NHS
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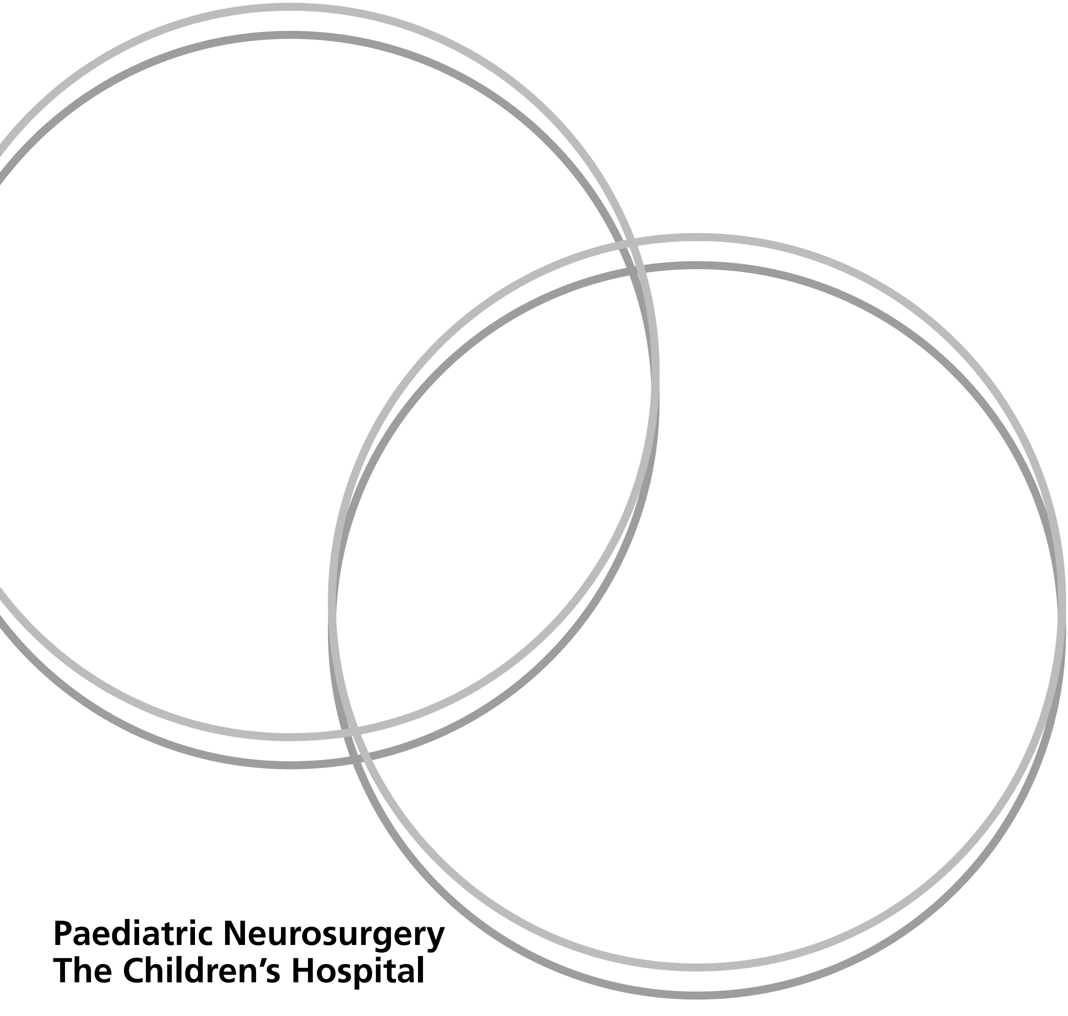
Ventriculoperitoneal (VP) and Ventriculoatrial (VA) shunt

Information for parents and carers



Paediatric Neurosurgery
The Children's Hospital

Why does my child need a VP/VA shunt?

Every child produces a fluid called cerebrospinal fluid (CSF). Within the brain there are four chambers, called ventricles, where this fluid is produced. CSF flows in the ventricles, around the brain and around the spinal cord. It protects, nourishes and discards waste products from these vital organs.

If a blockage develops in one of the ventricles, this means the CSF cannot flow freely. When this happens, there is a build-up of CSF within the ventricles, causing them to swell and create pressure within the brain. This is called hydrocephalus.

Hydrocephalus needs to be treated to prevent symptoms from becoming worse. A ventriculoperitoneal (VP) or ventriculoatrial (VA) shunt is one way of treating hydrocephalus.

What is a VP shunt?

A VP shunt is a soft, flexible tube (about 3mm in diameter) which is inserted into a lateral ventricle. It acts as a drainpipe, to give the CSF a way to flow out of the ventricles.

