had with previous anaesthetics.

You will have blood tests and an ECG (tracing of your heart).

It is important to prepare well for your operation. There is a lot that you can do to improve your fitness, especially if your operation is planned ahead.

- **Smoking** - if you smoke, you must try hard to give up before your operation. The longer you can give up for the better. Continued smoking will cause further damage to your arteries and your surgery is more likely to fail to prevent more strokes, and you are more likely to have complications from the operation. If you can stop smoking for a day or two, your blood cells can carry more oxygen around your body. If you can stop smoking for about six weeks before you come in to hospital, you are less likely to get a chest infection after the operation.

- **Gum;** please note any patients about to undergo an operative procedure must not chew gum / nicotine gum before their surgery.

- **Alcohol** - if you are used to drinking a lot of alcohol, it is helpful to reduce the amount that you drink.

- **Losing weight** - if you are overweight, some of the risks of the anaesthetic and the operation are increased. Losing weight will reduce these risks. You should consider a change to your diet by reducing the amount of fat that you eat. If you need any advice about this an appointment can be made to see the hospital dietician.

- **Exercise -** regular exercise will increase your strength and fitness. There is no need to push yourself; a regular walk at your own pace will boost your stamina and improve your fitness for the operation.

- **Other medical problems** - if you have a long-standing medical problem, such as diabetes, asthma, chronic bronchitis, high blood pressure, or epilepsy it is helpful to have a check up from your own GP. In particular to make sure that your blood pressure and these other conditions are as well controlled as possible.

All of these should continue after your operation.

What will happen when I arrive at hospital?

On admission, you will be greeted by a member of the ward team and introduced to your named nurse. They will discuss with you the care you will receive while you are in hospital. You will also be seen by your consultant or one of their team to explain anything you may be unsure about.

As part of your care whilst in hospital, every effort is made to ensure you are seen by the same hospital doctors who will be part of the vascular and interventional radiology team.

Final preparations for your operation will include another ultrasound check on your carotid arteries. Please do not shave any hair from your neck as this will be done in theatre for you with your consent.

You will meet the anaesthetist, who is a doctor with specialist training in anaesthesia, the treatment of pain, and in the care of patients in intensive care. They will visit you before your operation to talk to you about the anaesthetic and methods of pain relief, taking into consideration any other medical conditions that you have, and also any previous anaesthetics you have had. They will ask you about your health, look at all your test results, listen to your heart and breathing, and look at your neck, jaw, mouth, and teeth. They will be happy to answer your questions and discuss any anaesthetic worries that you have. You may be offered a local or general anaesthetic.

You will be given clear instructions about when to stop food and drink. It is important to follow this advice. If there is food or liquid in your stomach during your anaesthetic, it can get in to and seriously damage your lungs. Usually, you should have no food for six hours but non-milky drinks are allowed until two hours before your operation. You should continue to take all your regular medications even on the morning of the operation. Except, if you are taking clopidrogel in combination with aspirin, you would have been advised to stop this if and when you attended the pre-assessment clinic. You must also temporarily stop anticoagulants, for example warfarin.

A physiotherapist may see you before your operation. They will advise you of exercises to perform after the operation that will help your circulation whilst lying in bed and deep breathing exercises that will help keep your lungs clear, together with movements of your legs and feet to help prevent blood clots developing in your leg veins. It is very important that you can breathe deeply and cough effectively to help you avoid a chest infection or pneumonia.

You will be asked to have a bath or shower and put on a theatre gown on the day of your operation before you go to theatre.

You may need to have a repeat ultrasound scan of your carotid arteries before you go to theatre. This will either be arranged to happen on your admission day or the day of surgery. If needed, you will be accompanied to the ultrasound department by a member of the ward staff.

On the evening before your surgery, you will be given a tablet of clopidogrel to help prevent a stroke during and after your surgery.

The procedure will take place in the main theatre suite at Kent and Canterbury Hospital.

Will I have an anaesthetic?

The operation can be performed under a local anaesthetic (you are awake but the area is numbed) or a general anaesthetic (where you are asleep for the procedure) and the anaesthetist and surgeon will help you decide which would be better for you to have. To have the surgery under a local anaesthetic, you will need to be able to lie on your back in a semi-sitting position for at least two hours.

What happens in the anaesthetic room?

There is a period of 20 to 30 minutes preparation before the anaesthetic begins. In this period the anaesthetist's assistant will attach monitoring machines which will measure your heart rate (sticky pads on your chest), blood pressure (inflatable cuff on your arm), and oxygen levels (small peg on your finger or ear lobe).

The anaesthetist will numb your skin with local anaesthetic before using a larger needle to insert thin plastic tubes (cannulas) into a vein on the back of your hand or forearm (usually known as a drip) and also in the artery at your wrist (arterial line to measure your blood pressure). These are attached to a bag of fluid.

If you are having a local anaesthetic, the anaesthetist will clean the side of your neck with a cold antiseptic solution before injecting the local anaesthetic into your neck to numb it.

For a general anaesthetic, you will be asked to breathe oxygen through a mask whilst the anaesthetist injects drugs into your "drip". You will not be aware of anything else until after the operation is finished. Whilst you are anaesthetised, you will also have a breathing tube placed in your mouth. If having a general anaesthetic, we may also inject local anaesthetic into your neck when you are asleep to help with post-operative pain relief.

How will I feel afterwards?

