7.118 TRANSCUTANEOUS PACING (TCP)
PUBLIC COMMENT JULY 2026

INDICATIONS

- Bradycardia (HR<50 bpm) with a pulse
- Unstable patient with signs of shock including any of the following:
  - Hypotension (SBP <90mmHg)
  - Acute altered mental status
  - Ischemic chest discomfort
  - Acute heart failure
- Bradycardia and hypotension are NOT responsive to trial of atropine and/or epinephrine administration.
- ~~***Adults:*** 2.07 Dysrhythmia: Symptomatic Bradycardia~~
  ~~Persistent bradycardia typically <50 bpm, causing one or more of the following:~~
  ~~Altered mental status • Hypotension (Systolic <90mmHg) • Signs of shock • Chest pain.~~

~~***Pediatric:*** 8.03 Pediatric Dysrhythmia: Bradycardia~~
~~Persistent symptomatic bradycardia, refractory to medications.~~

CONTRAINDICATIONS

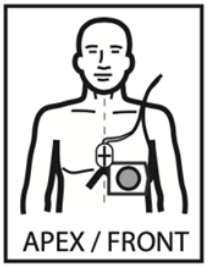
- Pulseless or asymptomatic bradycardia
- Hypothermia ~~(3.06 Cold Injury/Hypothermia)~~
- ~~Asystole or PEA Cardiac Arrest (2.04 Cardiac Arrest).~~

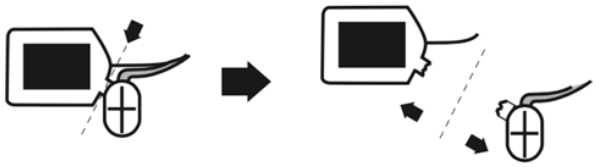
~~**PROCEDURE**~~ **TECHNIQUE**

1. Apply cardiac monitor leads to identify bradycardia that requires transcutaneous pacing (12-lead ECG if available)
2. Strongly consider sedation with **midazolam** prior to procedure
3. Place pads in anterior/posterior lateral position (preferred- See Figure 1) to clean, dry skin
   a. Separate CPR device (puck) from back pad
   b. AVOID pad placement overlying ~~If unable or patient has~~ pre-existing implanted device such as pacemaker or Automatic Implantable Cardioverter-Defibrillator (AICD)~~,~~

Figure 1: Anterior-Posterior Pad placement for Adults and Pediatrics for transcutaneous placing

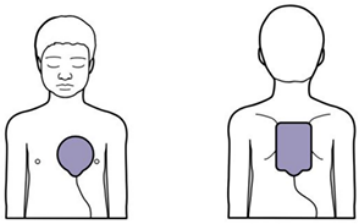
4. Adult CPR Stat Padz Placement in Anterior-Posterior Position





CPR Device = puck

Pediatric OneStep Electrodes With Green Connector Placement



5. Attach pacing cables to pads
6. Assure safe environment- evaluate risk of sparks, combustibles, oxygen-enriched environments
7. Select "PACER" mode on monitor
8. Select rate and increase to 80 beats per minute (adults) and 100 beats per minute (pediatrics)
9. Select current and increase to 50mA
10. Gradually increase delivered current until electrical capture is achieved. The average current needed for capture is between 50-100mA
11. Electrical capture is determined by downward blue spacer spikes with a P and the presence of a widened QRDS, the loss of any underlying intrinsic rhythm, and the appearance of an extended and sometimes enlarged, t-wave (see Figure 2).
12. Palpate the patient's pulse to assess for mechanical capture
13. Reassess patient condition
14. If pulseless, discontinue patient and initiate **Medical Arrest** protocol

~~15. Place pads in anterior/posterior position, if unable to place pad posteriorly can place in anterior/lateral position. Do not place pads over pre-existing implanted devices such as pacemakers or AICDs.~~

~~a. ***Pediatrics:*** Continue CPR if <60 bpm and signs of poor perfusion throughout procedure until mechanical capture is achieved~~

~~16. Switch to pacing mode.~~

~~17. Adjust pacing rate to:~~

~~a. *Adults (>12 yo):* 60-80bpm (ideally >30 bpm above patient's initial rate).~~

~~b. ***Pediatrics (<12 yo):*** 100 bpm.~~

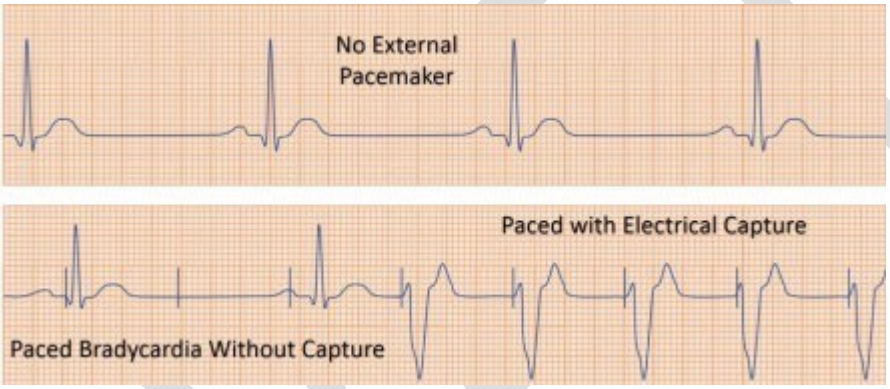
~~**18.** Set initial current to zero mA, increasing mA until pacing is captured on monitor (Max 120mA).~~

~~a. If patient is unconscious increase by 20mA intervals, if conscious increase by 10mA intervals.~~

~~b. Electrical capture can be identified on monitor when every pacer spike is followed by a wide QRS morphology with peaked T waves (see example below under "Paced with Electrical Capture").~~

Figure 2: Example of electrical capture on external pacemaker

San Francisco EMS agency
Effective10/01/24
Supersedes: New



DOCUMENTATION

1. EMS Personnel responsible for procedure
2. Initial and serial vital signs
3. Patient reassessment post-procedure
4. Complications, if applicable

CONSIDERATIONS

- TCP is safe to perform in pregnant patients
- Assessment of carotid pulse is not recommended as pacing can cause muscle contractions difficult to distinguish from pulse

19. Ensure mechanical capture by palpating a femoral pulse with every QRS capture If unable to quickly access femoral pulse a right radial pulse can be utilized until femoral pulse accessed.

20. If electrical/mechanical capture not achieved at 120 mA, change vector of pads and repeat above steps.

a. ***Pediatrics:*** If unable to achieve electrical/mechanical capture continue CPR if <60 bpm and signs of poor perfusion.

21. Once both electrical and mechanical capture obtained, increase by 5-10mA.

22. Once appropriate current obtained for capture, slowly increase heart rate (*Adults:* max 100 bpm) if necessary to relieve patient's symptoms from bradycardia.

a. ***Pediatrics***: please refer to length-based resuscitation tape for target heart rate and systolic blood pressure goals for age (14.IV.Normal Pediatric Vital Signs)

23. Consider sedation/pain management for all patients undergoing pacing Midazolam(Sedation);

a. ***Pediatrics***: please refer to length-based resuscitation tape for systolic blood pressure goals for age (14.IV.Normal Pediatric Vital Signs)

- CPR is safe during TCP and should be performed in pediatric population until mechanical capture is achieved
- TCP should not be delayed for IV access, 12-lead ECG, or while waiting for atropine to take effect in an unstable patient.

A. Electrical capture can happen without mechanical capture. Electrical capture can be assessed on monitor with identification of QRS complex after every pacer spike. Mechanical capture is evaluated with palpation of a femoral pulse with every QRS complex.