



**University Hospitals
Bristol and Weston**

NHS Foundation Trust

Patient information service
Bristol Royal Hospital for Children

Information about cardiac catheterisation



The information provided in this leaflet intends to give you a general overview of what to expect when having a cardiac catheter procedure. More specific information regarding your child's procedure will be discussed with you by your cardiology team.

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What is cardiac catheterisation?

Cardiac catheterisation is a test to obtain information about your child's heart. It is carried out by a cardiologist specialising in this field called an interventional cardiologist.

Cardiac catheterisation can be performed to assess your child's heart condition, to see how well the heart is pumping by measuring pressures within the various chambers of the heart, and also to determine the condition of the valves. This is called a diagnostic catheter. Sometimes, diagnostic catheterisation is also used to assess the lung artery pressures and their response to special levels of oxygen and gases.

Cardiac catheterisation can also be used to treat a wide range of cardiac conditions, such as opening a narrow valve or blood vessel or closing an abnormal communication. This is called an interventional catheter.

The procedure that your child is going to have will be fully explained to you by your cardiologist in an outpatient clinic, as well as the interventional cardiologist near the time of the procedure. This consultation is extremely important, as we try to make sure that you are as prepared for the forthcoming operation as you can be.

You may want to bring a notebook with you along with any questions you have. You may also want to bring someone to this appointment to support you. If you wish to record the conversation to help you remember the details, please ask the consultant about this. It often happens that further questions come to mind after the consultation. If this happens, you can phone one of the cardiac nurse specialists to ask them.

What will happen before admission?

Coming to the pre admission clinic

This pre-admission clinic appointment is to check that your child is well enough for their procedure. It is also your opportunity to tell us about any particular needs your child may have, ask any further questions, or talk about any worries. The clinic is currently held every Thursday in the outpatients department at the children's hospital. This is often quite a long appointment, taking up to four hours; it will include a number of investigations such as an echocardiogram, chest X ray, electrocardiograph, blood tests, nose and groin swabs.

Our clinical nurse specialists and our play specialists will also talk to you about how they can support you and your child, for example by offering distraction during tests or investigations that take place during the clinic. A research nurse will also see you if your child is eligible to take part in any of the research studies running at the hospital.

What happens if my child's cardiac catheter procedure is cancelled?

We take cancelling a patient's procedure very seriously and try to avoid this whenever possible. Unfortunately, it may be necessary to cancel the catheter from time to time, and this usually happens for one or more of the following reasons:

- an emergency patient has been admitted and needs to take priority
- previous operations may have taken longer than expected
- there may not have been enough staff to do the operation safely, either in the paediatric intensive care unit (PICU) or in theatre

- there may not have been a PICU or high dependency unit (HDU) bed available due to emergencies
- your child may be unwell with an acute illness.

If your child's procedure is cancelled at short notice, a member of the cardiac clinical team will talk to you and advise you of the plan for rescheduling the procedure according to your child's needs.

Please be assured that we have systems in place to ensure that patients on the waiting list are monitored and brought in for catheters according to their needs. If, whilst you are awaiting a new date for your catheter, you should have any concerns about your child's health, please contact a member of the clinical nurse specialist team to discuss these.

When a new date is available for your child, we will either call you to confirm or, if planned sufficiently ahead of schedule, we will write to you to advise you of the new date and time for admission.

The day of admission

Your child will be admitted to the ward on the morning of their catheter.

When your child is admitted to the ward, your child's nurse will talk to you about what to expect. You will meet the anaesthetist and talk through any questions that you have.

Pre-procedure fasting

Your child will need to be nil by mouth before the cardiac catheter procedure. You will be advised by the bookings team or Cardiac Nurse Specialist team regarding specific fasting times. If you are unsure, please contact the Cardiac Nurse Specialist team on 0117 342 8286.

Hygiene

A bath or shower is required either the evening before or on the morning of the procedure. Older children may be asked to use depilatory cream or razor to ensure their groin area is easy to clean (sterilise) in theatre, as this is where the catheter will be inserted. The ward staff will provide you with a theatre gown for your child. Some children may prefer to keep their own pyjamas on, and this will be accommodated if possible. However, it will be necessary to remove the pyjamas later in the catheter laboratory to do the catheterisation.

Day of procedure

The anaesthetist (the doctor who will give your child the anaesthetic so that they remain asleep throughout the procedure) will see you and your child ahead of the procedure. They will explain how they intend to send your child to sleep.

Your child will go to the cardiac catheterisation suite on the fourth (yellow) floor in the children's hospital.

It is possible for at least one parent to accompany your child down to the anaesthetic room.