You are taken to the theatres recovery area and then to the high dependency unit (HDU) for careful observation, you will then either return to the ward the next day or be discharged home from the HDU. The observations will include careful monitoring of your pulse, blood pressure, and brain function. You will still have the drip (tube) into a vein in your arm which is used to give you drugs and fluids until you are able to eat and drink normally. You may also have a drain tube in your neck wound with a bottle on the end of it to collect blood. These are both removed when no longer needed, usually the next morning.

The operation is not particularly painful, though you may need some painkillers; please ask a nurse for these if needed. You may have a sore throat and the position of your neck wound may make the moving your neck painful at first which may feel stiff for a few days following the operation. You may also experience some nausea or sickness. Once again, please tell a member of staff and they can give you treatment to help this.

Some patients can go home in the evening of the day after surgery, this is rare and most are discharged the next morning. You may need longer if still suffering effects of a stroke. You will be allowed out of bed the next day and as a safety measure you will receive injections of a blood-thinning substance (clexane) to prevent blood clots from forming. When lying in bed or sitting out it is advisable to continue the leg and deep breathing exercises shown to you by the physiotherapist.

The wound is usually closed with a dissolvable buried suture that does not need to be removed.

How long will I be in hospital?

You can expect to be in hospital for one or two days after the operation if otherwise well. The surgeon and the nursing team will advise when you are ready to go home. Please do not leave until you have been given instructions, your medication, and discharge letter for your GP.

What should I do when I go home?

A period of rest for two weeks is suggested after leaving hospital. This time is spent resting more than usual, such as having a sleep in the afternoon, and taking only gentle exercise like walking. After this period you can gradually return to normal activities. It is advisable to gradually increase the amounts of exercise that you undertake, lengthening the distances that you walk and the amount of tasks that you do.

- **Driving**: we recommend that you do not drive for at least 15 days following your operation, provided you have not had a stroke within the past month and are not still disabled, as advised by the DVLA (Driver and Vehicle Licensing Agency - www.direct.gov.uk/driverhealth). You must be able to carry out an emergency stop comfortably. Driving too soon after an operation such as this may affect your insurance. If you are in any doubt about driving, please speak to your GP or the vascular team. We also advise that you check your insurance policy details or contact your insurance company before driving.

- **Bathing**: it is important to keep your wound area clean. This can be done with a daily bath or shower, patting the area dry with a clean towel. If a wound becomes red and there is a discharge, then you should ask for advice from your GP as you may need antibiotics. If your wound is itchy, a moisturiser may help.

- **Medicines:** you will be sent home on a small dose of clopidogrel 75mg (milligrams), this is to make the blood less sticky and more circulation problems less likely. If you are unable to tolerate clopidogrel, an alternative drug will be prescribed. In some cases you will be asked to take warfarin, a blood-thinning drug instead. Also, you will be taking a statin, a drug to lower cholesterol, together with any other of your normal medications.

What do I do if feel unwell at home?

In general, call your GP or the out-of-hours doctors service. If you develop symptoms of a stroke or a severe, unremitting headache, you should return to the Kent and Canterbury Hospital immediately, call 999. Likewise if you experience any pain or swelling in your calves, any shortness of breath or pains in your chest you must seek medical attention.

Will I have to come back to hospital?

The vascular team will review you six to eight weeks after discharge in outpatients to check on your progress and on a post-operative ultrasound scan. You can contact the vascular team if you have a problem on the telephone numbers listed on the next page.

You will also receive an appointment to be reviewed by a stroke physician.

When can I return to work?

You should be able to return to jobs at home or work for an employer within one month following your operation if not still suffering the effects of a stroke. If in doubt, please ask your surgeon or GP.

Finally.....

Most or all of your questions should have been answered by this leaflet but remember that this is only a starting point for discussion about your treatment with the doctors looking after you. Make sure you are satisfied that you have received enough information about the procedure before you sign the consent form agreeing to the procedure.

Source of information

The information within this leaflet is based on current practice undertaken by your consultant and national guidelines. If you have any comments regarding this leaflet, we would appreciate your feedback

Where can I get more information?

If you have any questions or concerns, please contact one of the following: during the working day, first try the vascular nurse or, if unable to get through or out of hours ask the hospital switchboard for the vascular registrar on call.

• Vascular Nurse Practitioners	Telephone: 01227 864137 Email: ekh-tr.vascular-nurse@nhs.net
• Kent and Canterbury Hospital (K&C)	Telephone: 01227 766877 (out of hours for Registrar on call)

or your consultant's secretary

• Mr Rix, Kent and Canterbury Hospital	Telephone: 01227 864259
• Mr Senaratne, Kent and Canterbury Hospital	Telephone: 01227 783196
• Mr Shirazi, Kent and Canterbury Hospital	Telephone: 01227 864255

Useful web addresses

- National Institute for Health and Care Excellence www.nice.org.uk
- Vascular Society of Great Britain and Ireland www.vascularsociety.org.uk
- Circulation Foundation www.circulationfoundation.org.uk

This leaflet has been produced with and for patients

If you would like this information in **another language, audio, Braille, Easy Read, or large print** please ask a member of staff.

Any complaints, comments, concerns, or compliments please speak to your doctor or nurse, or contact the Patient Advice and Liaison Service (PALS) on 01227 783145 or 01227 864314, or email ekh-tr.pals@nhs.net

Further patient leaflets are available via the East Kent Hospitals web site www.ekhuft.nhs.uk/patientinformation

Information produced by the Vascular Surgery Service
Date reviewed: February 2019 Next review date: June 2021 Web 032