

Transvenous Pacing Wire Insertion in the ICU / HDU Clinical Guideline

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DOCUMENT PROFILE

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1. INTRODUCTION

This Clinical Guideline is intended as a guide for practitioners for the above named procedure to enable the safe and effective provision of care in a standardised, evidence based approach.

This document should be used in collaboration with the following policies:

Policy title	
	<ul style="list-style-type: none"> • Infection Control policies

2. SCOPE

This guideline is intended for use within the ICU/HDU and relates to adult patients only. Use of this guideline outside of the ICU/HDU is at the professional discretion and responsibility of the individual practitioner. Additional equipment and/or variations to the guideline may be necessary and should be discussed with the attending Doctor and/or Nurse in Charge.

3. DESCRIPTOR

Transvenous pacing is an emergency procedure for the insertion of a temporary pacing system designed for intracardiac pacing. This is a potentially life saving intervention used primarily to correct a profound bradyarrhythmia (Gammage 2000). Transvenous pacing is achieved by threading a pacing electrode through a vein (internal jugular, subclavian or femoral) (McCann 2007) into the right ventricle. The procedure is performed using an image intensifier. Transvenous pacing is a temporary measure until either the patient no longer needs the intervention (drugs overdose) or a permanent treatment option can be instigated (permanent pacing).

It has been demonstrated that insertion of a temporary transvenous pacing wire has a high complication rate and therefore should only be undertaken if the patient is unable to wait for a permanent pacemaker or similar (Betts 2003).

4. INDICATIONS

- Symptomatic heart blocks – type 2 and 3
- Symptomatic bradycardias
- Symptomatic tachycardias (overdrive pacing)

5. CONTRAINDICATIONS

There are no absolute contraindications for transvenous pacing however, increased caution is warranted in the following clinical situations;

- Post thrombolysis

- Deranged clotting
- Increased potential for infection
- Difficulty placing wire – e.g. tricuspid prosthesis

6. PATIENT INFORMATION / CONSENT

The following information should be communicated to the patient prior to transvenous pacing and before consent is gained;

- A full explanation of the procedure
- The indications and contraindications for the procedure
- Potential complications of the procedure
- Answer any questions the patient may have

