**TITLE:** Temporary Cardiac Pacing - Initiating pacing and/or adjusting settings of the pulse generator (DMF)  
**NUMBER:** CC 10-076

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**THIS IS A DELEGATED MEDICAL FUNCTION FOR REGISTERED NURSES THAT REQUIRES ASSESSMENT OF COMPETENCY PRIOR TO PERFORMING**

Refer to learning module associated with the Post-Entry level competency of Temporary Cardiac Pacing – Assisting a physician with Initiating; and Care/Monitoring of Patients with CC- 10-075

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**Temporary Cardiac Pacing**  
**Initiating pacing and/or**  
**Adjusting settings of the pulse generator**  
(DMF)
**GENERAL**

**POLICY**

1. In the absence of a physician, initiating temporary cardiac pacing and/or adjusting the settings of a pulse generator is a Delegated Medical Function (DMF) to be performed only by Registered nurses who have been deemed competent to perform this skill.
   1.1. Proficiency in the Post-Entry Level Competency *Assisting a Physician with the Initiation/Care and monitoring of Patients with Temporary Cardiac Pacing* is a perquisite to performing this DMF.

2. A physician order is required:
   2.1. For all temporary cardiac pacing.
   2.2. To initiate, adjust or discontinue temporary cardiac pacing.

3. In emergency situations, temporary cardiac pacing is initiated in demand ventricular mode (exception atrial pacing) unless specifically ordered asynchronous by the physician.

4. The physician is notified as soon as the need for temporary cardiac pacing is identified.

5. Stimulation threshold (mA) is to be determined each time temporary pacing is initiated and reassessed minimum of once every 24 hours.

6. mA for epicardial and transvenous pacing should be set 2-3 times above the stimulation threshold and must be reassessed at least once every 24 hours.

7. Patients with temporary pacemakers require continuous cardiac monitoring or telemetry.

8. For Care of a Patient with Temporary Cardiac Pacing, refer to Assisting a Physician with Initiating, and Care and Monitoring of Patients with Temporary cardiac Pacing, CC 10-075

9. Transvenous pacemaker catheters inserted at the bedside require position confirmed by Xray.

**GUIDING PRINCIPLES**

1. Temporary cardiac pacing is to ensure, or restore adequate heart rate and rhythm and may be either a temporary life saving procedure or a therapeutic intervention.

2. Temporary cardiac pacing as initiated by a nurse is a temporary, emergency, life-saving procedure to restore cardiac output. Further medical follow-up is required

3. The physician is notified as soon as the need for temporary cardiac pacing is identified.

4. Pacemaker settings should reflect patient response:
4.1. mA should be sufficient to capture the myocardium and provide adequate heart rate and blood pressure
4.2. Sensitivity should be set to demand to limit incidents of competition (exception, atrial pacing)
4.3. Rate should be set to maintain adequate cardiac output.

5. Refer to manufacturers instructions for operation of unit or site specific temporary pacing equipment.

DEFINITIONS

Please refer to Learning Module for Care of a Pt with a Temporary Cardiac Pacemaker CC 10-075

INITIATING TEMPORARY CARDIAC PACING (Epicardial, Transvenous and Transcutaneous):

POLICY

1. The RN must:
   1.1. recognize pacing ECG morphology
   1.2. be proficient in the Post-Entry Level (Shared) Competency Cardiac Monitoring: Cardiac Rhythm Assessment and Telemetry Monitoring CC 10-013
   1.3. be proficient in the Post-Entry Level (Shared) Competency: Temporary Cardiac Pacing – Assisting a physician with Initiating; and Care/Monitoring of Patients with CC- 10-075
   1.4. be proficient in the Post-Entry Level (Shared) Competency CDHA Non-tunnelled Central Venous Access Catheter (multilumen) CC 80-015(SC) (for Transvenous).
   1.5. Proficient in the Post-Entry Level (Shared) Competency, CDHA, Cordis, SLIC, PICL - Care, Maintenance and Removal of CC 80-030 (for Transvenous and PA Catheter)
   1.6. Proficient in the Post-Entry Level (Shared) Competency, Hemodynamic Monitoring for PA Catheter NC-50-10-100

INITIATING SINGLE CHAMBER (ATRIAL OR VENTRICULAR) EPICARDIAL PACING.

EQUIPMENT

- Alcohol swabs
- #21 gauge needle if needed for ground
- pulse generator with 9V battery
- connecting cables
- wide paper tape
- cardiac monitor
PROCEDURE

Initiating Single Chamber (either atrial or ventricular) Epicardial Pacing

1. Identify cardiac rhythm and confirm need to pace.
2. Identify the method of pacing desired as per physician order.
3. Test battery function in pulse generator & replace battery if necessary.
4. Expose and identify location of wires: atrial wires to right of sternum, ventricular wires to left of sternum.
5. Connect pacing wire to negative (-) terminal of pacing cable and ground lead to positive (+) terminal of pacing cable.
6. Establish ground using un-used ventricular or atrial wire, noting that:
   6.1. ventricular wire should not be used as a ground for atrial pacing
   6.2. if there is only one wire from the patient, that wire is always negative and used for pacing (i.e. not the ground wire).
   Insert the wire into the negative terminal of the connector cable and tighten screw clamp
7. If there is no ground or second RV wire, establish a pacing circuit by using a #21 or smaller gauge needle inserted through a small fold of skin on the upper abdomen. Insert the metal tip of the needle into the positive side of the connector cable opening and tighten the screw clamp.
8. Attach the connection cable to the pulse generator
9. The mA should be sufficient to capture the myocardium and provide adequate heart rate and blood pressure
   9.1. Sensitivity should be set to demand to limit incidents of competition (exception, atrial pacing)
   9.2. Rate should be set to maintain adequate cardiac output.