The anaesthetist will use either a mask or an intravenous cannula (needle) inserted into your child's hand to give them the medicine to put them to sleep. Some children (but not small

babies) may be given a pre-medication (medication to make them relaxed and sleepy) before going to the catheter laboratory.

Once your child is asleep, you will then be asked to leave the catheter laboratory so that the procedure can take place.

What happens during the catheter?

A fine tube (catheter) is inserted through the skin into a vein or artery in the groin or the neck. The tube is guided along the vein or artery into the heart. Pressures within the heart can be measured and blood samples taken to check the oxygen content in the various chambers of the heart. The doctors follow the progress of the catheter under X ray guidance. A contrast fluid (the dye) is commonly also injected into the heart through the catheter, and extra pictures may be taken. This is to demonstrate the anatomy of the heart and blood vessels.

If your child is having an interventional catheter (treatment), specialised catheters, devices and equipment will be used as necessary for the particular procedure. The cardiologist performing the procedure will explain to you in detail the procedure to be performed. This will include the need for the procedure, the benefits of the procedure, the potential risks and, if relevant, other treatment options that are available.

What can go wrong?

Routine diagnostic cardiac catheters and most routine interventional catheters are performed safely without any problems, but they do carry a risk of complications, most of them minor, but some of them major. Some complex interventional catheters carry a higher risk of complications, especially in smaller children. These complications will be explained to you prior to the procedure by the doctor. Some of the most common or more serious complications are explained below.

Loss of foot pulses / cold foot

The artery that is used to access the heart, called the femoral artery, could go into spasm or be blocked by a clot, causing reduced or absent pulses in the leg. The majority of cases resolve without any treatment. Occasionally your child may need a blood-thinning medication called heparin through a drip to restore the pulse. Very rarely, stronger 'clot blasting' medication may need to be used if the problem persists despite heparin.

Localised bleeding

More commonly, there may be minor bleeding or bruising at the groin site where the catheters were introduced. This problem is reduced by firm pressure on the groin when the catheters are removed and bed rest for four hours after the catheter has been performed.

Arrhythmia

Disturbance of heart rhythm may occur during manipulation of the catheters. The heart can either beat too quickly or too slowly. It usually resolves with simple measures such as withdrawing the catheter or deflating the balloon, although sometimes a medicine has to be given to slow the heart rate. Very rarely, the electrical conduction of the heart may be interrupted between the top and bottom chambers and your child may require a temporary pacemaker.

Damage to heart muscle and valves or blood vessels

Manipulating the catheters along blood vessels or within the heart can very rarely cause tears or perforations requiring surgical repair.

Reaction to the contrast medium (the dye)

There is an extremely small risk of a minor allergic reaction, in the form of a mild rash, to the dye used during angiography. Serious allergic reactions are rare.

Stroke

Blood clots may form during cardiac catheterisation and may cause a stroke if they travel to the brain via the bloodstream. A blood-thinning medicine called heparin is given during the procedure to reduce that risk.

Death

There is a one to two in 1,000 risk of not surviving the procedure due to a major complication which cannot be dealt with by catheter or open heart surgery. Your cardiologist will discuss the risks with you and your child and obtain written informed consent prior to the procedure. The above list is not exhaustive and other rare complications may occur. Please ask your interventional cardiologist if you require any further information.

What happens after catheterisation?

As soon as the procedure is finished, your child will be taken to the recovery unit until they recover from the anaesthetic. When their condition is stable, the staff in the recovery areas will telephone the ward and update you about when you are able to go down and see your child. Only one parent can go to recovery at any one time as there is limited space. Your child will then return to Dolphin ward.

On the ward, your child will be closely monitored with regular observations. Your child's groin area will be checked to ensure that there is no fresh bleeding, and the pulses on their feet will be checked regularly.

Your child will be encouraged to lie in bed with their legs straight for up to four hours after the procedure. This is to help the wound to heal and prevent bleeding. Babies may be more settled on their parent's lap. Videos, books or games are useful here! Your child will need to use a bedpan or urinal while they are on bed rest.

Later on, your child may feel like sitting up and walking to the toilet; they will need someone to be with them in case they feel dizzy. Occasionally, the catheter insertion site will begin to bleed again. If this occurs, apply pressure. Sometimes a dressing will need to be applied for several minutes.

Your child will be able to drink clear fluids soon after they return to the ward. Do not be too alarmed if they vomit a small amount; this frequently occurs after an anaesthetic and tends to settle over a few hours.

If your child continues to feel sick, the nurse will give them some anti-sickness medication. When they are feeling more awake they may enjoy something light to eat, and will be encouraged to drink plenty of fluid.

Who will do the procedure?

