



UNDERSTANDING HEART BLOCK

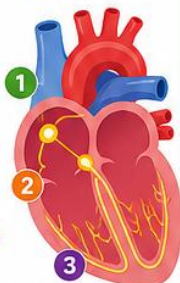


Heart block is a condition in which the electrical signals that control the heartbeat are delayed or interrupted as they travel from the upper chambers (atria) to the lower chambers (ventricles). Depending on the severity, heart block can be harmless or may require treatment such as a pacemaker.

HOW THE HEART'S ELECTRICAL SYSTEM WORKS

The heart beats because of electrical impulses that travel through a specialized conduction system:

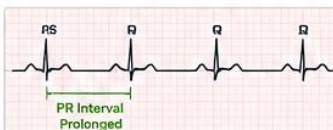
- 1 SA Node**
The heart's natural pacemaker.
- 2 AV Node**
Receives signals from the atria.
- 3 His-Purkinje System**
Carries signals to the ventricles.



Heart block occurs when conduction through the AV node or the His-Purkinje system is slowed or interrupted.

TYPES OF HEART BLOCK

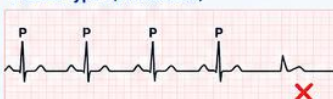
1 FIRST-DEGREE AV BLOCK



- All electrical impulses reach the ventricles, but more slowly than normal.
- Seen as a prolonged PR interval on ECG.
- Usually causes no symptoms.
- Often requires no treatment.

2 SECOND-DEGREE AV BLOCK

Mobitz Type I (Wenckebach)



- Progressive slowing of conduction until one beat is dropped.
- Often benign.
- Common during sleep, in athletes, or with increased vagal tone.
- Rarely requires treatment.

Mobitz Type II



- Sudden failure of conduction without progressive slowing.
- More serious than Type I.
- May progress to complete heart block.
- Often requires pacemaker implantation.

3 THIRD-DEGREE (COMPLETE) HEART BLOCK



- No electrical signals pass from the atria to the ventricles.
- Atria and ventricles beat independently.
- Can cause severe bradycardia (slow heart rate).
- Usually requires permanent pacemaker implantation.



SYMPTOMS

Many patients have no symptoms, especially with mild forms.

- ✓ Fatigue
- ✓ Dizziness
- ✓ Lightheadedness
- ✓ Exercise intolerance
- ✓ Shortness of breath
- ✓ Chest discomfort
- ✓ Fainting (syncope)
- ✓ Near-fainting episodes
- ✓ Sudden cardiac arrest (rare, severe cases)



CAUSES OF HEART BLOCK

IN ADULTS

- Aging of the conduction system
- Coronary artery disease
- Prior heart attack
- Cardiac surgery
- Cardiomyopathy
- Myocarditis
- Lyme disease
- Medications:
 - Beta-blockers
 - Calcium channel blockers
 - Digoxin
 - Antiarrhythmic medications



IN CHILDREN

- Congenital heart block
- Maternal autoimmune disease (anti-Ro/SSA or anti-La/SSB antibodies)
- Following congenital heart surgery
- Congenital heart defects



CONGENITAL COMPLETE HEART BLOCK

Congenital complete heart block is a rare condition in which a baby is born with complete interruption of electrical conduction between the atria and ventricles.

CAUSES

- Maternal lupus or autoimmune antibodies
- Structural congenital heart disease
- Idiopathic (unknown cause)

WARNING SIGNS

- ♥ Slow heart rate
- ♥ Fatigue
- ♥ Poor feeding in infants
- ♥ Exercise intolerance
- ♥ Syncope

Many children remain stable for years but require lifelong cardiology follow-up.



HOW HEART BLOCK IS DIAGNOSED



Electrocardiogram (ECG)
Primary diagnostic test. Identifies the degree and type of AV block.



Holter Monitor
Continuous ECG recording for 24-48 hours or longer.



Event Monitor
Used for intermittent symptoms.



Echocardiogram
Evaluates heart structure and function.



Exercise Stress Test
Assesses conduction during exercise.



Electrophysiology Study (EPS)
Occasionally needed to localize the conduction abnormality.

WHEN IS A PACEMAKER NEEDED?



- ✓ Complete (third-degree) AV block
- ✓ Symptomatic second-degree AV block
- ✓ Mobitz Type II AV block
- ✓ Congenital complete heart block with:
 - Symptoms
 - Ventricular dysfunction
 - Very slow heart rates
 - Wide QRS escape rhythms
 - Ventricular ectopy

LONG-TERM OUTLOOK

The prognosis depends on the type of heart block:

TYPE	PROGNOSIS
First-Degree AV Block	Excellent 😊
Mobitz I	Usually excellent 😊
Mobitz II	Can progress; often needs pacemaker 😐
Complete Heart Block	Excellent after pacemaker implantation 😊
Congenital Complete Heart Block	Usually good with proper monitoring and treatment 😊



WHEN TO SEEK URGENT MEDICAL ATTENTION

Seek immediate medical evaluation for:

- ! Fainting
- ! Recurrent dizziness
- ! Chest pain
- ! Severe fatigue
- ! Shortness of breath
- ! Extremely slow heart rate
- ! New symptoms in a patient known to have heart block



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Early diagnosis and regular follow-up with a pediatric or adult cardiologist help ensure excellent long-term outcomes for most patients.