

# Southern Illinois Regional EMS System

## II-27 APPLICATION OF EXTERNAL PACEMAKER

1. Policy:
  - 1.1. To establish guidelines for the application prehospital of an external pacemaker in the adult patient (18 years of age or older) who presents with bradysystolic cardiopulmonary arrest or Atropine refractory symptomatic bradycardia.
2. Equipment needed:
  - 2.1. Gloves.
  - 2.2. Pacemaker unit:
    - 2.2.1. This procedure describes use of the “Quick-Pace” electrodes.
  - 2.3. ECG monitor.
3. Procedure:
  - 3.1. Put on gloves.
  - 3.2. Assess patient for instability:
    - 3.2.1. Systolic BP of 90 or below and heart rate of 550 or below with:
      - 3.2.1.1. Decreased level of consciousness due to bradycardia.
      - 3.2.1.2. Chest pain of suspected myocardial origin.
    - 3.2.2. Bradysystolic cardiopulmonary arrest.
  - 3.3. Apply pacemaker:
    - 3.3.1. Anterior-Posterior placement is preferred:
      - 3.3.1.1. Place negative electrode on left anterior chest halfway between the xiphoid process and the left nipple with the upper edge of the electrode below the nipple line.
      - 3.3.1.2. Place the positive electrode on the left posterior chest beneath the scapula and lateral to the spine.
    - 3.3.2. Anterior-Anterior placement:
      - 3.3.2.1. Place negative electrode on left chest mid-axillary over fourth intercostal space.
      - 3.3.2.2. Place positive electrode on anterior right chest inferior to clavicle.
      - 3.3.2.3. This position should only be used if A-P positioning is not possible.
4. Pacing Procedure:
  - 4.1. Attach ECG monitor to patient:
    - 4.1.1. Patient must remain monitored during entire pacing procedure.
  - 4.2. Connect pacing cable to ECG monitor.
  - 4.3. Connect Quick-Pace electrodes to pacing cable matching electrode color to connector color.
  - 4.4. Position pacing electrodes as above.
  - 4.5. Push “Pacer” button.
  - 4.6. Increase pacing rate to 60 beats per minute (pacer powers up at 40 bpm).
  - 4.7. Observe monitor:
    - 4.7.1. “Sense marker” (ˆ) should appear on each QRS or QRS complex.
    - 4.7.2. If sense marker is not present on QRS or appears elsewhere:
      - 4.7.2.1. Adjust ECG size control for optimal sensing.
        - 4.7.2.1.1. If this fails, select another lead and readjust ECG size.

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- 4.7.2.2. If ECG size is adjusted too low, pacer will not be able to operate in a synchronous mode and ECG will be difficult to assess.
- 4.7.2.3. If ECG size is adjusted too high, ECG artifact may inhibit pacing appropriately.
- 4.8. Activate pacemaker by pushing the “start/Stop” button.
  - 4.8.1. The indicator will flash and a positive pacing spike will be seen with each paced beat.
- 4.9. Slowly increase current (mA).
  - 4.9.1. Watch monitor for electrical capture of pacing stimulus.
  - 4.9.2. Assess pulse and BP for evidence of mechanical capture.
- 4.10. The recorder will document the selected pacing parameters.
  - 4.10.1. Each pacing stimulus will be marked with an arrow on the lower edge of the ECG paper.
- 4.11. If the intrinsic heart rate exceeds the pacing heart rate:
  - 4.11.1. The pacemaker will sense the cardiac activity and not discharge.
- 4.12. Musculoskeletal contractions may be observed while pacing.
  - 4.12.1. This may be somewhat uncomfortable for some conscious patients.
  - 4.12.2. Discomfort may be minimized by using the lowest current which produces capture and by varying the position of the pacing electrodes.
    - 4.12.2.1. If using the A-P approach, moving the anterior pacing electrode to the v6 (4th ICS MAL) ECG electrode may result in a lower capture threshold thus reducing discomfort.
    - 4.12.2.2. In some cases, sedation may be needed.
- 5. Documentation:
  - 5.1. Who performed procedure?
  - 5.2. PPE and equipment used.
  - 5.3. Which placement used.
  - 5.4. Rhythm strips before and after application of pacemaker.
  - 5.5. Any side effects.
  - 5.6. Time of application.