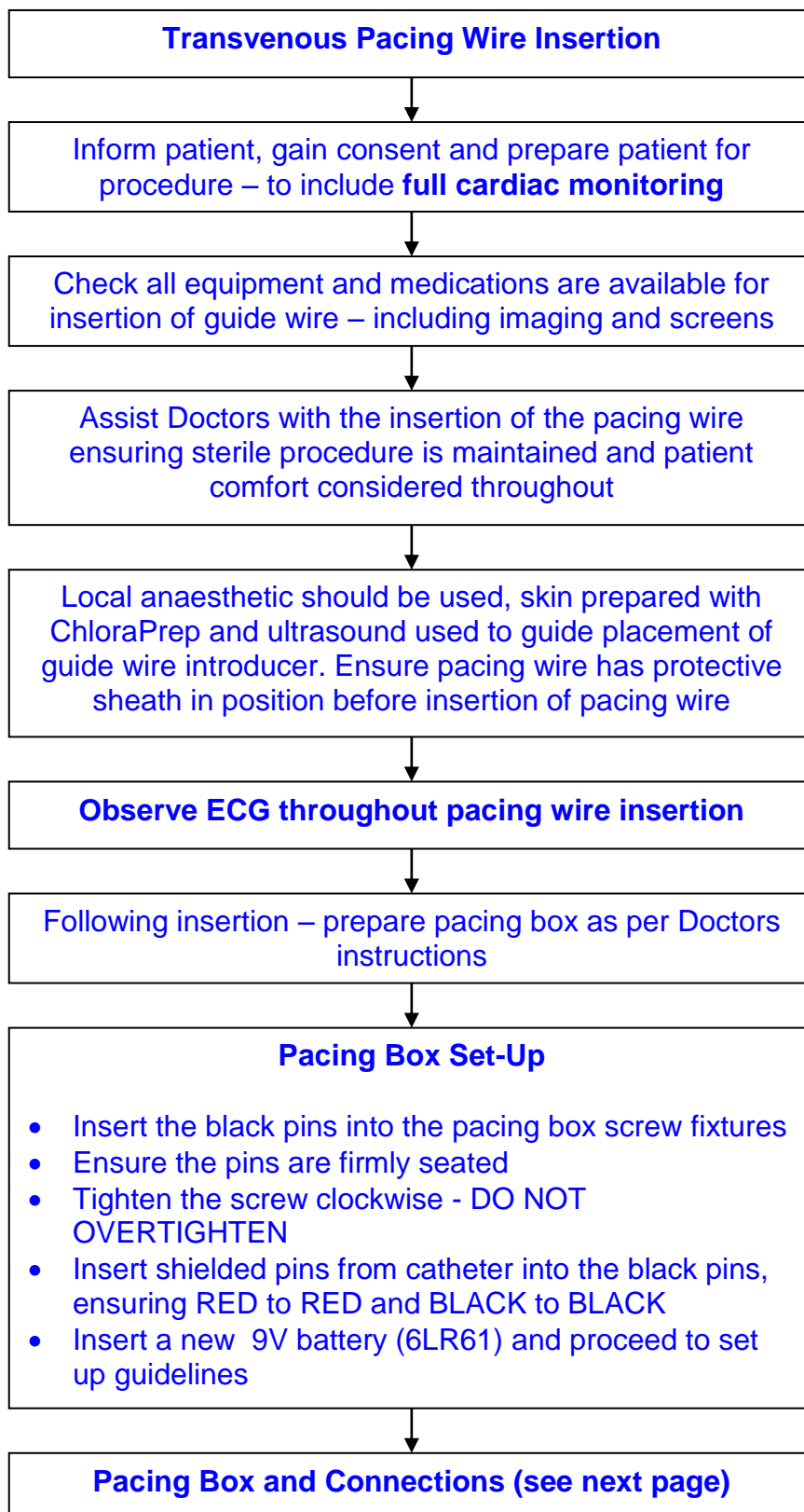
7. EQUIPMENT REQUIRED FOR PROCEDURE

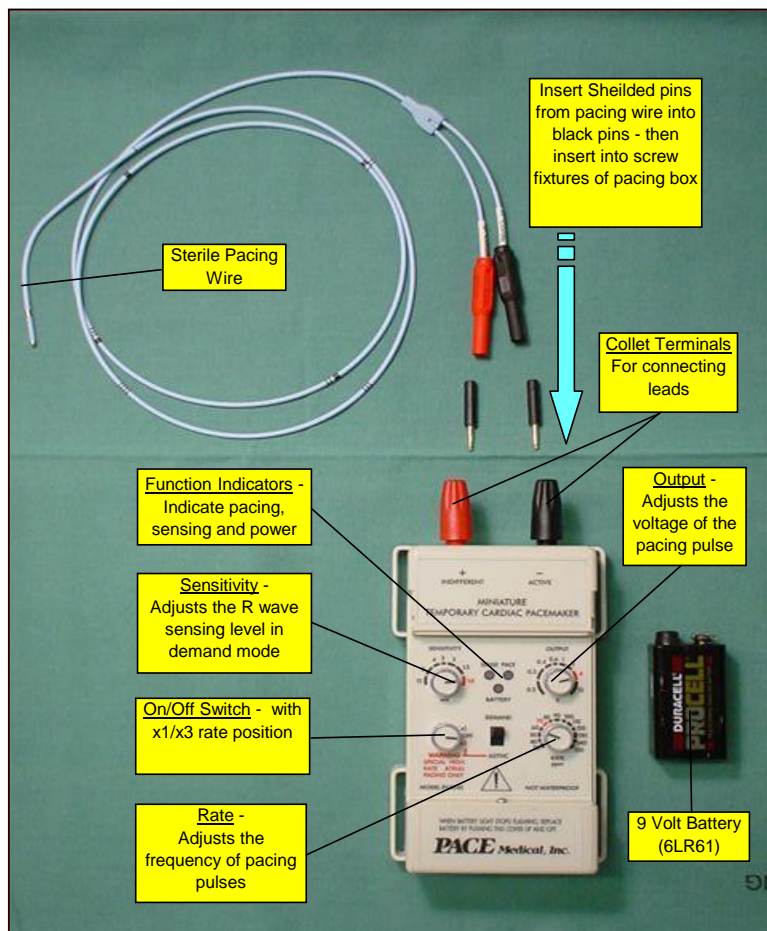
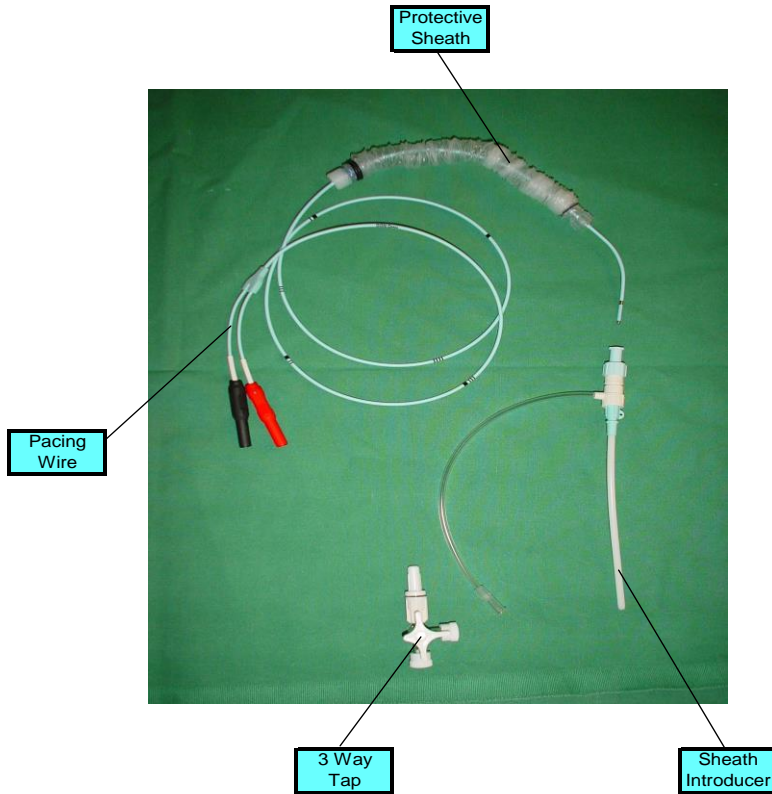
The following equipment will be required for the above named procedure:-

- Pacing trolley/grab box- **trolley located in the corridor in Gwyneth Huelin wing by lift to renal/day surgery.**
- Temporary pacing lead and percutaneous sheath introducer kit
- Pacemaker box and connection cables (including small black and red adaptors)
- Sterile pack
- Sterile gown
- Sterile gloves
- Lignocaine 1 + 2%
- Assorted syringes and blades
- ChloroPrep (3ml applicator)
- Resuscitation trolley and defibrillator
- External pacing pads
- Sonosite – for placement of guide wire
- Image intensifier (**contact radiology**)
- Lead screens (**contact porters**)

8. PROCEDURAL STAGES

The following stages provide detailed descriptors to the above named procedure / investigation.





Pacing Box Set-Up Guideline

- Switch pacemaker off
- Insert small black adapters into the ends of both terminals of the pacing wire
- Connect terminals - Red lead to Red (+ve) Indifferent terminal - (Sensing) Black lead to Black (-ve) Active terminal - (Pacing)
- Push leads into terminals and tighten the caps - DO NOT OVER TIGHTEN
- Set pacing box to demand

