Great Ormond Street Hospital for Children NHS Foundation Trust: Information for Families

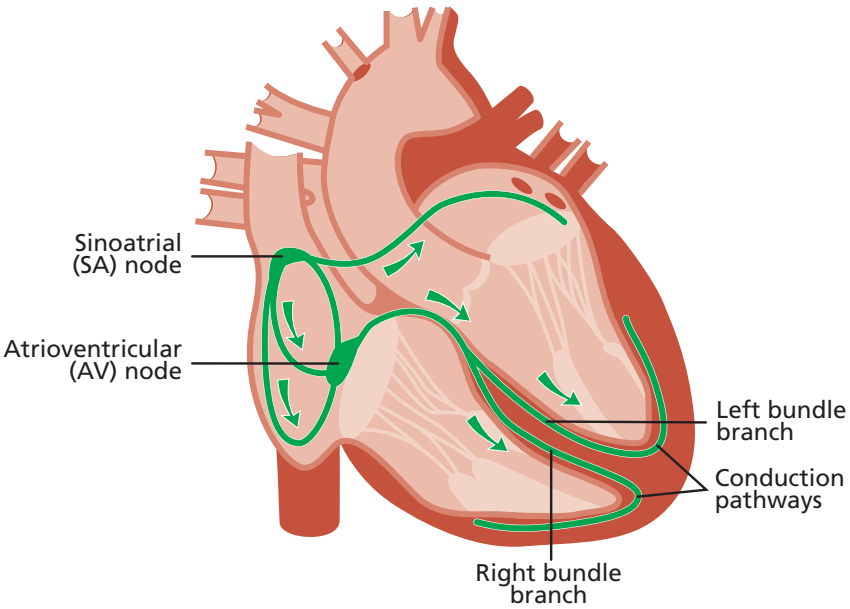
Adrenaline provocation test

This information sheet explains about adrenaline provocation tests, what is involved and what to expect when your child comes to Great Ormond Street Hospital (GOSH) for the test.

What is an adrenaline provocation test?

An adrenaline provocation test is carried out to diagnose two conditions. One called Long QT syndrome the other CPVT (Catecholeminergic Polymorphic Ventricular Tachycardia).

Long QT syndrome is a where the heart takes longer to 'recharge' between beats – this recharging is called 'repolarisation'. The condition is important as some people with the condition are at risk of a dangerous heart rhythm. On an ECG trace, there is a longer gap (usually measured in milliseconds) between the parts of the heartbeat wave labelled Q and T by doctors. However, this pattern may not be present all the time. An adrenaline test uses a medicine called adrenaline to provoke these typical ECG changes.



CPVT is a condition where under exercise or excitement the heart can go into a dangerous fast rhythm (ventricular fibrillation). An ECG trace and echocardiogram may appear normal at rest. A diagnosis can be made using exercise testing or long term ECG monitoring. Sometimes when there is a possibility of having CPVT and the other tests do not show a firm diagnosis, it is important to undertake and adrenaline challenge.

The heart has an electrical system that makes it pump. A normal electrical impulse starts in a specialised area of heart tissue in the right atrium called the SA Node. It then passes from the right atrium through to the ventricles via the AV node. As the impulse passes through the atrium it makes it pump blood into the ventricle. It has the same effect when it passes through the ventricle. This electrical impulse is something that happens naturally. You can't feel it and the electrical impulses travel through the heart each time it beats. It can go wrong though, which is what causes abnormal heart rhythm.

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Are there any alternatives?

An electrocardiogram (ECG) over a short period of time or over 24 hours can be useful in detecting abnormal electrical activity in the heart but only if it occurs while the test is taking place. A cardiac exercise test may bring on the abnormal activity but sometimes, doctors need to provoke the typical ECG pattern using an adrenaline test so that they can diagnose Long QT syndrome or CPVT.

When you receive your appointment letter

If you are unable to keep this appointment, please inform the department as soon as possible. Sometimes, we can offer the appointment to another child on the waiting list.

Before the test

There may be some medications that you need to stop taking before the test, for example, beta blocker medication. Please discuss any medications you are taking with the doctor or clinical nurse specialist beforehand.

The day of the test

Your child does not need to prepare for the test. As sticky sensor pads will be applied to your child's chest area, it would be helpful if they could wear loose clothes they can take off easily. Please arrive on Walrus ward at the time stated in your child's appointment letter.

The test

For the tests carried on the ward or exercise test room, you will be able to stay with your child throughout the test. For the tests carried out under anaesthesia, you will be able to stay with your child until they are asleep and be called once they are being woken up.

They will need to take off their clothes so the chest is exposed and some of the arms and legs. They will lie on a bed next to the ECG machine. The technician will apply some sticky sensor pads on your child's chest, which they will then connect with wires to the ECG machine. Your child's heart activity will be recorded through the sensors and you will both be able to see the picture of the heart tracings on the screen.

The doctor, nurse or technician will insert a cannula (thin plastic tube) into a vein so that the injection of adrenaline can be given more easily. They will put some local anaesthetic cream on before the test so that the cannula does not hurt so much when it is inserted.

When the cannula is in place, the doctor will inject a small amount of adrenaline medicine over a period of a few minutes. Once they have given the injection, your child will be monitored closely for around 30 minutes. As they are giving the injection, children have told us that they feel a warm flush and tingling skin. These feelings only last a minute or two.

Some of our patients experience the sensation of their heart racing. This is often like the feeling like running up the stairs or feeling nervous. We expect this to be short lived and will settle when the test stops. This feeling is unusual in the context of resting or lying down and we prepare our patients to expect it and not to feel worried about it.

If there are symptoms that the patients do not tolerate such as a heading, feeling dizzy or increasing anxiety we can stop the test. The symptoms will settle within a minute or two. If your child feels unwell or if abnormal rhythms are seen on the ECG, the test will stop.

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After the test

The technician will remove the sensor pads and if no further tests are planned, you will be free to go home. The doctor will discuss the results of the test with you before you go home. The technician will also write a report of the test.

Are there any risks?

A very small number of children who turn out to have Long QT syndrome or CPVT may have serious heart rhythm problems during the test. Occasionally, these heart rhythm problems will need further treatment to 'shock' them back into a normal rhythm. As soon as the doctor sees any abnormal heart rhythms on the ECG, they will stop the test to reduce the risk of this happening. Some people are allergic to adrenaline but every precaution will be taken to prevent or stop an allergic reaction.

If you have any questions, please ask your child's doctor or nurse

Compiled by the Cardiorespiratory team in collaboration with the Child and Family Information Group
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