



Arrhythmia Alliance  
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# Inappropriate Sinus Tachycardia (IST)

## What is IST?

Inappropriate Sinus Tachycardia (IST) is a condition in which an individual's resting heart rate is abnormally high – greater than 100 beats per minute or rapidly accelerating to over 100 beats per minute without an identifiable cause for the tachycardia, although small amounts of exercise, emotional or physical stress are triggering factors.

An ECG will not show any abnormalities (other than an abnormally fast heart rate), as IST arises within the sinus node where normal sinus rhythm is generated i.e. the heart rhythm is arising from the normal location but at an inappropriately high rate.

It was first recognised in the late 1970s but remains under appreciated by many in the medical profession and with many doctors regarding it as a psychological condition. Individuals with this condition can find themselves increasingly disabled and experiencing high levels of anxiety.

## Symptoms

IST is more commonly experienced by women than men. Onset of symptoms is often in early adulthood but can present later as well. The main symptoms of IST include:

- ♥ Palpitations
- ♥ Shortness of breath
- ♥ Exercise intolerance
- ♥ Fatigue
- ♥ Resting heart rate of greater than 100bpm
- ♥ Sleeping heart rate of 70 – 90bpm
- ♥ Heart rate will rapidly reach 150bpm upon minimal exertion

## Potentially related symptoms:

- ♥ Drop in blood pressure upon standing
- ♥ Blurred vision
- ♥ Dizziness
- ♥ Syncope
- ♥ Pre-syncope
- ♥ Sweating

## What causes IST?

Unfortunately, to date nobody knows. There is a belief that IST is a result of the sinus node having an abnormal structure. There is another view that individuals with IST might be super-sensitive to adrenaline as the smallest amount of exertion can cause a pronounced rise in the heart rate. However, a number of informed medical professionals believe there are a number of factors and disorders which point to disturbance within the autonomic nervous system. It is for this reason that it is a condition that can be mistaken for, or overlap with, postural tachycardia syndrome (PoTS). Please contact Arrhythmia Alliance for further information.

## How is IST diagnosed?

IST is a diagnosis of exclusion, meaning other potential causes of a fast heart rate (like fever, anxiety, or certain medications) need to be ruled out first.

The following guidelines may help towards securing the correct diagnosis for an individual presenting with IST symptoms.

1. ECG for resting heart rate. A resting heart rate will generally exceed 100bpm to be considered IST. A 24hr ECG/Holter monitor will determine if the average heart rate during a 24 hr period is over 95bpm. When an individual is lying down or sleeping there should be a little reduction in their heart rate.
2. Exercise/stress test - demonstrate an inappropriate heart rate response to exercise
3. Symptoms documented should indicate tachycardia
4. Other known causes of sinus tachycardia must be excluded - these include anemia, hyperthyroidism, pheochromocytoma, diabetes, induced autonomic dysfunction, fever, and dehydration

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5. Sometimes an EP Study will be performed to exclude atrial tachycardia before an IST diagnosis is finally made
6. Echocardiogram – to rule out any structural abnormality of the heart

### Treatment

IST doesn't shorten life expectancy, therefore treatment is aimed at alleviating symptoms. Patients can choose to do nothing, and live with the symptoms if they are not that severe or have little impact on their life. Or they can take medications to try and slow the heart rate, or have an ablation procedure to destroy the heart tissue responsible for the tachycardia. In extreme cases, open heart surgery is an option if symptoms are very severe and if other treatments have failed.

**Medication:** Beta blockers are often tried first; calcium channel blockers (diltiazem or verapamil) are an alternative. These aim to slow the heart rate and reduce symptoms. Where there is an overlap with autonomic dysfunction, Fludrocortisone, Midodrine, and serotonin-reuptake inhibitors have all been used. Ivabradine is also used with success in some people, either on its own or in combination with other drugs. It is important not to make things worse with side effects from the drugs, which may be worse than the symptoms of IST itself.

**Ablation** of the sinus node to either modify it or destroy it completely has been used to try and treat the symptoms of IST but results have been very variable and often not long-lasting. It is therefore rarely performed or recommended currently. However, if there is a possibility of another cause for the abnormal rhythm then it may be appropriate to discuss treatment options with an Electrophysiologist.

### Self help

Cognitive behavioral therapy (CBT) has had some success in helping patients come to terms with IST,

and help manage their lives.

It is very important to recognise that, however disabling symptoms may be, this is not a life threatening disorder and lifespan is normal; with no increased risk of strokes or heart attacks. The number of people who develop any problems with their heart function as a result of a long-term fast heart rate is also very small. So, in some people, the best thing is to wait and see how things develop – it may improve on its own, particularly once a person has been reassured that there is no other sinister problem. Where there is an overlap with autonomic dysfunction, increasing salt and fluid intake may help.

### IMPORTANT POINTS

Where sinus tachycardia is identified it is important to rule out other treatable conditions before making the diagnosis of IST – it may be that there is a curable cause.

IST is not a life threatening condition but symptoms can be very disabling.

A variety of therapies exist, but it is important not to make things worse with any treatment.

The opinion of a specialist, usually an Electrophysiologist, can be helpful.

To view our patient resources, scan the QR code below:



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