While every effort will be made to ensure that the cardiologist you meet will be the cardiologist performing the catheterisation, this is not always possible. However, the cardiologist carrying out your child's catheterisation will always be highly experienced. If you have concerns about this please raise it with the nurse looking after you so that you can speak to someone in advance.

Trainee doctors

Bristol Royal Hospital for Children is a training hospital for nurses and doctors. There are almost always trainee doctors present during the cardiac catheter procedure who will assist with the procedure and may perform part of the procedure depending on their level of experience. They will always be supervised by the interventional cardiology consultant responsible for the procedure.

How long does the test take?

The time taken to complete the procedure can vary from a minimum of one hour up to several hours, depending on the complexity of the case. The interventional cardiologist who explains the procedure to you will be able to give you a clearer estimate of length of the procedure. If there is an unexpected delay during the procedure, the interventional team will inform you of the reason and the progress of the catheter at the first opportunity, though it will not be possible to give you minute by minute updates.

As soon as the cardiologist has all the information that is required, the catheter tube will be removed and the groin or neck area will be pressed on by hand until all of the bleeding stops.

Will all the results be known immediately?

The cardiologist who has performed the procedure will usually see you at the end of the day and discuss the outcome of the catheter with you. Sometimes the full results may not be available immediately. When an intervention is performed, the intervention will be explained to you.

When a diagnostic catheter is performed, the findings usually need to be discussed in the joint cardiac conference meeting (JCC). The JCC is a weekly meeting where all the members of the cardiac team meet and discuss further management for the patients. A follow-up appointment will be made for you to come and discuss the findings and next steps.

When will your child be allowed home?

Provided your child is well, they will usually be discharged home the day after an intervention.

Many children will require further investigations before discharge, and some children on long term anti-coagulation treatment can need to stay slightly longer. These investigations can include a chest X ray, an echocardiogram or an ECG. The doctors and nurses caring for your child will explain exactly what tests are to be done and why.

When your child is discharged, arrangements will be made for follow-up, which will depend on the kind of procedure performed.

Caring for your child at home

Children usually recover from their catheter within 24 to 48 hours. Occasionally some children will take a bit longer to recover fully. It may be advisable to keep children off school for a couple of days after a catheter and to encourage them to drink plenty of fluids.

If your child develops a temperature, or becomes unwell over the two to three days after the procedure, then please contact the Cardiac Nurse Specialist team 8am to 4pm, or Dolphin ward out of hours using the number shown on page 15 of this booklet.

You may be advised to bring your child back to the hospital to be checked or to go to your GP or local hospital.

Some children may complain of pain in the groin area and may benefit from some paracetamol (liquid or tablet). Bruising in the area is normal, but if your child has difficulty in using their leg, has excessive bruising, or if a lump appears at the site of the bruise, then please contact Cardiac Nurse Specialist team 8am to 4pm, or Dolphin ward out of hours for advice.

Wound care

The small injection wound sites should be kept clean and dry for at least 48 hours to allow them to heal; therefore, do not bathe your child during this time. Children should be told not to rub the groin area used for performing the catheter for a few days due to the risk of bleeding.

When changing babies and toddlers, clean the area at each nappy change using clean cotton wool dipped in clean clear water. Baby wipes may be a little irritating to the area for a few days. While the wound is healing, many children will complain of it feeling itchy – this is normal. The wound should look pink around the edges as it is healing.

You are advised to contact the Cardiac Nurse Specialist team 8am to 4pm, or Dolphin ward out of hours, if you notice any of the following:

- the catheter site (wound) is red or swollen
- there is oozing or weeping from the site
- there is a hard lump in the area
- there is excessive pain
- there is difficulty moving the limb.

Play and exercise

Your child may be advised to avoid strenuous exercise such as cycling and running until they have been given the OK by the cardiologist. Please speak to the cardiologist performing the procedure or your responsible consultant for further advice.

Immunisations

Your child will be able to have immunisations after a cardiac catheter, but we generally advise avoiding immunising your child in the few days before and after the catheter procedure. We advise that you discuss this with your cardiologists if in doubt.

Information about endocarditis

Bacterial endocarditis is a serious infection that affects the lining of the heart, which is known as the endocardium. The infection is caused by bacteria getting into the blood stream and settling on the heart. It is extremely rare in normal hearts, but children with certain congenital heart defects are at a higher risk of this infection.

Because of the increased risk, we advise that:

- your child maintains good dental hygiene and has regular dental check-ups
- your dentist is aware of your child's heart condition
- your child ideally avoids ear / body piercing and tattoos. If your child has already had a piercing or tattoo, they should be extra vigilant for signs of infection
- skin infections should be promptly treated with antibiotics.