Threshold

- Set the output to 3V and pace at a rate above the intrinsic cardiac rate
- Ensure you have capture of the ventricle. If not, check all your lead connections and that the pacing box is properly powered. If still no capture, reposition your electrode and try again
- If capture, slowly turn down the box output watching the ECG monitor
- Identify the point where capture is lost. Note the output and then increase the output again until the ventricle is recaptured. The output where the ventricle is recaptured is the pacing threshold
- Aim for a threshold of <1V. If the threshold is higher then go back and reposition the lead. Sometimes it is necessary to accept borderline thresholds but this should be avoided wherever possible
- Set output to at least 3x the pacing threshold to ensure a good safety margin

Stability

- Test the stability of the lead position by observing lead motion on the X-ray and checking that the ventricle is still captured on the ECG monitor during deep inspiration and coughing. If the lead is not stable then reposition the lead (often just by gently advancing it) and recheck threshold and stability

Fixing

- Once in a satisfactory position, ensure the lead and sheaths are well sutured to the skin to minimize risk of displacement. Apply transparent dressing over the sheath and lead to help fix them in place and maintain sterility
- Secure the external portion of the lead with tape or other fixatives
- Fixing a loop on the skin should mean that inadvertent tugs on the wire will tighten the loop rather than pulling out the wire

Setting the Box

- 'Output' should be set to three the threshold, e.g. 3V
- Set to 'demand' at a rate of, for example, 70bpm
- 'Demand' will mean it does not pace if intrinsic activity is sensed. Asynchronous pacing is therefore avoided and the risk of inducing ventricular arrhythmias reduced. The pacemaker will, on a beat-by-beat basis, 'pace' when it does not detect ventricular activity above that rate and the red 'pace' light will illuminate. When the spontaneous ventricular rate is above the pacemaker rate, the box will inhibit and the red 'sense' light will illuminate
- 'Sensitivity' should be adjusted to ensure that each intrinsic beat is detected but that skeletal muscle interference does not lead to pacemaker inhibition (the lower the setting, the more sensitive the pacemaker)

After Care

- Ensure capture - a QRS complex after every ventricular pacing spike
- Ensure rate is at or above pacemaker set rate
- Ensure sensitivity light flashes every time a QRS complex is sensed
- Ensure pacing wire is firmly secured to patient and that pacing box is secured to patients upper arm
- Ensure pacemaker is kept dry and protect controls from mishandling
- Ensure there are no unsheathed wires showing
- Monitor patient for any complications
- Ensure documentation of procedure is completed including type of pacing wire used the sensitivity and stimulation thresholds, their settings and the rate setting
- Obtain Chest Xray
- Restrict mobility and ensure **daily threshold checks** are performed by medical staff

9. POTENTIAL COMPLICATIONS

Potential complications include (Rajappan and Fox 2003);

- Cardiac dysrhythmias
- Infection
- Localised trauma
- Pnuemothorax
- Cardiac perforation

10. NURSING CARE

Ensure the patient is fully aware of the procedure and has provided consent. The procedure will involve the patient being covered up with sterile drapes and therefore this may be frightening for some. Ensure the patient is provided psychological support. Sedation may be required.

Full aseptic precautions need to be ensured during the insertion of the introducer and pacing wire. Fully assisting the practitioner who is taking responsibility for inserting the wire is imperative. It is also extremely important for the nurse providing assistance to ensure the patient is fully monitored and that this monitoring is observed throughout the procedure as insertion of the wire can cause dysrhythmias.

Following successful insertion of the wire the pacing box will need to be 'set-up' correctly and fixed to the patients arm so that there is a minimal risk of the wire becoming dislodged.

Ensure daily threshold checks are performed by the responsible physician and are recorded in the patient case notes.

11. PATIENT INFORMATION POST-PROCEDURE

It is imperative that the patient undergoing Transvenous Pacing Wire insertion is kept fully informed of the procedure and the ongoing clinical situation. The patient should be made aware of the importance of keeping the Pacing Box securely fixed to their arm and to report any discomfort/pain to nursing staff.

12. DEVELOPMENT AND CONSULTATION PROCESS

Name and Title of Individual	Date Consulted
Andrew Mitchell Consultant cardiologist	April 2018
Samantha North Acting unit manager ICU	April 2018

13. REFERENCES

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