




5 Tips for Optimising temporary pacing postoperatively

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Helpful
Tips

1. Stop the meddlers!

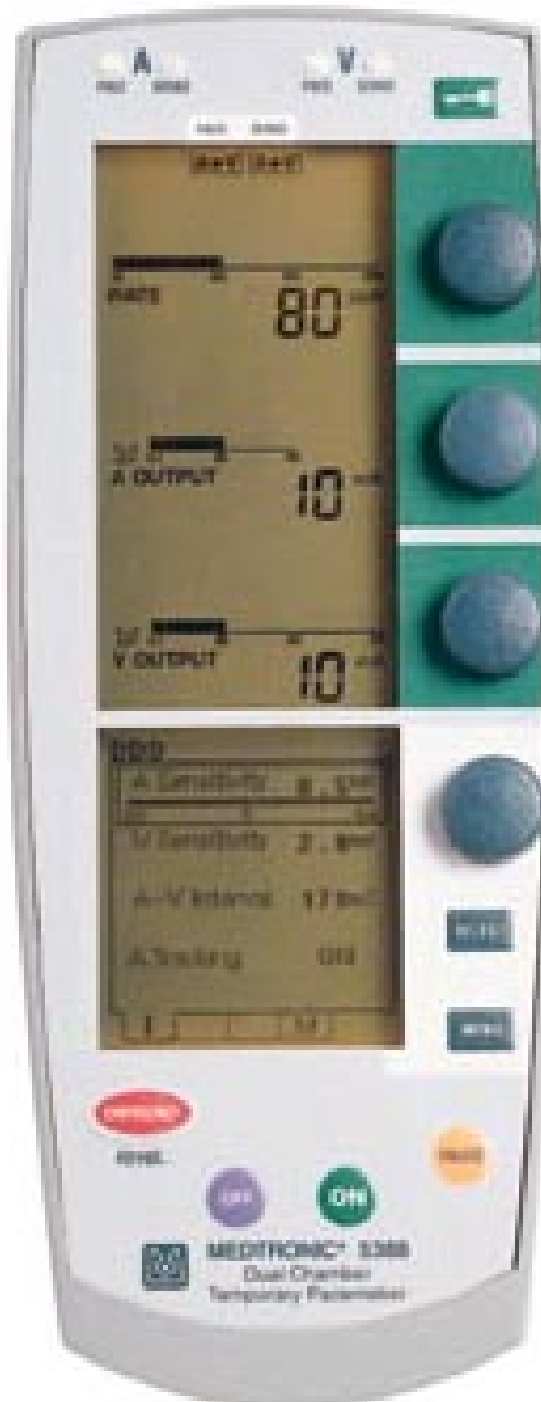





Table I.

The Revised NASPE/BPEG Generic Code for Antibradycardia Pacing

Position:	I	II	III	IV	V
Category:	Chamber(s) Paced	Chamber(s) Sensed	Response to Sensing	Rate Modulation	Multisite Pacing
	O = None A = Atrium V = Ventricle D = Dual (A + V)	O = None A = Atrium V = Ventricle D = Dual (A + V)	O = None T = Triggered I = Inhibited D = Dual (T + I)	O = None R = Rate modulation	O = None A = Atrium V = Ventricle D = Dual (A + V)
Manufacturers' designation only:	S = Single (A or V)	S = Single (A or V)			





Helpful
Tips

2. Get surgeons to place
epicardial leads



Who needs pacing wires post op?



- **Fishberger et al, CITY 2008 (Miami)**
 - 1193 surgical procedures 2003-2005
 - Median age 5.8months (range 0-54years)
 - Temporary pacing wires placed 14 times (1.2%)
 - 0.3%required permanent pacemaker
 - JET in 0.8% - all managed without pacing

Who needs pacing wires post op?

