

## Wolff-Parkinson-White Syndrome (WPW)

Wolff-Parkinson-White syndrome is a condition that affects the heart's electrical system. It causes episodes of a fast heartbeat (also known as supraventricular tachycardia (SVT)) due to an extra electrical pathway in the heart.

This condition is present at birth (congenital), although symptoms may not appear until later in life. It affects between one and 3 in every 1,000 people. In most cases, the heart is structurally normal.

### Causes

In a normal heart, electrical signals follow a set pathway from the top of the heart (atria) to the bottom (ventricles). People with WPW have an extra electrical connection called an accessory pathway, which can allow signals to bypass the normal route, leading to abnormal heart rhythms.

The heart has its own electrical conduction system which sends signals throughout the heart muscle to make it beat in a regular rhythm. Sometimes an extra pathway exists, which can cause the heart rhythm to change. This extra electrical pathway may be a reason that can cause the heart to beat too quickly (tachycardia), or irregularly which may, in some cases, cause a very fast unstable heart rhythm disorder.

### Signs and symptoms

Some people have no symptoms and just have the ECG abnormality due to the accessory pathway. This is not strictly speaking WPW, but called pre-excitation. The condition is usually

only discovered on routine ECG recording. People may report the following symptoms, varying from mild to severe:

- A fast, racing heartbeat (supraventricular tachycardia)
- Feeling lightheaded or dizzy
- Shortness of breath
- Chest pain
- Sweating
- Feeling anxious
- Syncope (fainting)

Symptoms can last for seconds, minutes or hours, and vary in frequency from daily occurrence to only a few times a year.

### Diagnosis/Investigations

WPW is usually diagnosed with an electrocardiogram (ECG), which records the heart's electrical activity. In WPW, the ECG shows a characteristic pattern, including a short PR interval and a delta wave.

Other tests might include:

- Holter monitor (24-hour ECG)
- Exercise stress test
- Electrophysiological study (EPS) – a detailed test of the heart's electrical system

### Treatment

**Lifestyle changes (for mild cases):**

- Avoid stimulants (caffeine, alcohol, energy drinks)
- Learn how to use vagal maneuvers (eg coughing, bearing down) to stop an episode



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#### Medications:

- Anti-arrhythmic drugs to control heart rhythm (eg flecainide, propafenone)
- Beta blockers or calcium channel blockers may be used in some cases

#### Catheter Ablation:

- A common and often curative treatment
- A thin wire is inserted into the heart through a vein to destroy (ablate) the extra pathway

#### Emergency Treatment:

- If heart rhythm becomes dangerously fast or unstable, emergency cardioversion (shock) may be needed

If your doctor suspects you have WPW, but it is not completely clear on the routine ECG, he/she will advise you to have an adenosine challenge to confirm your diagnosis. This is known as latent pre-excitation. Some patients have intermittent pre-excitation, which means it is not seen on every ECG.

### What is an adenosine challenge?

Adenosine is a naturally occurring substance found in all of us. Adenosine briefly blocks normal conduction through the AV node. The atrioventricular (AV) node acts as a "gatekeeper" between the atria (upper heart chambers) and ventricles (lower heart chambers), receiving electrical impulses from the sinoatrial (SA) node and relaying them to the ventricles. Adenosine, therefore, slows your heart rate and unmasks ECG changes in patients who have a latent of WPW, since the accessory pathway (or bypass tract) is not blocked, and so a fast heart rate still occurs.

Your doctor will administer the drug through a vein in your arm and record your ECG. The ECG will record the effects of the adenosine on the AV node and unmask any presence of an accessory pathway.

### Risks of the test

The adenosine challenge is a well-established and safe clinical test, but as with any procedure there are potential risks. Complications associated with the procedure are very rare, can be treated and are rarely life threatening. If you are asthmatic, please tell your doctor as an injection of adenosine may bring on an asthma attack.

It is common to experience a metallic taste in your mouth during the procedure, and visual disturbances such as double vision may also occur. These side effects usually resolve themselves once the procedure is complete. The adenosine causes your heart to go into a very slow rhythm and if it does not recover quickly you may require external pacing to regulate your heart rhythm (this is extremely rare).

It is important that for the duration of the procedure, if you feel any palpitations, dizziness, or uncomfortable symptoms you inform your nurse or doctor.

### After the test

If the test result is negative, your doctor will consider your individual risk, and advise you if further tests are needed to be performed. It is likely that you will be able to go home a few hours after the test. However, it is advisable



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that you do not drive, and that you have someone with you for the rest of the day after the test.

If the test is positive, and you may be at risk of a fast heart rhythm developing, your doctor may suggest you have an electrophysiology (EP) study and possible catheter ablation. The EP study is an invasive procedure, where catheters are placed within the heart via the vein at the top of your leg.

With regard to lifestyle modifications, it is important to avoid illicit or recreational drugs, such as cocaine, ecstasy and other stimulants, as these can be dangerous in this condition.

### What about my family and relatives?

There is very little evidence of any genetic or familial form of WPW. It is thought to be caused by a small heart muscle fibre which becomes stranded slightly out of place during development in the womb. If there is any major concern about a relative, then a simple 12-Lead ECG test can be used to screen them for WPW or pre-excitation.

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



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