The tube is connected to a valve, which regulates the flow of CSF. The end of the shunt is placed within the abdominal cavity (tummy area), where the CSF will be reabsorbed.

The operation will be carried out under a general anaesthetic. This means your child will be unconscious and will not be able to feel anything. A consultant anaesthetist (doctor who will help put your child to sleep) will talk to you and your child (if appropriate) about the anaesthetic. This will be at your child's pre-operative visit, which could be on the day of their operation or a few weeks before, depending on how urgent their surgery is.

What are the risks?

All operations carry some risks. The risks from this operation include:

- infection of brain fluid (CSF)
- bleeding on the brain
- blockage of the shunt (which causes it not to work)
- wound infection and leakage of CSF
- damage to brain tissue (causing a stroke)
- swelling around the shunt.

The doctor will discuss these risks with you in more detail.

What are the benefits

A VP/VA shunt will reduce the pressure inside your child's head. This will stop your child having the symptoms associated with the high pressure that they were admitted with.

What are the alternatives?

Sometimes hydrocephalus can be treated with an endoscopic (keyhole surgery) procedure. If this is an option, your child's surgeon will discuss it with you.

Anaesthetic risks

In modern anaesthesia, serious problems are uncommon. Risk cannot be removed completely, but modern equipment, training and drugs have made general anaesthesia a much safer procedure in recent years. Throughout the whole of life, a person is at least 100 times more likely to suffer serious injury or death in a road traffic accident than as a result of anaesthesia[1].

Most children recover quickly and are soon back to normal. Some children may suffer side effects like sickness or a sore throat.

These usually only last a short time and there are medicines available to treat them if necessary.

The exact likelihood of complications depends on your child's medical condition and on the nature of the surgery and anaesthesia your child needs. The anaesthetist can talk to you about this in detail before the surgery.

Consent

We will ask you for your written consent (agreement) for the operation to go ahead. If there is anything you are unsure about, or if you have any questions, please ask the doctor before signing the consent form.

Fasting instructions

Please make sure that you follow the fasting (starving) instructions given to you by your child's nurse or doctor.

If this surgery is an emergency, the nurses on the ward will give you fasting instructions.

Fasting is very important before an operation. If your child has anything in their stomach whilst they are under anaesthetic, it might come back up while they are unconscious and get into their lungs.

Pregnancy statement

All girls aged 12 years and over will need to have a pregnancy test before their operation or procedure. This is in line with our hospital policy.

We need to make sure it is safe to proceed with the operation or procedure, because many treatments including anaesthetic, radiology (X-rays), surgery and some medicines carry a risk to an unborn child.

The pregnancy test is a simple urine test and the results will be available immediately. If the result is positive, we will discuss this and work out a plan to support your child.

What happens before the operation?

Your child may already be an inpatient on the ward before their surgery, after being admitted as an emergency. If they are not, you will be asked to bring them in to hospital at 7.30am. They need to come to Children's Theatre Direct Admissions (TDA). This is based on Robin's Ward at the Children's Hospital in Oxford.

When you arrive, you and your child will be greeted by a nurse or healthcare assistant and will be shown to the waiting area. The nurse will check your child's paperwork and put some name-bands around their wrists or ankles. They will also measure your child's temperature, heart rate and breathing rate.

Your child will then be seen before their surgery by the neurosurgical team. The doctors will also take your child's medical history and samples of blood. This is to make sure the right type of blood is available during the surgery, if it is needed. The blood test will also be sent to check their electrolyte level (biochemistry) and for any signs of infection.

The nurse or health care assistant will look after you and your child until your child is in theatre. There are also play specialists available to help your child prepare for the operation and to keep your child them distracted with play activities both before and after the operation. They will also help with preparing them for their anaesthetic. There are toys and gaming devices available for all ages.

The nurse and healthcare assistant will make sure you understand the routine of the day and your child's care before the operation. They can answer any questions you both may have.

If your child is unwell and this procedure needs to be carried out as an emergency, your child will already be an inpatient (so will not need to be taken to TDA). They will still need to have blood samples taken before the surgery.

In the anaesthetic room

A nurse or play specialist and one parent or carer can come with your child to the anaesthetic room. Your child can also take a toy or comforter.

It may be possible to give the anaesthetic with your child sitting on your lap. Your child may either have anaesthetic gas to breathe, or an injection through a cannula (a thin plastic tube that is placed under the skin, usually on the back of the hand). Local anaesthetic cream (EMLA or Ametop, sometimes known as ‘magic cream’), can be put on their hand or arm before injections so they do not hurt as much. It works well for 9 out of 10 children.