Snyder et al, JThorac Cardiovasc Surg 2007 **(Connecticut Children's)**

170/209 (81%) had epicardial pacing wires

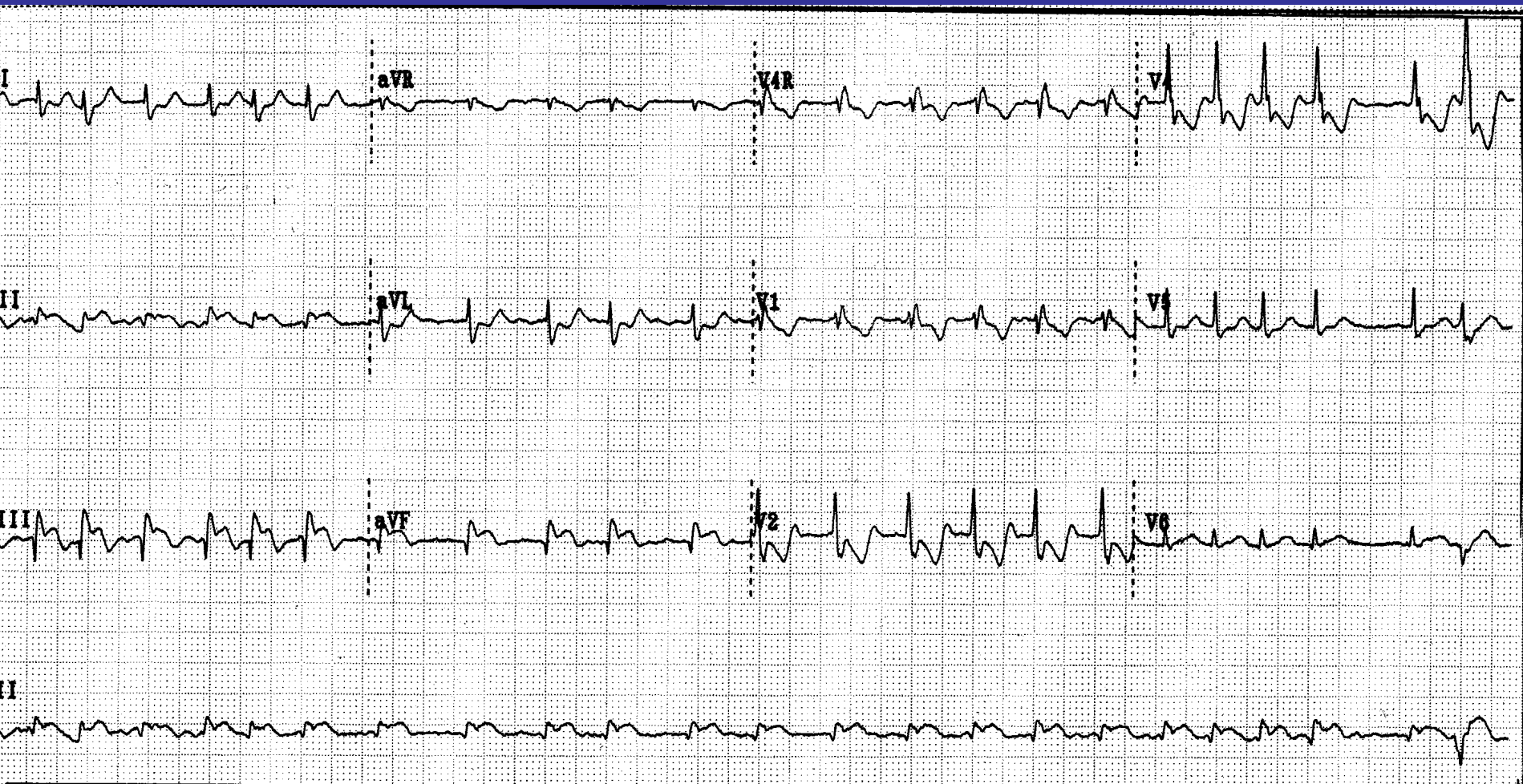
Wires used in 59 (35% of those who had pacing wires: 33 for diagnoses, 11 for therapy (15 for both)

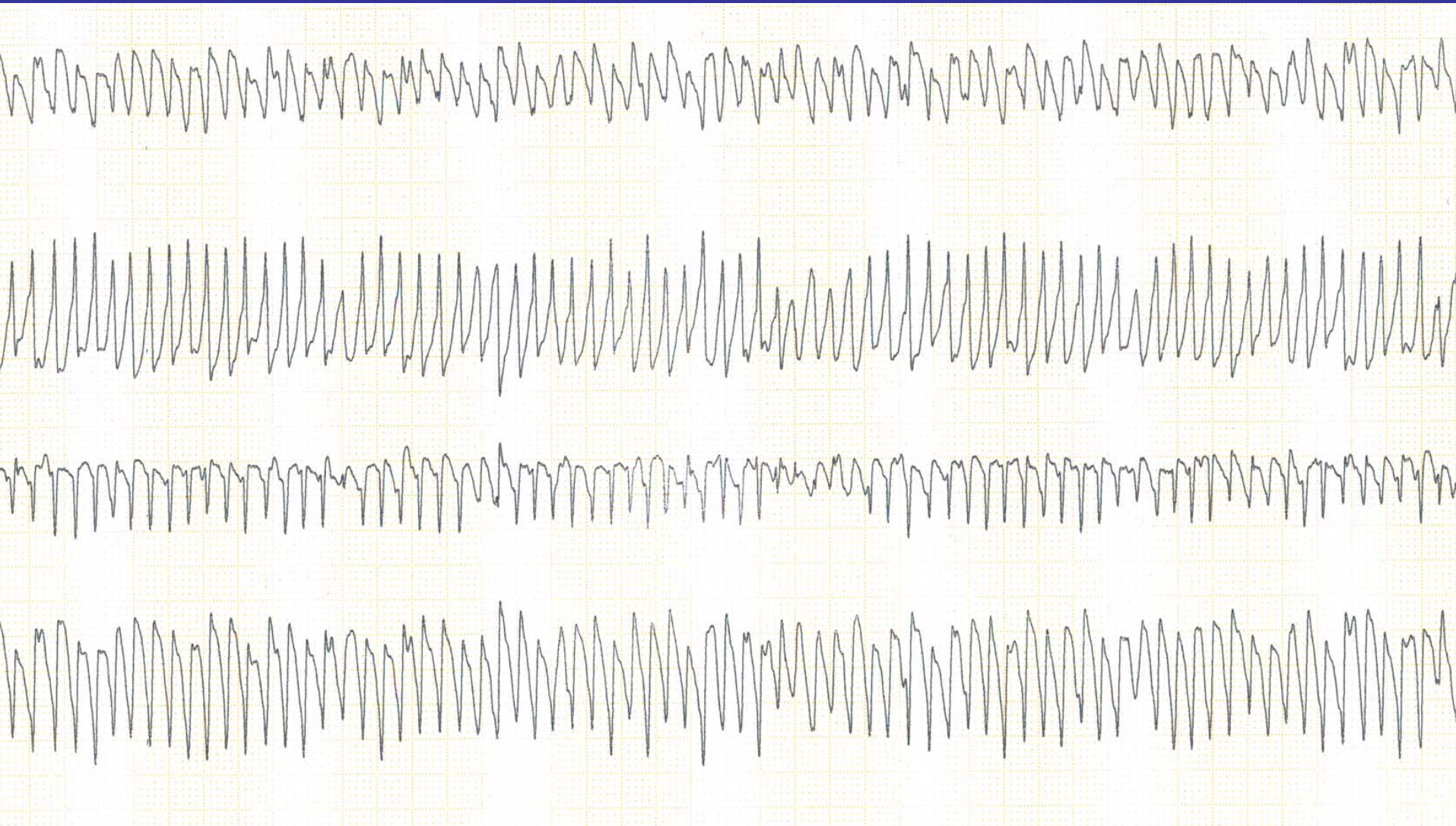
More likely if long X-clamp or CPB time


Surgeons could predict 100% who would NOT need pacing leads, but not 100% who definitely would!