Determining Stimulation Threshold

1. Set the pacing rate 10 beats above the patients intrinsic rate
2. Gradually decrease the mA from 20 until capture is lost
3. Gradually increase mA until 1:1 capture is established. This is the Stimulation or pacing threshold
4. Set the mA 2-3 times above the stimulation threshold. For example if 1:1 capture is achieved at 3mA, then mA on pulse generator should be set at 6-10mA.

TRANSVENOUS CARDIAC PACING
INTERDISCIPLINARY CLINICAL MANUAL

TEMPORARY CARDIAC PACING CC 10-076

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EQUIPMENT

Refer to Equipment List on Page 352 of AACN Procedure Manual

PROCEDURE

1. Identify cardiac rhythm and confirm need to pace.

2. Verify physician order.

3. Test battery function in pulse generator. Replace battery if necessary.

4. Connect the positive (+) pacing electrode to the positive terminal on the pacing cable and negative (-) pacing electrode to negative terminal of pacing cable and tighten screw clamps.

5. mA should be sufficient to capture the myocardium and provide adequate heart rate and blood pressure. Procedure for checking Stimulation Threshold on page 4

6. Sensitivity should be set to demand to limit incidents of competition (exception, atrial pacing)

7. Rate should be set to maintain adequate cardiac output.

8. Set the Sensitivity dial to "demand" mode. Asynchronous mode should only be used when ordered by a physician. Observe for sense and/or pace illumination on the pulse generator.

9. Establish stimulation threshold or follow physician’s order. Refer to procedure for determining Stimulation Threshold on page 4

TRANSCUTANEOUS CARDIAC PACING

EQUIPMENT

Refer to Page 334 of AACN 5th eds

PROCEDURE

1. Identify cardiac rhythm and confirm need to pace.

2. Plug monitor IN.

3. Select monitor ON.

4. Correct placement of pacing pads is essential for successful pacing. Refer to manufacturer’s instructions and diagrams on pacing pad packaging. Consider:
4.1. Back-Front placement with back (posterior, +) pacing electrode between the spine and left scapula at the level of the heart, and front (anterior, -) pacing electrode at the 4th intercostal space, anterior or mid-axillary line.

4.2. When posterior placement is not possible, the back electrode may be placed over the patient’s right sternal area at the second or third intercostal space and the front electrode is maintained at 4th or 5th intercostal space mid axillary line.

5. Ensure adequate skin contact of pacing pads. Consider:

5.1. Shaving hair from appropriate areas
5.2. Rubbing skin surfaces with alcohol swab, dry gauze, or soap and water to remove oily residue and dead skin cells.

6. Consider patient sedation / analgesia prior to initiating non-invasive pacing.

7. Select Lead II.

8. Adjust ECG size to obtain a visible waveform

9. Ensure there is a secondary cardiac monitor (i.e. separate from pacing device) to facilitate assessment of cardiac rhythm.

10. Connect pacing electrodes to pacing cable from defibrillator.

11. Select Pacer ON.

12. Set pacing rate by turning rate ppm dial to 10 - 20 ppm higher than patient’s intrinsic (own) rate. If no intrinsic rate, set at 70 - 90 ppm.


14. A stimulation threshold of 40-70 mA is required to pace the average-sized adult

15. Gradually increase mA output until capture is achieved, as evidenced by pacer spike occurring before widened QRS.

16. Check to ensure output (pulse) with each paced beat. Monitor vital signs.

17. Set mA output 10% higher than minimum output for capture.

18. Check mA and underlying rhythm at beginning of each shift and prn.

19. Changing electrodes every 24 hours or more often if needed.

20. Monitor skin integrity under electrodes every shift and prn.

21. Advocate for alternative method of pacing. (e.g. Transvenous or permanent pacing)

RELATED CAPITAL HEALTH DOCUMENTS
Post-Entry Level (Shared) Competency: Temporary Cardiac Pacing – Assisting a physician with Initiating; and Care/Monitoring of Patients with CC-10-075

Cardiac Monitoring: Cardiac Rhythm Assessment and Telemetry Monitoring CC 10-013

Post-Entry Level (Shared) Competency, CDHA, Cordis, SLIC, PICL - Care, Maintenance and Removal of CC 80-030 (Transvenous and PA Catheter)

Post-Entry Level (Shared) Competency, Hemodynamic Monitoring (PA Catheter NC-50-10-100)

Post-Entry Level (Shared) Competency CDHA Non-tunneled Central Venous Access Catheter (multilumen) CC 80-015(SC)

REFERENCES


HISTORICAL DATES

Integrated June, 2006; Replaces:
• QEII NC – 10-30-60, Temporary Cardiac Pacing, Epicardial, Transvenous, AV Sequential, PA Catheter,
• QEII NC 10-30-30, Non-Invasive External Pacing
• QEII NC10-30-10, Changing Pulse Generator of a Temporary Pacemaker
• DGH, 1994, Assisting with Insertion of Temporary Pacemakers
• DGH, 1991, Care of Patient with Temporary Pacemaker
• Twin / Oaks/ Birches, 2000, Nursing Responsibilities During External Pacing