If the anaesthetic is given by gas, it will take a little while for your child to be anaesthetised. They may become restless as the gases take effect. If an injection is used, your child will normally become unconscious very quickly indeed. Some parents may find this upsetting.

Once your child is asleep you will be asked to leave quickly so that the medical staff can concentrate on looking after them. The nurse will take you back to the ward to wait for your child.

Your child will then be taken into the operating theatre to have the operation. The anaesthetist will be with them at all times.

What happens during the operation?

Before the operation starts, some of your child's hair may have to be shaved. The surgeons will try to shave the smallest area possible and it will grow back in time, after the operation.

The surgeon will then make an incision (cut) approximately 3-5cm above and behind your child's ear and also on their abdomen. A hole will then be made in their skull (approximately the size of a 50p piece). Occasionally the hole will be made at the front of the head, behind the hair line.

The top end of the shunt will be inserted into the lateral (biggest) ventricle in the brain. The remainder of the shunt tubing will then be tunnelled down under the skin until it reaches the abdomen, where a coil of tubing will remain (VP shunt). This allows the shunt to expand as your child gets taller, so it doesn't need replacing as they grow.

Another area which can be used to drain the CSF into, is the right atrium of the heart (the chamber which receives used blood from the body), as this is the easiest to access surgically (VA shunt). We will discuss this with you before the operation if we think this procedure will be necessary.

The operation starts off the same way, although a small incision (cut) will be made on the right side of the neck rather than the abdomen.

The end of the shunt will be tunnelled into the bloodstream through a large vein, which ends in the right atrium. This is where the CSF will be absorbed within the blood.

A general surgeon or an intervention radiologist (an expert that uses images to guide medical instruments), as well as a neurosurgeon, will be involved in the insertion of a ventriculoatrial shunt.

When the operation is finished, the scalp and abdomen/neck will be stitched back together using dissolvable stitches. You are likely to be able to feel and see the shunt below the skin.

The operation will take 1-2 hours, but your child will be away from the ward for up to 3 hours. This is to allow the anaesthetic to take effect before the operation and then give them time to come round afterwards.

After the operation

After the operation your child will be taken to the recovery room whilst they come round from the anaesthetic. You will then be collected to go with the nurse to the recovery room where you will be able to see them.

A recovery nurse will look after your child until they are ready to come back to the ward. The nurse will make regular checks of your child's pulse, blood pressure, temperature and wound. They will also make sure your child has adequate pain relief. The nurse will then bring you and your child back to the ward.

The nurse will need to look in your child's eyes with a small torch, to check that they are reacting as they should. They will also ask them a couple of questions (if they are old enough/able to answer) to check their level of consciousness.

Some children remain sleepy for a little while after their operation, while other children wake up quickly. If your child is still sleeping, it is important for the nurse to wake them up, to check that they can be easily woken.

The nurse will also need to assess how much movement and sensation your child has in their limbs. Once your child begins to recover, the frequency of these checks can be reduced. We will also regularly inspect your child's wound, to check for leaking or bleeding.

Recovery from the anaesthetic

When your child is awake from the anaesthetic they can start drinking and, if they are not sick, they can begin to eat a light diet. Often, children are given fluids through their cannula until they are able to tolerate their normal diet again.

Occasionally, the anaesthetic may leave your child feeling sick for the first 24 hours and they may vomit. The best treatment for this is rest and small, frequent amounts of fluid, toast or biscuits. We can also give medication to help with this, but it should settle with time.

Pain assessment and pain relief

Your child's named nurse will use a pain assessment tool to help assess your child's pain score after their operation. This is a chart which helps us to gauge how much pain your child may be feeling.

You and your child will be introduced to this assessment tool either at their pre-assessment visit or on the ward before their operation. You can continue to use this assessment at home to help manage your child's pain if you wish.

Your child will be given paracetamol when they need it after the operation, to help keep them comfortable.

Discharge advice – leaving hospital

The anaesthetic and operation itself may cause headaches, but these will get better as your child recovers. These can be caused by changes in pressure in the head from high to low. We can give your child pain relief to help with these.

It is likely your child will be ready to go home between 3-5 days after the operation.

Wound care and hygiene

Before your child is discharged from hospital the doctor will confirm whether they can have a shower or quick bath. The nurse can show you how to wash your child’s hair, to reassure you that you won’t hurt them. A mild/baby shampoo can be used, but avoid soaking or rubbing the wound, as this causes the stitches to dissolve too quickly, which may result in the wound opening or not healing well.

Fresh, clean water should be used to wash and rinse their hair, as this reduces the risk of infection. It is also important to avoid using conditioner, moisturisers or body lotion around the wound area, as they can also cause the stitches to dissolve too quickly and be a risk for infection.