Complication rate 0-1.2%!



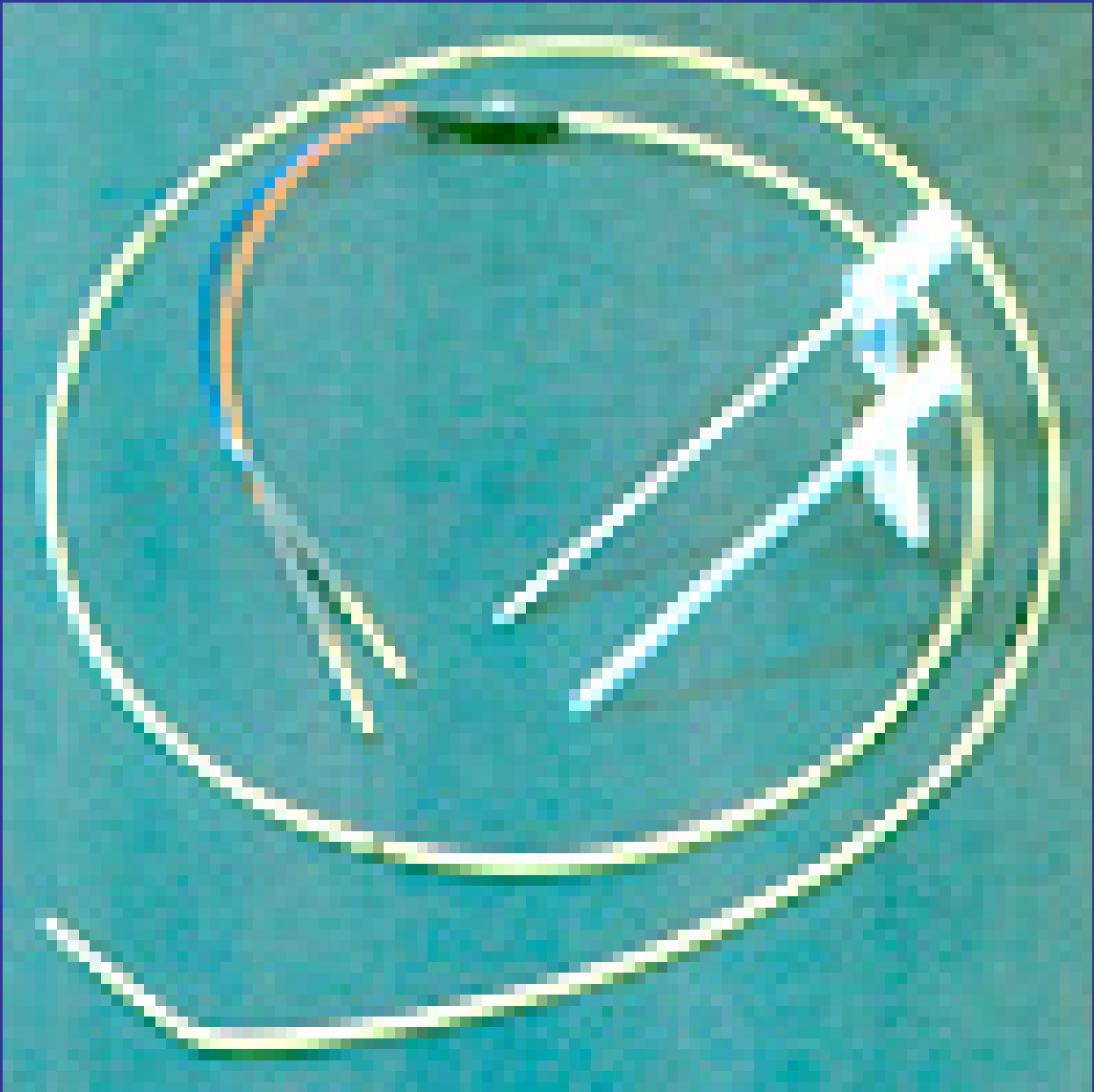


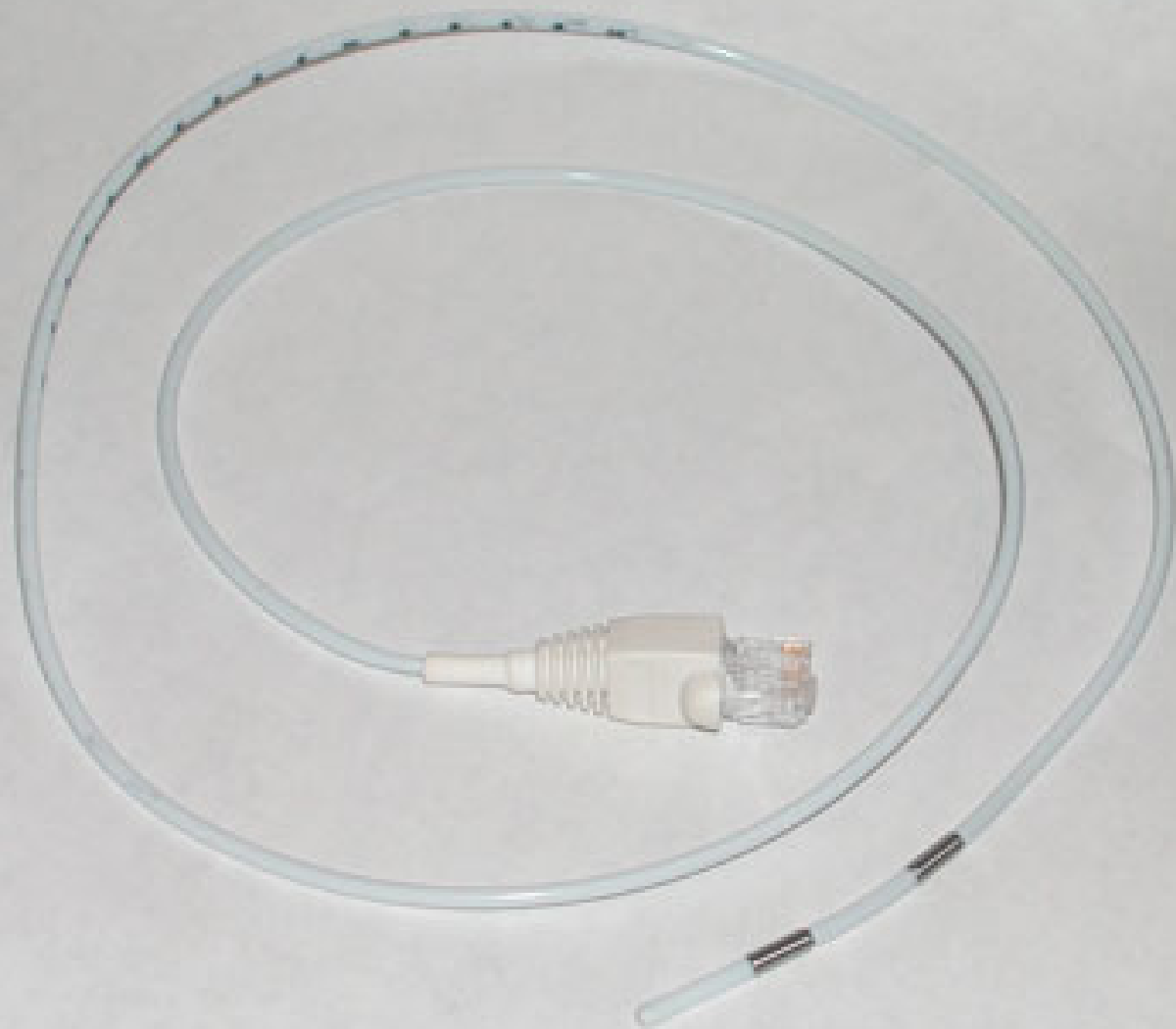


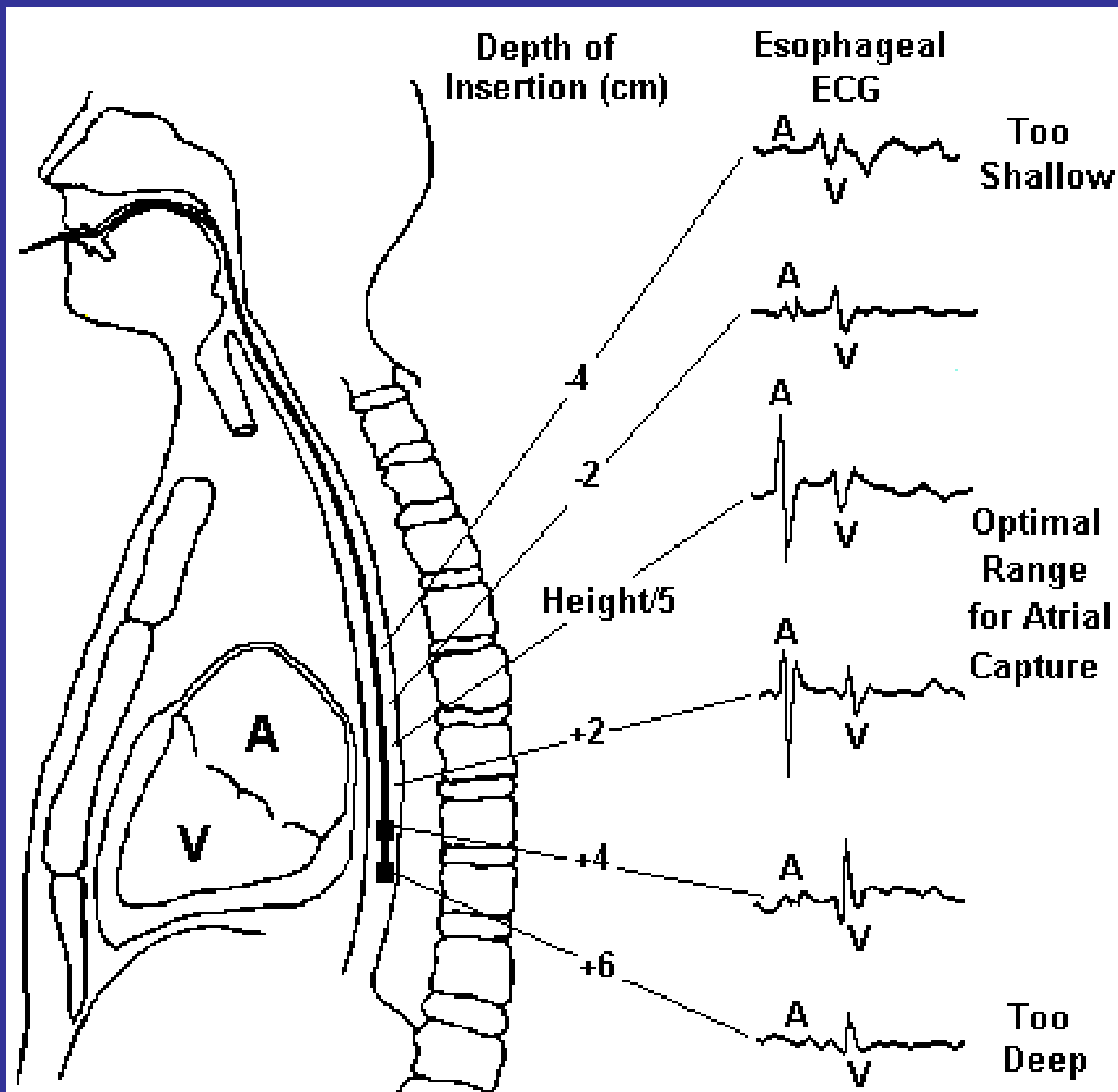


