This information sheet from Great Ormond Street Hospital (GOSH) explains about the different forms of supraventricular tachycardia – AV node re-entry tachycardia, atrial flutter, AV reciprocating tachycardia, atrial tachycardia and junctional tachycardia – their causes, symptoms and treatment and where to get help.

Other forms of supraventricular tachycardia, such as Wolff-Parkinson-White syndrome, inappropriate sinus tachycardia and neonatal supraventricular tachycardia are covered in separate information sheets.

The normal heart
The heart is a special kind of muscle which acts as a pump to keep blood moving around the body. The pumping action of the heart muscle is triggered by electrical impulses which pass through the walls of the heart, causing them to contract.

A specialised area of heart tissue called the sinoatrial (SA) node is the starting point for each electrical signal through the heart. The electrical impulse travels through the walls of the top chambers of the heart (the left and right atria), causing them to contract and squeeze blood downwards into the bottom chambers of the heart (the left and right ventricles). The impulse stops briefly at the atroventricular node (AV node), before passing into the walls of the ventricles. As it moves through the ventricles, it causes them to contract and pump blood out of the heart. The right ventricle pumps blood to the lungs, while the left ventricle pumps blood to the rest of the body. This electrical impulse travels through the heart each time it beats. It is something that happens naturally – it cannot be felt.

What is supraventricular tachycardia?
Supraventricular tachycardia is the name given to the condition where the heart beats extremely fast but in a regular fashion for a period of minutes to hours. Supraventricular means that the fast heart beat starts above the ventricles.
There are several types of supraventricular tachycardia:

- **AV node re-entry tachycardia (AVNRT)** – this is a short circuit near the AV node. The special cells near the AV node allow the impulse to travel at different speeds. A circuit is created as the impulse leaves via the fast cells and comes back via the slow cells.

- **Atrial flutter** – the impulse travels around the atria in a circular pattern causing the heart to beat faster than usual.

- **AV reciprocating tachycardia (AVRT)** – the impulse starts normally but travels back to the atria through an additional pathway between the atrium and ventricle. This type of tachycardia is most commonly associated with Wolff-Parkinson-White syndrome.

- **Atrial tachycardia** – the impulse starts in a small area of abnormal tissue within the atria and causes the heart to beat much faster than usual.

- **Junctional tachycardia** – the abnormal impulse starts from the AV node between the atria and ventricles. This type is more common following heart surgery.
What causes supraventricular tachycardia?

Doctors think that AVRT may be caused by an additional electrical pathway within the heart. The additional pathway was formed as the baby was developing in the womb. The additional pathway makes the heart ‘short circuit’ and pump blood around the body less effectively. Doctors think we all have the potential to develop AVNRT. However, the electricity that speeds through the zone near the AV node is significantly different in some individuals, which causes a variation in symptoms.

What are the signs and symptoms of supraventricular tachycardia?

The symptoms of SVT occur in episodes, which can last for a few seconds to a number of hours. Children may report feeling chest flutters or palpitations, a very fast pulse, breathlessness and dizziness.

How is supraventricular tachycardia diagnosed?

The doctor will take a clinical history, which includes what symptoms have occurred and how long they have been present, and carry out a physical examination. It can be helpful to keep a symptom diary of when the episodes occur and what activities happened beforehand.

They will usually order an electrocardiogram (ECG), which shows the heart rhythm. Sometimes it is difficult to record an episode when it is actually happening, so the doctor may suggest having an ECG over a 24-hour period or longer. An echocardiogram will also be suggested to look at blood flow through the heart.
How is supraventricular tachycardia treated?

Most episodes of supraventricular tachycardia (SVT) only last for a few minutes and do not need urgent treatment. Some episodes may last longer and children may be affected by these. Your child may be given regular medication to reduce or stop the chance of prolonged periods of SVT. This is often a beta blocker medicine to keep the child’s heart rate regular. Other medicines such as flecainide, digoxin and amiodarone can also be used.

It is important you are able to check your child’s heart rate by taking their pulse and we will teach you how to do this. We will also teach you ‘vagal manoeuvres’ which can include blowing in a straw or a balloon. These work on the vagal nerve which regulates the heartbeat.

If an episode lasts for a prolonged period, over 20 minutes, treatment may be needed in hospital. This may involve injecting a medicine called adenosine or exposing the child to ice. If the episode lasts several hours, this may involve an admission to an intensive care unit to receive additional help with breathing, taking medicines to control blood pressure or using defibrillators to ‘shock’ the heart back into a normal rhythm.

What happens next?

If symptoms continue throughout childhood, this usually needs treatment with ablation of the additional pathway. The doctor will use either radio frequency ablation or cryoablation on the affected area, which should stop the abnormal signals. Ablation works by using a targeted beam of energy to destroy the tissues causing the abnormal signals. Radio frequency (RF) ablation burns the area causing the abnormal rhythms and is effective in around 95 per cent of cases. An alternative method, cryoablation, is used where RF ablation is not suitable. Cryoablation freezes the affected area and is effective in about 80 per cent of the cases; however, it is safer to use in certain areas of your heart. This procedure is carried out at low risk and as a day case or with an overnight stay.
Further information and support

There are various organisations that can offer support and advice to anyone affected by supraventricular tachycardia including:

- **Arrhythmia Alliance** – call their helpline on 01789 867501
  or visit their website at www.heartrhythmcharity.org.uk

- **Children’s Heart Federation** – call their information line on 0808 808 5000
  or visit their website at www.chfed.org.uk

- **British Heart Federation** – their helpline is on 0300 330 3311
  or visit their website at www.bhf.org.uk