Recent guidelines published by the National Institute for Health and Care Excellence (NICE) no longer recommend routine antibiotics prior to dental or minor surgical procedures as there is little evidence to support this practice. Further information can be obtained at www.nice.org.uk/Guidance/CG64.

General information

Bed status

Please ring **Dolphin ward on 0117 342 8332 or 0117 342 8679 the morning of your admission** to check that there is still a bed available for your child's admission.

Medications

Please bring in all your child's medicines or a copy of the latest prescription. This will help the ward staff in prescribing and administering them. They will be kept safely in the ward medicine cupboard for the duration of your child's stay.

Luggage

Please keep this to a minimum as space is limited on the ward. Please bring your own nappies. We have a small clutter box to store a few of your child's favourite toys. There are also prams on the ward which can be borrowed if required. We also supply breast pumps and microwave steriliser bags on the ward.

Food

Food is provided for your child. We suggest bringing your own baby jars or milk if your child is used to a particular make. You can bring in food supplies for yourselves – this can be stored, clearly labelled, in the fridge-freezer in the parents' room. There is also a microwave, cold water dispenser, and tea and coffee making facilities.

Accommodation

There is pull-down bed by your child's bed space for one parent to stay.

Car parking

You can obtain a hospital parking permit, which is valid for for the duration of your admission. You first need to purchase one ticket from a hospital pay and display machine. Both the ticket and permit should be visibly displayed on the dashboard. Hospital car parking is limited and we encourage the use of public transport where possible.

Visitors

There is a 'quiet time' between 1pm and 2pm. Visitors are welcomed outside of this time – no more than two at a time. Additional visitors are welcome to use the parents' room and take turns to visit the child. Siblings are welcome, but regrettably, we cannot accommodate other children.

Cancellation

Cancellations are avoided where possible but occur due to emergencies or equipment failure.

Discharge checklist

Below is a list of some of the issues you need to think about before leaving:

- Are my contact details correct? (so we can let you know about future appointments)
- Where and when will the outpatient follow-up take place?
- Do I understand my child's medicines and how to give them?
- How will I care for the wound?
- Do I understand what my child can and cannot do?
- What symptoms should worry me?
- Do I need any special equipment or feed to take home?

Who is there to support us when we leave?

We know that you and your child are likely to be apprehensive about coming into hospital. There is a wide team available to support your family and help you prepare for the procedure.

The cardiac nurse specialists are based on Dolphin Ward, and their role is to support children and their families by providing education and support before, during and after admission.

They liaise directly with community staff (health visitors and GPs), ensuring they have the correct information about the child's condition and treatment so that families can be supported when discharged from hospital.

They also liaise with schools and nurseries about children's needs. This helps with trying to give children as normal a life as possible despite restrictions that may result from their cardiac condition.

If you have not met the cardiac nurse specialists already, and feel that you would like to, just let one of the ward nurses know or contact the team directly using the information below. is also a microwave, cold water dispenser, and tea and coffee making facilities.

See useful contacts on the following pages.

Useful contacts	Contact numbers
Bristol Cardiac Nurse Specialist	Telephone: 0117 342 8286 (answerphone out of hours)
Cardiff Cardiac Nurse Specialist	Telephone: 02920 745 184
Ward team	
Dolphin Ward (E600)	0117 342 8332 0117 342 8679
Cardiac psychology team	0117 342 8168
Other support services	
Bristol Royal Hospital for Children main reception	0117 342 8460
LIAISE family support team	0776 101 8065
Play team	0117 342 8194
Disability support	0117 342 8653
Outpatients	0117 342 8440 / 8441

Notes

As well as providing clinical care, our Trust has an important role in research. This allows us to discover new and improved ways of treating patients.

While under our care, you may be invited to take part in research. To find out more please visit: www.uhbw.nhs.uk

Help us prevent the spread of infection in hospital. Please make sure your hands are clean. Wash and dry them thoroughly/use the gel provided. If you have been unwell in the last 48 hours please consider whether your visit is essential.

Smoking is the primary cause of preventable illness and premature death. For support in stopping smoking contact NHS Smokefree on **0300 123 1044**.

Drinkline is the national alcohol helpline. If you're worried about your own or someone else's drinking, you can call this free helpline in complete confidence. Drinkline on **0300 123 1110**.

For access all patient leaflets and information please go to the following address:
<http://foi.avon.nhs.uk/>

Bristol switchboard: **0117 923 0000**
Weston switchboard: **01934 636 363**
www.uhbw.nhs.uk



For an interpreter or signer please contact the telephone number on your appointment letter.



For this leaflet in large print or PDF format, please email patientleaflets@uhbw.nhs.uk.