Helpful
Tips

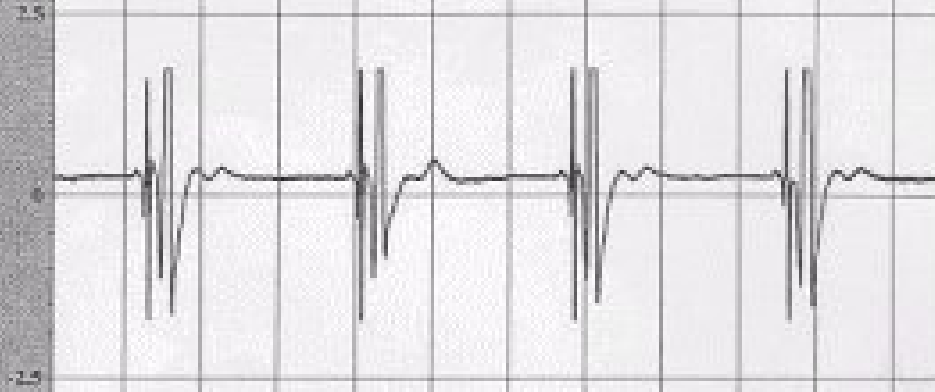
3. Know how to do
oesophageal pacing



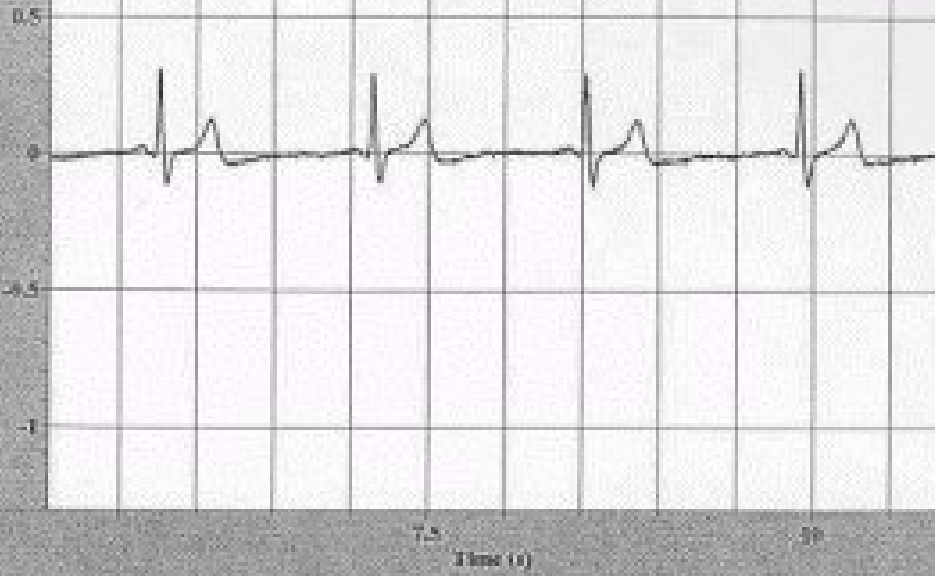