They will not be able to have a long bath or shower (over 5 minutes) for 6 weeks after the operation, as this will cause the stitches to dissolve too quickly, which may result in the wound opening or not healing well.

The stitches used to close the wound will gradually dissolve this usually takes 7-14 days but can take up to 6 weeks.

Your child should be discouraged from scratching the wounds, as this could cause an infection. If the wound/s becomes red, inflamed or painful call the ward on the number given at the end of this leaflet.

Occasionally non dissolving stitches will need to be used. If this is the case your surgeon will discuss this with you before the surgery.

There is likely to be a small hollow on your child's head, where the operation was carried out, and the skin around the scar may feel numb. This is normal and will improve with time.

The dressing on your child's abdomen will be removed before they are discharged. There will be no need for further dressings.

Please make sure you have enough children's paracetamol at home, ready for when your child comes home from hospital. You can give them children's paracetamol, but not more than once every 4-6 hours, with no more than 4 doses in a 24 hour period.

You can also give them children's ibuprofen every 6-8 hours, but only give a maximum of 4 doses in a 24 hour period

Please make sure you follow the correct dosage instructions for your child's age.

Follow-up care

Your child may have occasional headaches or stomach pain from the wounds. You can give them children's paracetamol, but not more than once every 4-6 hours.

You can also give them children's ibuprofen every 6-8 hours, but only give a maximum of 4 doses in a 24 hour period. Please make sure you follow the correct dosage instructions for your child's age.

Your doctor will tell when your child needs a follow-up appointment. The letter confirming this will come by post within 2 weeks. Please contact the hospital switchboard and ask to speak to your child's consultant's secretary if this does not arrive after this time.

Your child will have a follow-up appointment with their neurosurgical consultant around 6-8 weeks after they have left hospital, to check on their recovery.

Getting back to normal

When your child returns to school depends on how they feel when they return home. Most children who have this operation return to school 1 week after they are discharged from hospital after this operation.

Your child may feel tired for several weeks after the operation, but this is normal. Gradually increase the amount your child does until they are back to their usual level of activity.

Your child may be able to return to sporting activities such as PE, bike riding, swimming, etc. after 6 weeks, depending on their recovery.

Your child can go away on holiday (including flying) when they feel well enough and have had their follow-up appointment. Please make sure your insurance company is aware that your child has a shunt fitted.

Signs to look out for

Occasionally the VP/VA shunt may develop problems, such as a blockage or infection. If either of these things happen, your child will need an operation to fix the problem.

If your child displays similar symptoms to those they had before their shunt was put in, it could mean there is a problem. It is essential that you either call the ward or go to your nearest Emergency department immediately if you have any concerns.

Signs that there may be a problem with the shunt include:

- drowsiness
- limb weakness
- confusion
- problems or changes to their eyesight
- increased headaches
- irritability
- not wishing to feed or vomiting
- Bulging fontanelle (soft part of the skull) in a baby, or an increasing head circumference
- fever/high temperature
- any other sign that gives you concern.

How to help with your child's recovery

A healthy balanced diet is important for your child's recovery, as it gives them energy to recover and helps with wound healing.

Regular pain relief is important, as it helps reduce any discomfort. This will help your child to keep moving, which can speed up their recovery.

How to contact us

If you have any further questions, worries or queries about your child once you get home, please contact us. We are available 24 hours a day, 7 days a week.

Robin's Ward

Tel: **01865 231 254/5**

Melanie's Ward

Tel: **01865 234 054/5**

Neurosurgical Nurse Specialist

Tel: **01865 226 535**

To contact your child's consultant's secretary, please phone the John Radcliffe Hospital Switchboard.

Tel: **0300 304 7777**

If your child requires urgent treatment, please call 999 or go to your nearest Emergency Department.

How can I give feedback about my experience?

We would like to hear about your experience with our Childrens Services. There are different ways to feedback to us:

Online: **www.ouh.nhs.uk/childrens-feedback**

Email: **childrens.patientexperience@ouh.nhs.uk**

Or ask for a paper survey to fill in.

Further information

You may find the information from the following websites helpful:

www.brainandspine.org.uk/hydrocephalus-water-brain-and-shunts

www.shinecharity.org.uk

References

[1] From the Royal College of Anaesthetists (2014) Fourth Edition Your child's general anaesthetic. Information for parents and guardians of children.

Website: www.rcoa.ac.uk/patientinfo

We hope that this information is useful to you and would welcome any comments about the care or information you have received.

Please bring this leaflet with you on the day of your child's operation.

If you need an interpreter or would like this information leaflet in another format, such as Easy Read, large print, Braille, audio, electronically or another language, please speak to the department where you are being seen. You will find their contact details on your appointment letter.

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www.ouh.nhs.uk/information

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