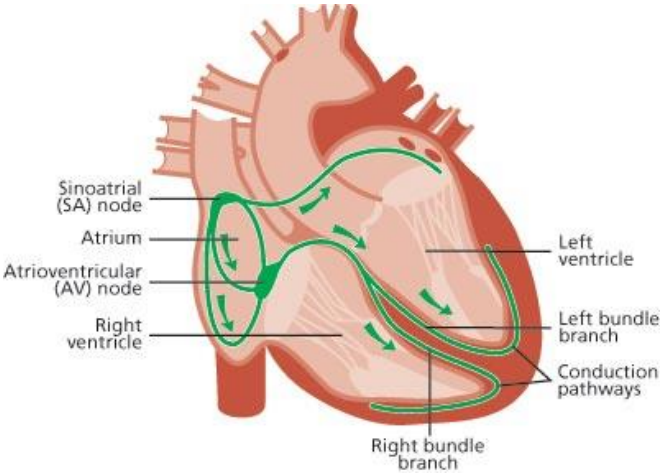
Great Ormond Street Hospital for Children
NHS Foundation Trust

Supraventricular tachycardia: information for families

Supraventricular tachycardia (SVT) 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. This information sheet from Great Ormond Street Hospital describes SVT, what causes it and how it can be treated.

The heart has an electrical system that makes it pump. The 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 travels through the heart each time it beats. It is something that happens naturally – you can't feel it.

What causes supraventricular tachycardia?

SVT may be caused by an additional electrical pathway that forms when the baby's heart is developing in the womb. Sometimes these pathways are active when the baby is born, sometimes they becomes active later on in life.

The additional pathway causes episodes where the heart rate suddenly quickens to an abnormally fast rate, often around 200 beats per minute.

There are several types of supraventricular tachycardia:

- **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.
- **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 tachycardia** – the impulse starts in a small area of abnormal tissue within the atria and causes the heart to beat much faster than usual.
- **Atrial flutter** – the impulse travels around the atria in a circular pattern causing the heart to beat 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 are the 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. In babies or children who are not able to communicate they may seem breathless, pale, irritable or unsettled, and you may be able to feel their heart racing by placing a hand on their chest.

In the majority of cases, the heart rate corrects itself to return to a normal rhythm. The frequency and length of episodes varies from person to person.

Fainting or 'blacking out' is rare and usually only occurs after a prolonged period of heart racing, lasting more than 30 minutes.

How is supraventricular tachycardia diagnosed?

In most cases SVT is diagnosed on an electrocardiogram (ECG) at the time of symptoms of heart racing. Sometimes it is diagnosed by accident, if a person has an ECG as part of a general check-up for instance.

The doctor or nurse practitioner will take a clinical history – that is, what symptoms occurred and how long they have been present. A family history will also be taken

SVT is confirmed using an ECG, which shows abnormal rhythm during an episode. Sometimes it is difficult to record an episode when it is actually happening, so the doctor or nurse practitioner may suggest an exercise test to bring on an episode. Otherwise, they may suggest having an ECG over a 24-hour period or longer or having an implantable loop recorder. An echocardiogram will also be suggested to look at blood flow through the heart.

How is supraventricular tachycardia treated?

For people with symptoms that are affecting their day to day life, or who have significant episodes, medication can be offered. These may be a beta blocker or other medications to help stabilise the pathway and reduce the hearts ability to cause the fast heart rates.

The most effective long term treatment for SVT is cardiac ablation. The doctor will use either radio frequency ablation (heating therapy) or cryoablation (freezing therapy) 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 ablation (heating therapy) is effective in around 90 per cent or more of cases. Cryoablation (freezing therpay), 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. Ablation is successful in the vast majority of cases, so there are no further heart racing episodes.

Managing episodes of supraventricular tachycardia at home

It's important that you are able to recognise the potential signs and symptoms of SVT and we will teach you how to do this. If appropriate, we will also teach you and your child 'vagal manoeuvres' which can include blowing in a straw or a balloon. These work on the vagal nerve which regulates the heartbeat.

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. If an episode is prolonged or the person experiences any of the red flag symptoms, they should be taken to the nearest Accident and Emergency (A&E) department immediately

If an episode lasts for a prolonged period, doctors in the A&E will try some 'tricks' to try to slow the heart. If these are not successful or the SVT is causing other concerns such as low blood pressure they may use a medication. As a last resort a shock can be given as a life-saving option.

Red flags

- Changes in behaviour, lethargy, irritation
- Dizziness or feeling faint (pre-syncope)
- Collapse (syncope)
- Changes in circulation: colour change such as dusky or pale skin, clamminess or cool hands and feet
- Breathlessness or breathing difficulties
- Symptoms of heart racing for longer than 10 minutes, unless discussed with your cardiology team

Further information and support

You can get in touch with the Arrhythmia Service on 020 7405 9200 extension 5298, email them on gos-ecg.tr.gosh@nhs.net or contact them via MyGOSH once you have registered. More information about MyGOSH is at www.gosh.nhs.uk/your-hospital-visit/mygosh

Electro-Physiology Service

There are various organisations in the UK that support people with heart problems.

- The biggest is the British Heart Foundation – their helpline is on 0300 330 3311 or you could visit their website at www.bhf.org.uk
- The Children's Heart Federation offers support and advice – call their helpline on 0300 561 0065 or visit their website at www.chfed.org.uk/
- You could also contact Cardiac Risk in the Young (CRY) on 01737 363 222 or visit their website at www.c-r-y.org.uk.
- Arrhythmia Alliance offers support to anyone affected by abnormal heart rhythms. Call them on 01789 450 787 or visit their website at www.heartrhythmcharity.org.uk