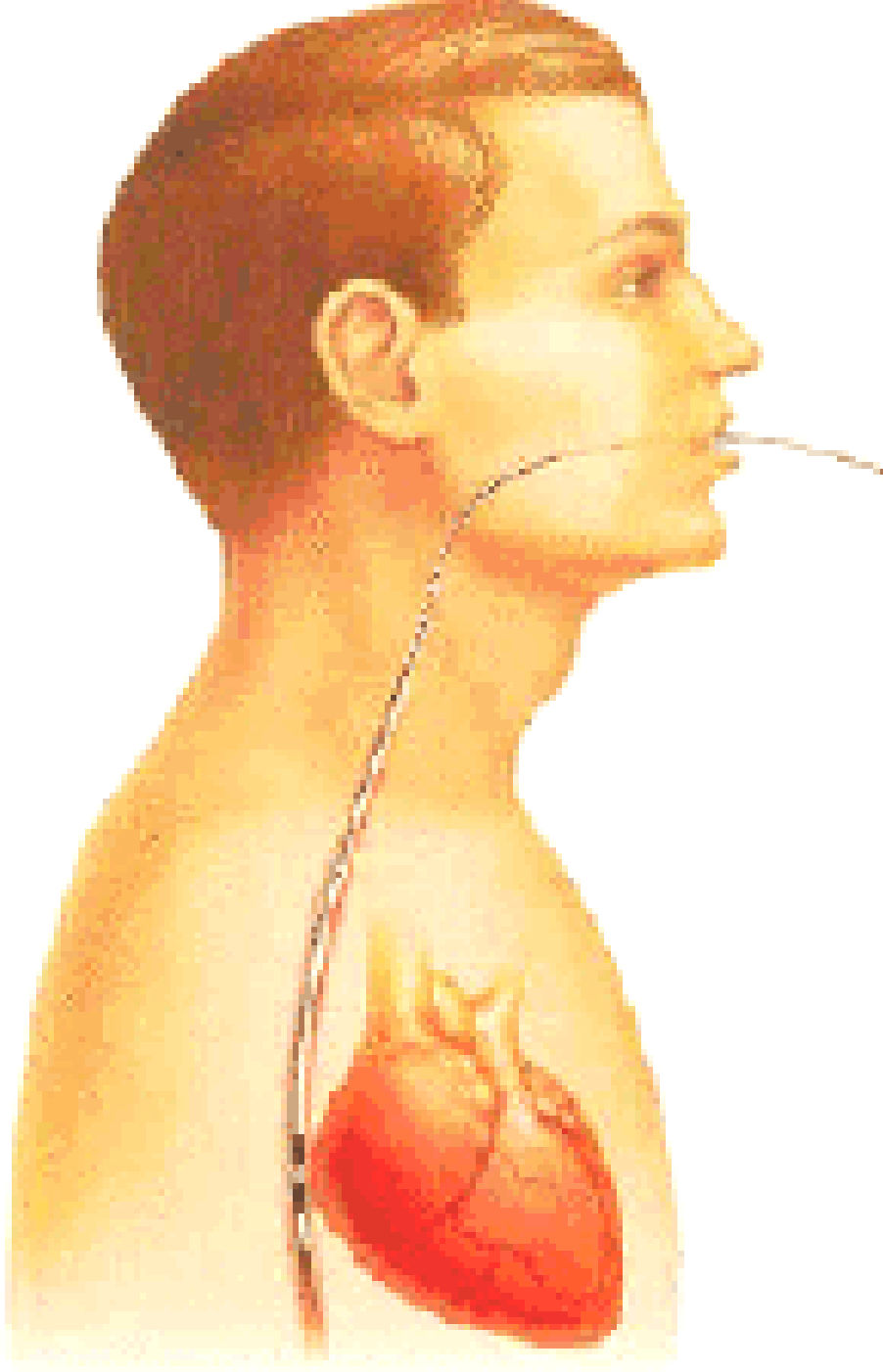
Esophageal ECG



Surface ECG



Time (s)
0 7.5 15 22.5 30





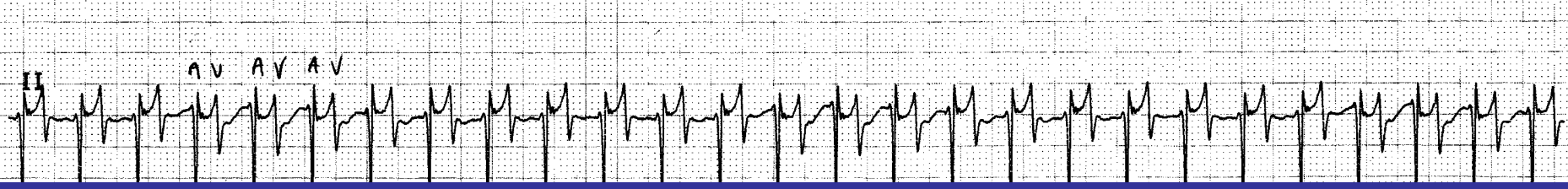
