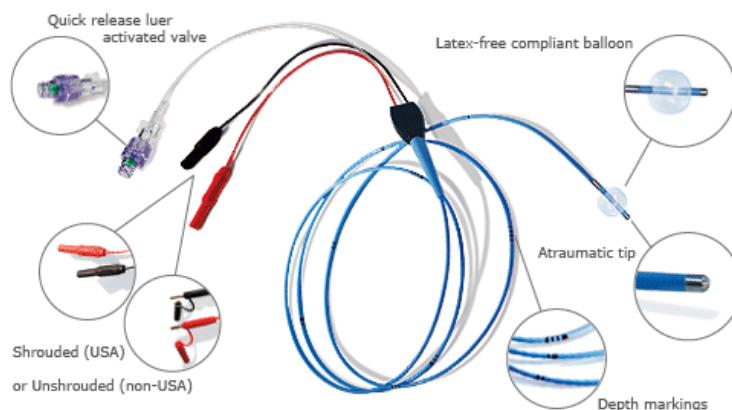


Transvenous Cardiac Pacing



Control dials on the pacemaker

- Sensitivity – ability for the pacemaker to sense Patient's own heart activity
- On/off switch – on is when the dial is turned to X1
- Demand – is always set
- Rate – the rate of the pacemaker to maintain adequate heart rate at about 70 at least
- Output – Volts delivered by pacemaker to capture the heart (paced beat). The output is used to work out the threshold



Indications for Transvenous Pacing

- A definitive indicator for temporary pacing is:
- Bradycardia arrhythmias which compromises the haemodynamic status and is resistant to drug therapy (atropine, isoprenaline, glycopyrronium etc)
- Heart rate less than 40, BP systolic <90mmHg
- Pacing may be started with transcutaneous pacing via defibrillator pacing mode, until temporary pacing wire is inserted and capturing (**capturing means producing paced beat on monitor**)

Transvenous Pacing Equipment & Care

- Wire site entrance is dressed using IV3000 dressing
- Check VIP/ ECG
- Connection to pacing box secure
- Secure box to Patient to prevent detaching
- Pacing wire changed after 7 days
- Spare 9v battery if battery fails
- Clean site entrance per CVC policy aseptically
- Document per shift settings, threshold, output, rate and sensitivity
- ICU Temporary Pacing check list

Transvenous Pacing Complications

- Dislodged wire
- Cardiac Perforation
- Site infection
- Septicaemia
- Tamponade
- Pericardial effusion
- Ongoing cardiac monitoring look for any conduction problems (ectopics, electrolytes “R on T”)
- Loss of capture
- Failure to sense
- Trauma
- Arrhythmias
- Pneumothorax

Transvenous Cardiac Pacing

- **Sensitivity** – ability of the pacemaker to sense the patient's heart activity (QRS complex) Measured in mV
- ON/OFF switch – set on the x1 setting only (see pacemaker box)
- Demand pacing set on pacemaker box.
- **Output** – the volts delivered by the pacemaker to produce a Paced beat
- Rate the rate to maintain adequate heart rate at least 70
- To change 9V battery at back of box
- **The threshold** is the lowest output (smallest number of volts) which will capture the heart
- Threshold ideally should be <1 Volt small percentage of patients may present with threshold above 1 volt, but this can be rare
- Once tested set output to 2-3 times the threshold, for safety.

Transvenous Pacing Checking Threshold

- **This is usually checked by 2 people who are competent in checking threshold.**
One person to watch monitor and one person to reduce output and to work out the threshold
- It is checked on insertion, and then should be checked on a shift basis.
- Explain to Patient prior to checking that they may feel light head or dizzy or feel unwell
- Inform Patient what you are doing
- If Patient's heart rate is above pacing you have to set pacing rate 10 beats above patient's to enable pacing.
- Then turn down output (V) slowly while watching monitor until first beat of pacing is lost, then raise output to return pacing noting the threshold at where pacing was lost. Document threshold. If it has increased doctors should be informed.
- **Connecting pacing wire to box:**
 1. Ensure wires are always securely connected and visible to ensure safety at all time
 2. Distal (printed on wire) –ve attach to black connector on pacemaker box
 3. Proximal +ve attach to red connector on pacemaker box
- **Flashing lights middle of pacemaker** – 3 lights sensing, pacing and battery
 1. Indicates sensing
 2. Pacing mode functioning when flashing
 3. Battery light indicating battery power (keep spare 9 V battery at bedside)

Possible conduction Problems

Loss of capture (loss of pacing beats) is defined as the presence of pacing spikes that are not followed by paced complexes. To troubleshoot loss of capture:

1. Pacing wire not contacting

Check all wires and connections for tightness

2. The battery may be low

Check the indicator and change the battery

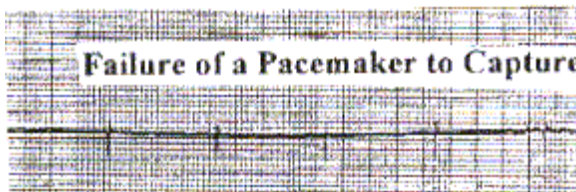
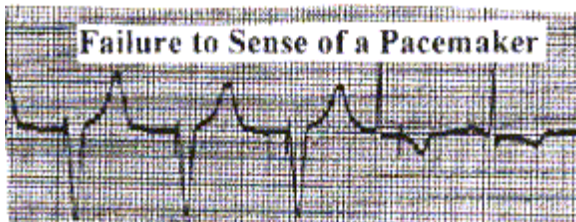
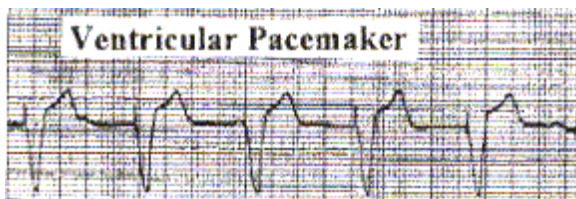
3. Inadequate signal strength

You need to increase the electrical output on the box

Failure to capture

- Turn up output Voltage to capture
- Too high voltage may stimulate the diaphragm clinical sign Patient may develop hiccups. Look at abdomen for signs
- Threshold not capturing may need to reposition the wire. May need to temporary external pace with Defibrillator if capture does not occur when increasing the output. (see failure to capture rhythm strip)
- **Over sensing** – sensitivity too high pacemaker might detect muscle activity and lead to inhibition and may cause asystole. You may need to increase sensitivity setting (this reduces sensitivity) so muscle activity is not detected
- Cardiologist may specify settings for the sensitivity. 1mV
- **Under sensing** – if too low there will be unnecessary stimulation. Pacemaker may deliver at wrong time and cause ‘RonT’ risk of Ventricular fibrillation as a result
- Solution decrease sensitivity setting (this increases sensitivity) so electrical activity is detected

Examples of paced rhythm, failure to sense rhythm and failure to capture rhythm



Remember the pacing form is demand and if the patient's own heart rate is above set parameters on pacing box, the pacemaker will not pace. You will only see the Patient's own rhythm on the cardiac monitor (no pacing spikes). Remember to set pacing mode on bedside monitor.

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