



Procedure 705: Transcutaneous Cardiac Pacing

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❖ Definition

- Transcutaneous pacing (TCP) is a technique of electronic cardiac pacing accomplished by using skin electrodes to pass repetitive electrical impulses through the thorax.

❖ Indications

- TCP should be considered in pediatric and adult patients with symptomatic bradycardia, no matter the etiology. In general, symptomatic bradycardia is defined as a patient with a heart rate of less than 60 bpm with significant hypotension/signs of shock.
- Consider causes and correct if possible, prior to TCP
 - hypoxia (especially in children) trauma
 - drug overdose
 - electrolyte imbalances
 - hypothermia
- Pediatric TCP
 - Indicated for profound symptomatic bradycardia refractory to BLS and ALS interventions
 - Base Station order unless the child is in extremis.
 - Use pediatric pacing electrodes for children less than 15 kg.
 - Contraindications
 - Asystole or brady-asystolic arrest
 - Non-intact skin at the electrode site
 - Patients with signs of serious blunt or penetrating trauma

❖ Procedure

- Explain procedure to patient
- Establish IV/IO access if possible. Do not delay TCP in grossly unstable patients.
- Consider Sedation. Sedation is optional
- Adults:
 - **Midazolam** 1-2.5 mg IV/IO, or 2.5-5 mg IM.
 - May be repeated to a total of 5 mg IV/IO, 10 mg IM.
 - **Morphine Sulfate**: 2-5 mg IV/IO, or 10 mg IM.
 - **Morphine Sulfate** reserved when **Midazolam** is inadequate.
 - Monitor the patient carefully for worsened hypotension and hypoxia.
- Pediatrics:
 - **Midazolam**: 0.1 mg/kg IV/IO to a maximum of 2 mg total, or 0.2 mg/kg IM to a maximum of 3 mg total.
 - **Morphine Sulfate**: 0.1 mg IV/IO/IM to a maximum of 5 mg.
 - **Morphine Sulfate** reserved when **Midazolam** is inadequate.
 - Monitor the patient carefully for worsened hypotension and hypoxia.



- Place monitoring and pacing electrodes.
- Anterior/posterior pacing electrode placement is preferred, though anterior/lateral placement is also acceptable.
- Verify that the pacing and monitoring electrodes are adequately spaced from one another to prevent ECG interference.
- Settings
 - Set heart rate to 80 bpm.
 - Demand pacing mode.
 - Begin output current at 0 milliamps (mA).
 - Increase output in 10 mA increments until electrical capture is noted.
 - Confirm that mechanical capture (pulses) has also been achieved.
 - Assessment of capture should show pacer spikes that are followed by QRS complexes, with corresponding pulses.
 - If capture is maintained but the patient remains symptomatic (BP of less than 90 systolic, poor skin signs, delayed capillary refill, weak pulses, ALOC), consider increasing the rate in 10 bpm increments until 100 bpm is achieved.
- If patient comfort is maintained, continue pacing.
- If the patient is uncomfortable,
 - consider sedation.
 - reduce current output in 5 mA increments to a point just above electrical and mechanical capture.
- If perfusion remains problematic, make base station contact to discuss an order for Push-dose **Epinephrine** with the base station. See Procedure 708 *Push-Dose **Epinephrine** Mixing Instructions*
- If the patient remains unconscious during pacing, monitor vital signs carefully.
- In cases where electrical capture is achieved with no palpable pulses, consider following Protocols 700-C1 or 700-C1-P, *Cardiac Arrest*.
- ❖ A paper copy of the ECG obtained during this procedure should be delivered to the receiving hospital and should be attached to the patient's PCR.