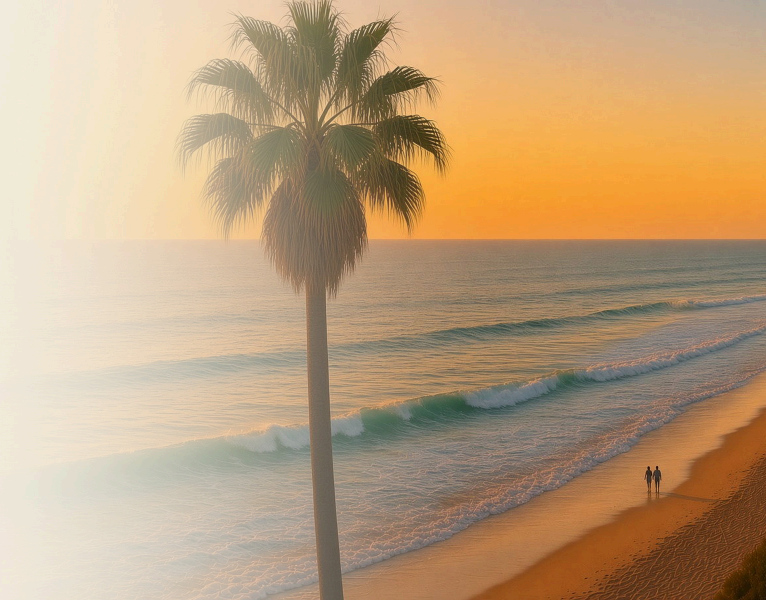
DAMIANRASCH.COM

DAMIAN RASCH, D.O.

ENCINITAS · LA JOLLA, CALIFORNIA



Leadless Pacemakers

A complete pacemaker in one small capsule that sits inside the heart, with no wires and no chest pocket.

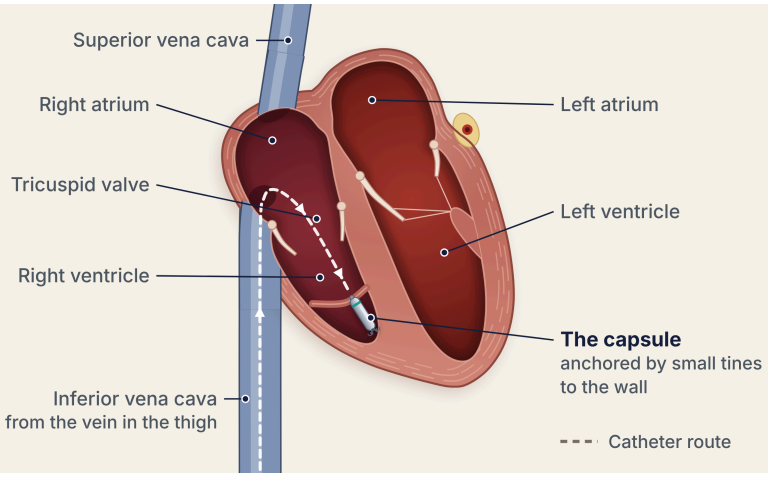
26 mm
long and 6.7 mm across, roughly. About the size of a large vitamin.

Under 1 hour
typically, for the whole procedure, through a vein at the top of the thigh

14 to 17 years
median expected battery life in real-world registry estimates

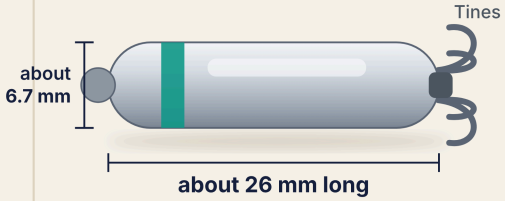
HOW IT WORKS

The whole pacemaker sits inside the heart



The whole pacemaker in one capsule

Battery, electronics and pacing tip together.
No wires and no pocket under the skin.



About two grams, roughly the size of a large vitamin.