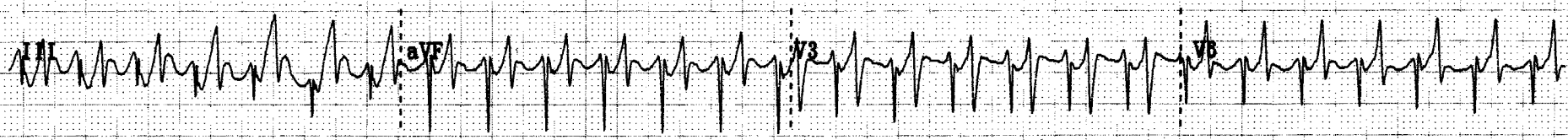
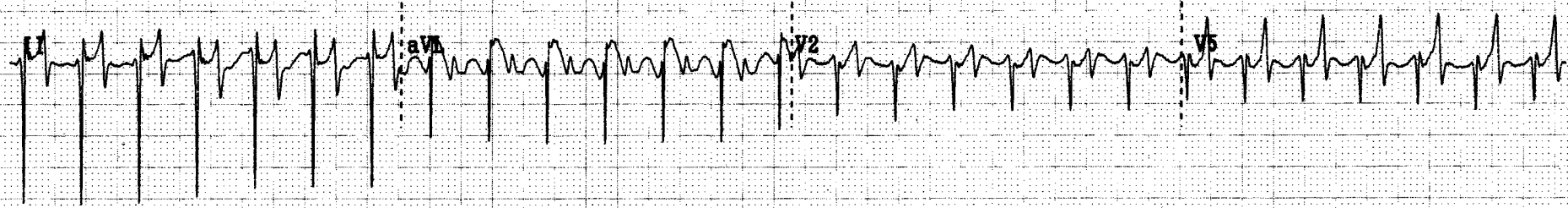
BP: HR: 159


**** UNCONFIRMED REPORT ****

Durations
Axes

P: QRS: 112
P: QRS: ? T:

