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What is the Wolff-Parkinson-White syndrome (WPW)?

Wolff-Parkinson White Syndrome (WPW) is a condition in which the heart beats too fast due to abnormal, extra electrical pathways between the heart's upper and lower chambers. In a normal heart, the electrical signal moves from the heart's upper chambers (the atria) to the lower chambers (the ventricles), causing the heart to beat. If there's an extra conduction pathway, the electrical signal may cause a rapid heart rate (tachycardia). WPW can be present at birth (congenital), but the highest incidence is between 30 and 40 years of age. It is one of the most common causes of fast arrhythmia in infants and children.

What are the symptoms of arrhythmias?

The effects on the body are often the same whether the heartbeat is too fast, too slow, or too irregular. Some symptoms of arrhythmias include, but are not limited to: weakness, fatigue, palpitations, low blood pressure, dizziness or fainting. The symptoms of arrhythmias may resemble other conditions. Consult your physician for a diagnosis.

To better understand arrhythmias, it is helpful to understand the heart's electrical conduction system.

The heart's electrical system:

The heart is, in the simplest terms, a pump made up of muscle tissue. Like all pumps, the heart requires a source of energy in order to function. The heart's pumping action comes from an intrinsic electrical conduction system. An electrical stimulus is generated by the sinus node, which is a small mass of specialized tissue located in the right atrium of the heart. The sinus node generates an electrical stimulus regularly. This electrical stimulus travels down through the conduction pathways and causes the heart's lower chambers to contract and pump out blood. The right and left atria of the heart are stimulated first and contract for a short period of time before the right and left ventricles.

Any dysfunction in the heart's electrical conduction system can make the heartbeat too fast, too slow, or at an uneven rate, thus causing an arrhythmia. Normally, as the electrical impulse moves through the heart, the heart contracts about 60 to 100 times a minute. Each contraction of the ventricles represents one heartbeat.

How are arrhythmias diagnosed?

There are several different types of procedures that may be used to diagnose arrhythmias. WPW can be recognized by certain changes on the electrocardiogram, which is a graphical record of the heart's electrical activity. The ECG will show that an extra pathway or shortcut exists from the atria to the ventricles.

Other procedures include:

- **Resting ECG:** For this procedure, the clothing on the upper body is removed and small sticky patches called electrodes are attached to the chest, arms, and legs. These electrodes are connected to the ECG machine by wires. The ECG machine is then started and records the heart's electrical activity for a minute or so.
- **Exercise ECG, or stress test:** The patient is attached to the ECG machine as described above. However, rather than lying down, the patient exercises by walking on a treadmill or pedaling a stationary bicycle while the ECG is recorded.
- **Signal-average ECG:** This procedure is done in the same manner as a resting ECG, except that the heart's electrical activity is recorded over a longer period of time, usually 15-20 minutes.
- **Electrophysiologic studies (EPS):** This is an invasive test in which a small catheter (hollow tube) is inserted through the groin or neck into the heart. This gives the physician the capability of finding the site of the arrhythmia's origin within the heart tissue, thus determining how to best treat it.
- **Holter monitor:** A Holter monitor is an ECG recording done over a period of 24 or more hours. Three electrodes are attached to the patient's chest and connected to a small portable ECG recorder by lead wires.

How is WPW treated?

People without symptoms usually don't need treatment. People with episodes of tachycardia can often be treated with medication. The most common procedures used to interrupt the abnormal pathway are radiofrequency or catheter ablation. An ablation is an invasive procedure done in the electrophysiology laboratory, which means

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that a catheter (hollow tube) is inserted into the heart through a vessel in the groin or arm. Then that tissue is destroyed with radiofrequency energy, stopping the electrical pathway.

Other treatments for arrhythmias include:

- **Lifestyle modification:** Factors such as stress, caffeine, or alcohol can cause arrhythmias.
- **Medication:** There are various types of medications which may be used to treat arrhythmias.
- **Cardioversion:** In this procedure, an electrical shock is delivered to the heart through the chest to stop certain very fast arrhythmias.
- **Surgery:** Surgical treatment for arrhythmias is usually done only when all other appropriate options have failed.