

## Arrhythmia classification using CNN

*'Hear Arrhythmia' is the condition of irregular heart rhythms. There are variations in the heartbeat patterns. When electrical signals that were meant to coordinate with the heartbeats falter, this condition takes place. The heart could beat faster, or slower, or any other form of irregularity is usually noticeable. Some basic fluttery feeling is harmless. It may speed up during active periods of the body and slow down during relaxing periods. The level of symptoms is important to look for because some of them can even be life-threatening. There might not be obvious signs of Arrhythmia. One might need a medical professional to figure it out, but the subtle details to look for are;*


1. A fluttering feeling in the chest
2. The feeling of heartbeats slowing down or speeding up
3. Breathlessness
4. Pain in the chest area
5. Heavy sweating
6. Dizziness
7. Fatigue
8. Lightheadedness or fainting
9. Anxiety



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## Diagnosis of Arrhythmia



- 1. Electrocardiograms (ECG):** Can detect electrical activity of the heart.
- 2. Echocardiograms:** Uses sound waves to produce images of the heart.
- 3. Implantable loop recorder:** It can be implanted under the skin around the heart, to record its status.
- 4. recorder:** It's like a wearable ECG. It is supposed to be alerted when you have symptoms.
- 5. Holter Monitor:** It's another mobile ECG device which is temporarily used to record the activity of the heart.

Other tests that can be used are, Stress test, where you are made to do a physical activity and the activity of your heart is recorded. Tilt-table test is used for fainting cases, where you lie flat on the table while recording your heart status. EP testing and mapping can also be used where tubes with electrode ends are used inside your body to find details.

## Treatment - Medications

Drugs like blood thinners are recommended by doctors as per the condition of the patient. There are two therapies to treat heart issues---

- 1. Cardioversion:** Shock is delivered to the heart using patches on the chest which coordinates the electrical impulses.
- 2. Vagal maneuvers:** Controls the nervous system, which in turn slows down the heart beats. Used for faster heart beat conditions.

## Surgeries

- 1. Ablation:** Catheters are used in the blood vessels connected to the heart.

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## Types of Arrhythmia

Arrhythmias are usually categorized based on the speed of heart rate. The six main categories would be-

1. **Normal**
2. **Left Bundle Branch Block**
3. **Right Bundle Branch Block**
4. **Ventricular Fibrillation**
5. **Premature Atrial Contraction**
6. **Premature Ventricular Contractions**

### 1.Left Bundle Branch Block:

A delay or blockage of electrical impulses to the left side of the heart. Left bundle branch block sometimes makes it harder for the heart to pump blood efficiently through the circulatory system. Most people don't have symptoms. If symptoms occur, they include fainting or a slow heart rate. If there's an underlying condition, such as heart disease, that condition needs treatment. In patients with heart failure, a pacemaker can also relieve symptoms as well as prevent death.

### 2.Premature Atrial Contraction:

Premature atrial contractions (PACs) are extra heartbeats that start in the upper chambers of your heart. When the premature, or early, signal tells the heart to contract, there may not be much blood in the heart at that moment. That means there's not much blood to pump out.

### 3.Premature Ventricular Contractions:

Premature ventricular contractions (PVCs) are extra heartbeats that begin in one of the heart's two lower pumping chambers (ventricles). These extra beats disrupt the regular heart rhythm, sometimes causing a sensation of a fluttering or a skipped beat in the chest. In the vast majority of cases, PVCs have no known cause and occur spontaneously. Common known etiologies include excess caffeine consumption, excess