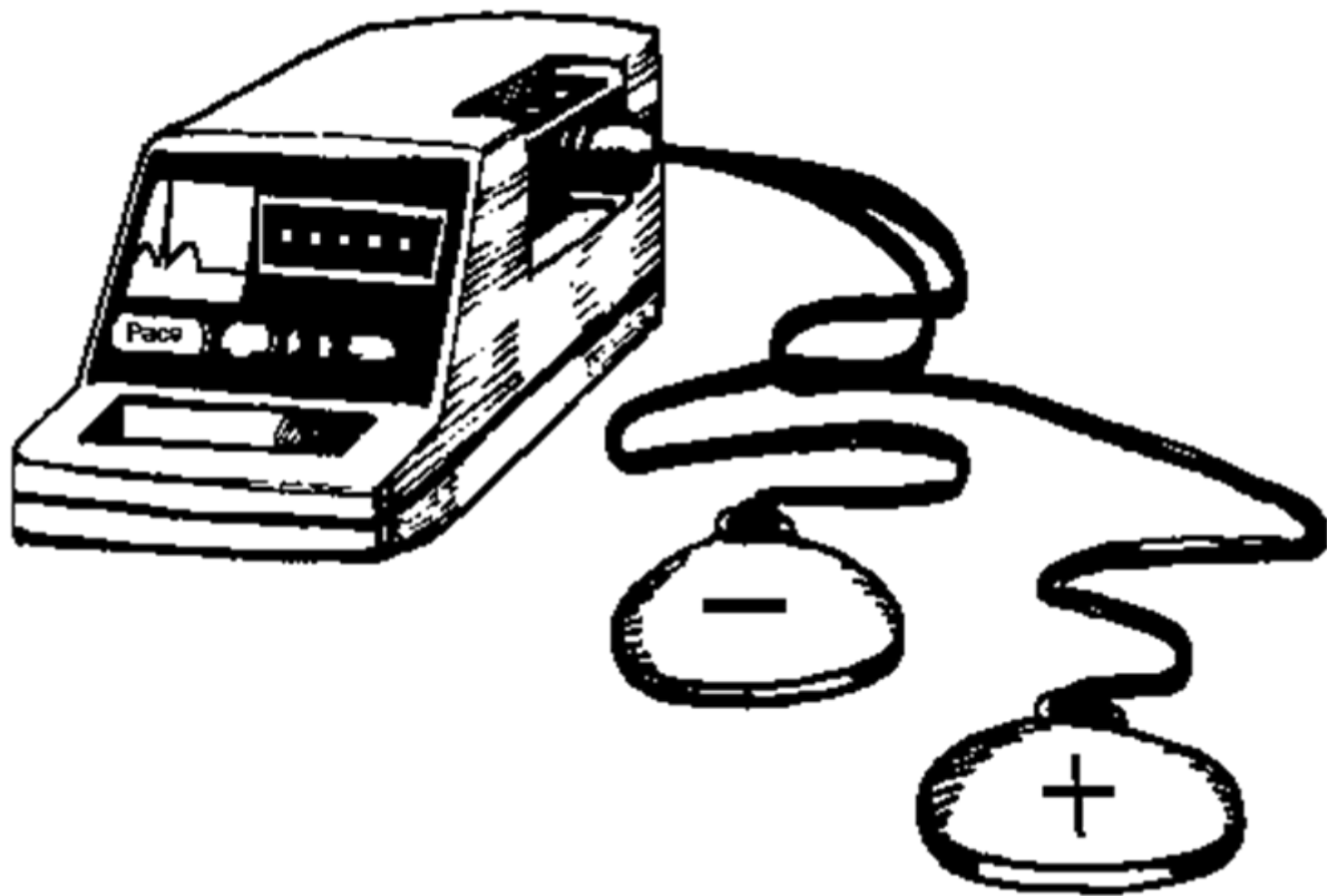
Bradycardia

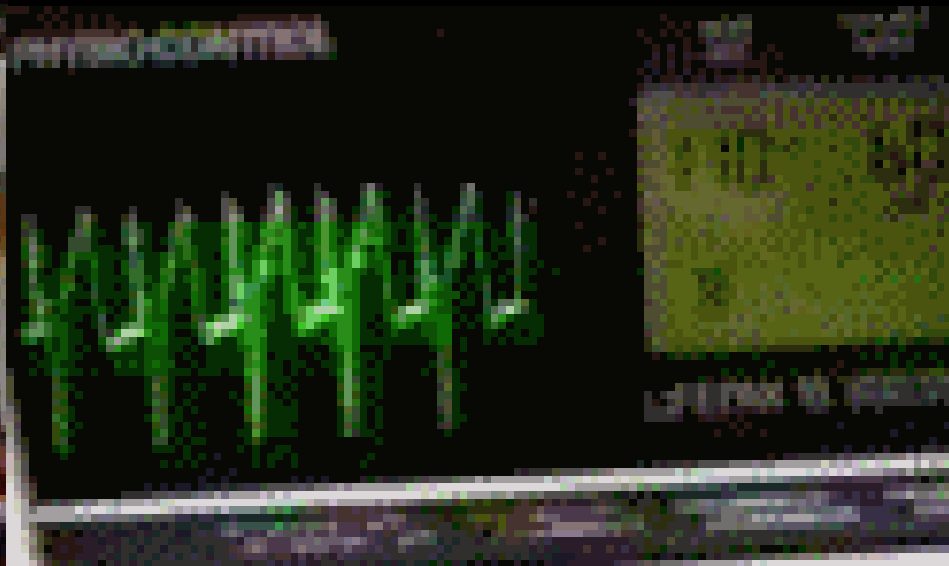




Helpful
Tips


4. Know how to do external
pacing





Limitations of external pacing

- Always question whether cardiac massage or isoprenaline would be better in the short term.
- Only use for bradycardia where there is still a pulse.
- Not recommended for asystole or pulseless rhythms.
- Not as the only back up where you are anticipating a high chance of needing to use a pacemaker.



Helpful
Tips

5. Know how to do
biventricular pacing

Studies indicating a benefit from Temporary postoperative biventricular pacing

- Adult studies

- Thorac cardiovasc surg 2008, Dzemali et al, Frankfurt, 80 adults
- J cardiothorac vasc Anesth 2009, Cannesson et al, adults
- J card Surg 2009 Muehlschlegel et al, Boston, 10 adults

- Congenital heart

- Ann Thorac surg 2003, Zimmerman et al, Chicago, 29 patients (14 single ventricle)
- Ann Thorac Surg 2004, 26 single ventricle patients
- JACC 2005, Sahn et al, Oregon, 19 children with biventricular repair

The effect of biventricular pacing after coronary artery bypass grafting: a prospective randomized trial of different pacing modes in patients with reduced left ventricular function. *J Thorac Cardiovasc Surg* 2009, Eberhardt et al

- 94 patients, mean age 64 years, mean EF 35%
- Randomised to
 - Atrioventricular universal (pacing RV outflow)
 - Biventricular pacing
 - Atrial inhibited
- No difference between the groups in:
 - Diastolic pulmonary arterial pressure,
 - mean arterial pressure,
 - mixed venous saturation,
 - cardiac index,
 - aminoterminal pro-brain natriuretic peptide
 - Median intensive care unit stay (19.5 hours)
 - Incidences of postoperative atrial fibrillation
 - Renal function was unaffected by pacing mode.
- **CONCLUSION:** Despite short-term hemodynamic benefits for patients with reduced left ventricular function, biventricular pacing did not lead to improved postoperative hemodynamics or clinical outcome.