Drawn larger than life

A thin tube called a catheter carries the capsule from the femoral vein at the top of the thigh up to the right ventricle. Small tines anchor it to the wall, and the catheter is withdrawn.

COMPARED WITH A TRADITIONAL PACEMAKER

What goes away without wires or a pocket

The chest pocket
No chest incision, no visible bump and no pocket to bleed or get infected.

Device infections
The Micra registry has recorded essentially no device infections that needed removal.

Wire problems
No lead to fracture or block a vein. Major complications ran about 4.5 percent at five years, versus roughly 8.5 percent at three years with traditional systems.

Nothing to see or feel

The device sits inside the right ventricle, so there is no bump and nothing to touch from the outside. Both Micra AV models are MRI-conditional, meaning scans are safe under specific conditions. Tell the MRI technologist you have one.

IS IT RIGHT FOR YOU

Who it suits and what to expect

THE CLASSIC CANDIDATE HAS ONE OF THESE

Heart block	High-degree AV block (the upper-chamber signal doesn't get through) that needs permanent pacing.
A slow heartbeat with AFib	A slow heartbeat with atrial fibrillation, where the upper chamber doesn't need pacing.
A past device problem or hard-to-use veins	A problem with an earlier device pocket (no chest pocket means less infection risk), or blocked or damaged veins under the collarbone.
Frailty, older age or kidney disease	Less surgery means less risk. It also suits people who can't lie still through a longer procedure.

USUALLY NOT THE RIGHT CHOICE

The route in is blocked	A mechanical tricuspid valve, a filter in the inferior vena cava, severe disease of the thigh vein, or anatomy that makes placement unsafe.
The upper chamber needs steady pacing	Sinus node dysfunction (an unreliable natural pacemaker) usually suits a two-chamber pacemaker or the Aveir DR, leadless devices in atrium and ventricle.

1 Before
You arrive in the morning without eating, and an IV goes in. Most people get light sedation, with no general anesthesia.

2 During
After numbing the upper thigh, the doctor places and tests the device under live X-ray.

3 After
A few hours of bed rest let the groin site seal, and many people go home the same day.

RECOVERY AND THE YEARS AHEAD

The first few days	Avoid heavy lifting and strenuous lower-body exertion to protect the groin site. There are no arm or shoulder limits, and you won't need a sling.
Battery life	About 12 years by the maker's projection, and a median of 14 to 17 years in registry estimates, depending on how often it paces.
A worn-out battery	A Micra is usually left in place, with a new one placed elsewhere in the right ventricle. Two and even three can sit together. An Aveir is designed to be retrieved.
Risks to discuss	A puncture of the heart wall is uncommon but can let fluid collect around the heart. Groin bleeding happens in a small percentage, and dislodgement is rare.

CALL 911 AFTER THE IMPLANT

a small stable bruise or mild groin soreness is an office call

Emergencies	Stroke signs, chest pain, sudden breathlessness, or fainting (fluid can collect around the heart).
Groin bleeding	Bleeding that won't stop after 10 minutes of firm pressure.

HOW DOES IT KEEP THE BEAT IN STEP?

The Micra AV has a motion sensor that feels the upper chamber contract and paces the lower chamber in time. In the MARVEL 2 study it kept them in step roughly 89 percent of the time at rest, in complete heart block with a normal upper-chamber rhythm.

READ THE FULL ARTICLE

damianrasch.com/leadless-pacemaker

For education only, and not a substitute for advice from your own physician. Sources include the MARVEL 2 study (2020), the 5-year Micra post-approval registry (European Heart Journal 2024), Reynolds et al. (NEJM 2016), the Aveir DR i2i study (NEJM 2023), Vamos et al. (2025) and the Micra AV2 manual.

DR. DAMIAN RASCH, D.O. · BOARD-CERTIFIED INVASIVE CARDIOLOGIST · ENCINITAS AND LA JOLLA, CA

MADE IN CALIFORNIA