TEMPORARY/EXTERNAL CARDIAC PACING by Nick Mark MD

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DEFINITIONS:

- [Transvenous](#) & [epicardial](#) **pacing** are temporary methods of supporting brady- & tachydysrhythmias until resolution or definitive treatment (such as a permanent implanted pacemaker) can be implanted.
- External cardiac pacing involves connecting one or more pacing **electrodes** (called **leads**) to an external **pulse generator** (also called an **external pacer box**).
- **Transvenous** and **epicardial** pacing are more reliable and more durable treatments than **transcutaneous** pacing. (Both are pictured, though would not be used *simultaneously*.)

USES:

- Pacing can be used to support patients with severe **BRADYCARDIA** or **HEART BLOCK** leading to hemodynamic compromise. HB or bradycardia may be due to surgery, MI, electrolyte disturbances, toxicities.
- **OVERDRIVE PACING** is a technique for [suppressing arrythmias](#) (such ventricular tachycardia or *Torsades de pointes*) by selecting a rate faster than the arrythmia to ***overdrive suppress*** it then decreasing the rate once the dysrhythmia is suppressed.

INITIATING PACING:

Initiating emergency pacing

Set the **MODE** to asynchronous (either VOO or DOO)

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Set the desired **RATE** (should be more than the native HR to initiate pacing; typically 80 bpm).

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Set the **OUTPUT** to the maximum energy & confirm mechanical **CAPTURE** (feel a pulse, look pulseOx/Aline waveform)

Setting the pacer as a backup

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Determine **THRESHOLD** by decreasing **OUPUT** until capture is lost; set the **OUTPUT** to twice the **THRESHOLD**

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Change to a sensing **MODE** (either VVI or DDD)

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Temporarily decrease **RATE** to be less than the native HR

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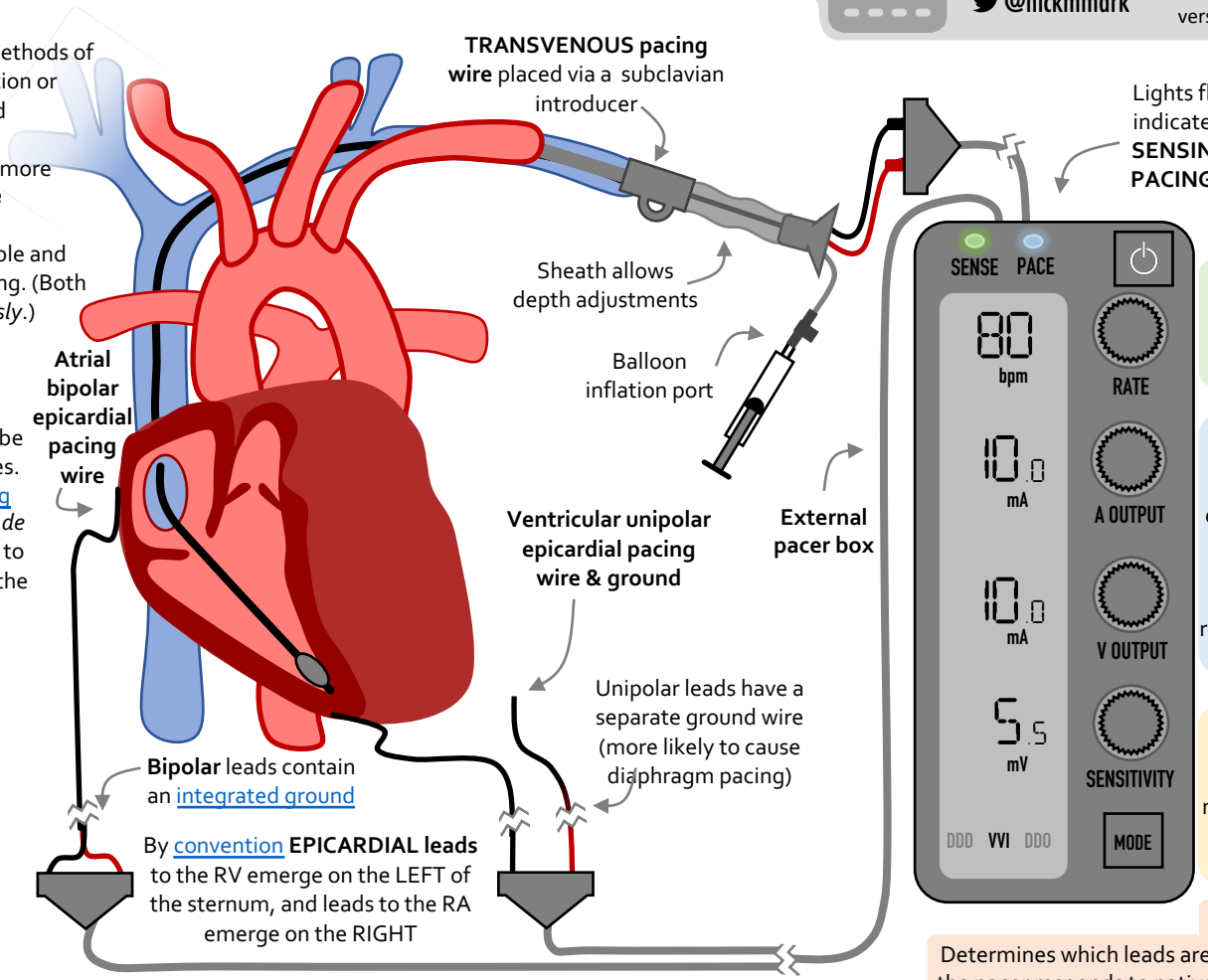
Adjust **SENSITIVITY** until the native complexes are detected

Repeat daily



RATE determines how often the pacer will fire

OUTPUT determines how much energy is delivered to each pacing lead; threshold is how much energy is required to trigger depolarization

SENSITIVITY determines how much current must be detected to identify a depolarization

MODE

Determines which leads are paced and how the pacer responds to native cardiac activity

VVI

CHAMBER PACED	CHAMBER SENSED	RESPONSE TO SENSING
A - atrial	A - atrial	I - inhibited
V - ventricle	V - ventricle	T - triggered
D - dual	D - dual	D - dual
	O - none	O - none

MODE	DESCRIPTION	PROs	CONs
VVI	Common mode used via transvenous pacer wire	On demand V pacing; good for backup	Loss of atrial kick Difficult to assess ST segments with V pacing
VOO	Can be used when sensing is not reliable	Resistant to interference	Loss of [atrial kick](#) Risk of R on T
DDD	Common mode for pacing via epicardial pacing wires	Maintains atrial kick	Risk of [endless loop tachycardia](#)
DOO	Can be used when sensing unreliable	Maintains atrial kick & resistant to interference	Risk of [R on T phenomenon](#)