The role of temporary biventricular pacing in the cardiac surgical patient with severely reduced left ventricular systolic function.

Evonich et al, J Thorac Cardiovasc Surg. 2008 Oct;136(4):915-21.

- 40 patients, mean age 66 years, EF <30%, mean QRS 111ms
- Randomised to 'normal' care, A-RV pacing, A-BV pacing
- No difference in clinical outcomes

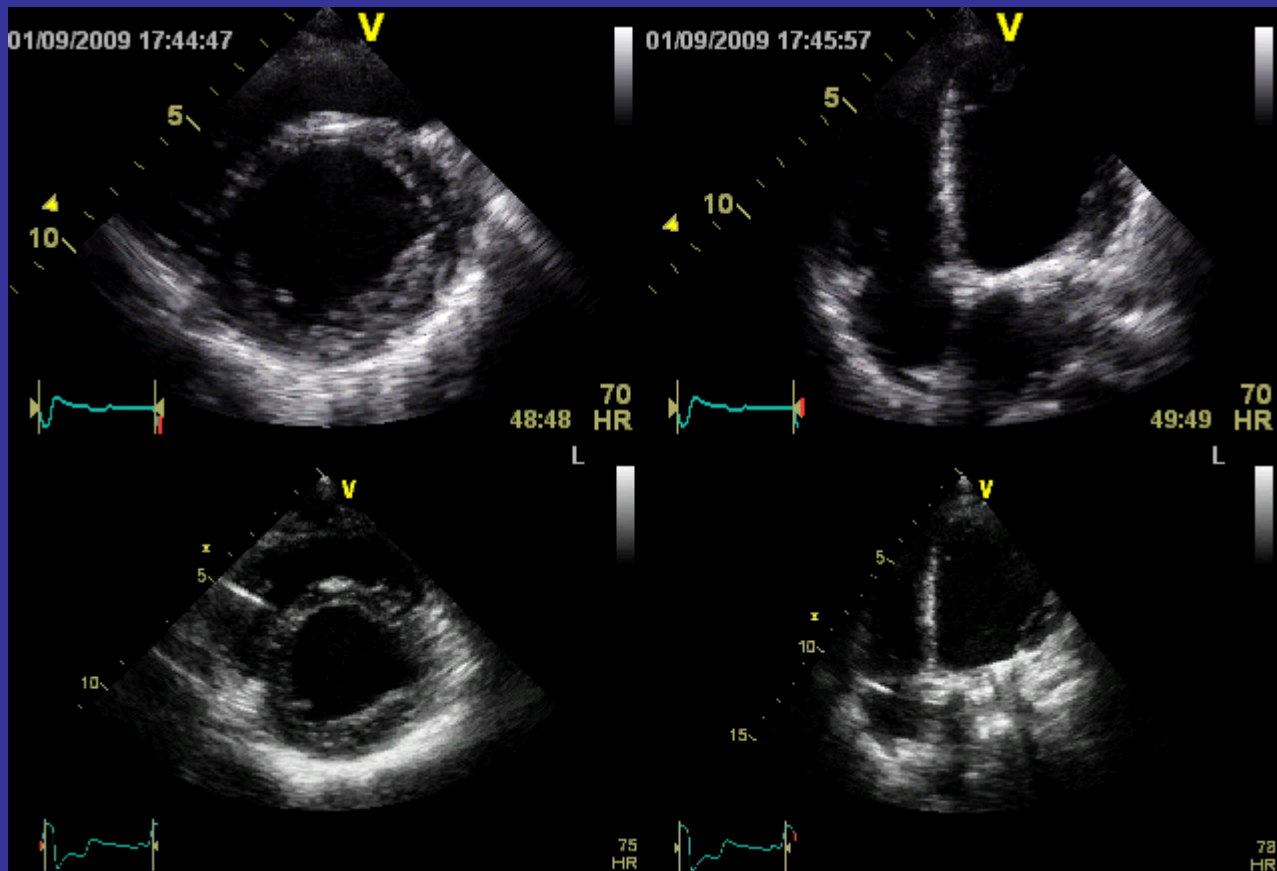
14 year old girl - aortic and mitral valve replacement

- PMH
 - AVR and MVR
 - post op heart block - VVI epicardial pacemaker.
- Dilated LV, poor EF
- Adult criteria for CRT
 - Dilated left ventricle with reduced LVEF
 - wide LBBB (RV pacing)*
 - Dysynchrony on echo
- Postoperative temporary biventricular pacing
(* *NB European Register of paediatric CRT, HEART 2009*)

Post operative progress

Rapid and uneventful post op recovery

- No ECMO or VAD.
- Echo parameters of dyssynchrony and function better post than pre-op
- Permanent Endocardial biventricular pacing system 5 days after surgery
- 1 month later - normal LV size and ejection fraction.




Temporary biventricular pacing post op – WHO?

- Consider if:
 - A) fulfil the adult criteria for implantation of a permanent CRT device,
 - B) Where there are concerns about ventricular function post op and you are anticipating the need for pacing for heart block

Adding another set of ventricular epicardial leads adds little extra time to the overall surgery and carries trivial extra morbidity.





Helpful Tips

1. Stop the meddlers!
2. Get surgeons to place epicardial leads
3. Know how to do oesophageal pacing
4. Know how to do external pacing
5. Know how to do biventricular pacing



NHS 60

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Health and Clinical Excellence*

