



# Cardiac pacemakers in medicine

Pacemakers and heart failure

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## Heart failure



The pumping function of the heart has become inefficient, leading to breathlessness, fatigue, and ankle swelling.

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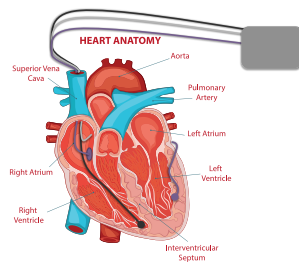
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## Biventricular pacemaker

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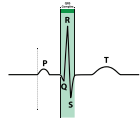
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## Suitable for all HF?



- QRS  $\geq 120$ ms
- Ejection fraction  $< 35\%$

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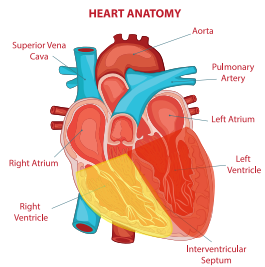
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## Dyssynchrony of the ventricles

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## Basic physics

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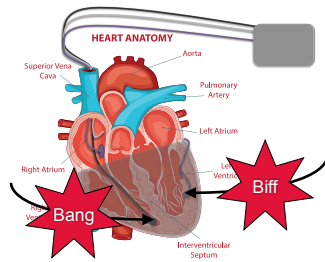
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### Biventricular pacemaker

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### Biventricular pacing



**100%**

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### Takeaway message



Biventricular pacemakers work best when they are pacing the ventricles **100% of the time.**

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