

## Paediatric Intensive Care Unit

### MONITORING OF A TEMPORARY CARDIAC PACEMAKER ON PICU

Staff relevant to:	PICU medical & nursing staff.
Team Approval date:	March 2022
Version:	3
Revision due:	March 2025
Written by:	C Westrope
Reviewed by:	C Westrope
Trust Ref:	C98/2016

(See P-drive for a copy of the 'Medtronic 5388 Dual Chamber Temporary Pacemaker' manual)

#### 1. Standards and Procedures

- **set monitor to recognise pacing spikes before testing**
- test for underlying rate & rhythm by pressing & briefly holding the pause key; note any changes in blood pressure when this is done; maximum duration allowed is 10 seconds, but **BEWARE** that shorter times may cause significant haemodynamic compromise in those with absence of a stable underlying rhythm

#### Capture Threshold

- the capture threshold is the stimulus current needed to consistently **PACE** or **'CAPTURE'**
- fibrosis around the epicardial pacemaker wire insertion site can occur & results in an increased threshold
- using a higher than required output is likely to cause fibrosis to occur more quickly
- regular checking of the capture threshold is therefore essential, particularly if critically pacemaker dependant
- the threshold may vary at different AV intervals
- **to check the capture threshold**, pace at least 10bpm above the patients intrinsic rate & gradually reduce the output current until capture ceases - this is the capture threshold
  - test the ventricular threshold - look for pacing spike before QRS complex
  - test the atrial threshold (done in DDD/AAI) - look for pacing spike before p-wave
  - **set output to 3x the threshold**

### **Sensitivity – TEST ONLY IF STABLE UNDERLYING RHYTHM**

- the more sensitive the pacemaker is the easier it responds to/**SENSES** an electrical stimulus
  - sensitivity is ↑ the lower the number set (i.e. it responds to less electricity)
- if *over* sensitive the pacemaker may sense other electrical impulses & believe them to be from the heart, leading to inappropriate inhibition - e.g. extraneous muscle contraction, diaphragmatic contraction or even contraction of the other chamber
- if *under* sensitive the pacemaker will not recognise a true chamber contraction & attempt to pace on top
  - risk of R-on-T phenomenon if ventricular contraction not recognised
- **to check the sensitivity** set pacemaker rate to 10bpm < the intrinsic rate, set sensitivity to a low number (i.e. very sensitive) & set A & V output to 0.1mA (this decreases the risk of competitive pacing)
  - gradually ↓ the sensitivity (↑ the number) until an inappropriate pacing spike appears or the sense indicator stops flashing
    - I.e. not sensitive enough to detect the underlying rhythm
  - test atrial & ventricular sensitivities separately
  - **set the sensitivities to ~ half that measured**
  - a more sensitive setting may be chosen to provide a greater safety margin, but if set too sensitive it could result in inappropriate sensing of other electrical impulses

### **3. Education and Training**

None

### **4. Monitoring Compliance**

None currently identified

### **5. Supporting References**

None

### **6. Key Words**

Pacing, Temporary Pacemaker

---

**The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs. As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.**

<b>CONTACT AND REVIEW DETAILS</b>	
<b>Guideline Lead (Name and Title)</b> C Westrope - Consultant	<b>Executive Lead</b> Chief Nurse
<b>Details of Changes made during review:</b> 2022: No changes to content. Format/review record update only	

Name: \_\_\_\_\_  
 Hosp. No \_\_\_\_\_  
 D.O.B \_\_\_\_\_

**Pacemaker Prescription**

Date	Mode	Rate	Atrial Sensitivity	Atrial Output	Ventricular Sensitivity	Ventricular Output	Other Settings*	Give reason for any changes made	Signature & Name

\*'Other Settings' may include changes to AV interval, atrial tracking or PVARP

**Pacemaker Monitoring** (for details of how to check capture thresholds & sensitivities see over)

- **DO NOT check sensitivity if there is absence of a stable underlying rhythm**
- document any changes made as a result of thresholds/sensitivities measured, on chart above

Date	Spare battery & pacemaker at bedside?*	Underlying Rhythm & Rate	Atrial Capture Threshold	Ventricular Capture Threshold	Atrial Sensitivity	Ventricular Sensitivity	Signature & Name

\*Essential if absence of stable rhythm; also wise to check battery level indicator in upper left of upper pacemaker screen