

Electrical Therapy

Purpose: To provide a procedure for the performance of appropriate electrical therapy

Automatic External Defibrillation (AED)

Refer to the Automatic External Defibrillator (AED) procedure.

Manual Defibrillation

1. Indications:
 - A. Ventricular fibrillation
 - B. Pulseless ventricular tachycardia

Pre-Medical Control

PARAMEDIC

2. Technique:
 - A. Turn defibrillator on.
 - B. Apply defibrillator paddles/pads according to manufacturer specifications.
 - C. Charge defibrillator to energy level specified in appropriate protocol or according to manufacturer specifications.
 - D. Verify shockable rhythm.
 - E. Assure that no one is touching the patient.
 - F. Defibrillate patient.
 - G. Immediately initiate or resume CPR.
 - H. Repeat defibrillations at 2 minute intervals if the patient remains in a shockable rhythm per protocol.
 - I. Continue to treat the patient according to the appropriate protocol.
3. Precautions
 - A. Dry the chest-wall if wet or diaphoretic.
 - B. Nitroglycerin paste should be removed; paddles should not be placed over nitroglycerin patches.
 - C. Avoid placing the paddles over a pacemaker or AICD.
 - D. If visible muscle contraction of the patient did not occur, defibrillation did not occur; check equipment.
 - E. If pediatric pads were used with an AED prior to ALS management,
 - a. Either use the AED with their pediatric pads or
 - b. Remove the pediatric AED pads and use non-attenuated pediatric pads for defibrillation.
4. Complications
 - A. Accidental shock of adjacent individual
 - B. Skin burns resulting from inadequate contact between paddles and skin or due to inadequate conducting gel or dry conductive pads.

Synchronized Cardioversion

1. Indications: Hemodynamically unstable patient with the following rhythms:
 - A. Wide Complex Tachycardia (Presumed Ventricular Tachycardia).

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B. Narrow Complex Tachycardia (Supraventricular Tachycardia (SVT), or Atrial Fibrillation.

2. Contraindications: Heart rate < 150 unless ordered by medical control

Pre-Medical Control

PARAMEDIC

3. Technique:

- A. Consider IV sedation per **Patient Sedation Procedure**.
- B. Turn on defibrillator (monophasic or biphasic)
- C. Attach monitor leads to the patient and ensure proper display of the patient's rhythm.
- D. Turn SYNC on, assure that QRS complex is marked
- E. Apply defibrillator paddles/pads according to manufacturer specifications.
- F. Charge defibrillator to energy level specified in appropriate protocol or according to manufacturer specifications.
- G. Check Rhythm.
- H. Assure that no one is touching the patient
- I. Cardiovert patient
- J. Recheck pulse and rhythm
- K. If rhythm does not convert, repeat cardioversion according to the appropriate protocol.
- L. Recheck the "sync mode" after each synchronized cardioversion as many defibrillators default back to unsynchronized mode.
- M. If ventricular fibrillation occurs, deactivate synchronized mode and defibrillate.

4. Precautions

- A. Same as for defibrillation
- B. In "sync" mode, the button(s) need to be held until a shock is delivered. If a shock is not delivered the first time, hold the buttons again.
- C. If a sinus rhythm is achieved by cardioversion, even briefly, and then reverts to previous rhythm, repeat the cardioversion at the same setting as was initially successful.

5. Complications

- A. Accidental shock of adjacent individual
- B. Skin burns resulting from inadequate contact between paddles and skin or due to inadequate conducting gel or dry conductive pads.

Transcutaneous Pacing (TCP)

1. Indications: Symptomatic Bradycardia with inadequate perfusion.

Pre-Medical Control

PARAMEDIC

2. Technique:

- A. Monitor rhythm.
- B. ECG electrodes must be in place, along with pacing pads or combo-pads, in order for the pacer to function.
- C. Apply pacing electrodes per manufacturer's instructions.
- D. Consider sedation, per **Patient Sedation Procedure**.

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- E. If QRS complexes are present, select a lead in which the QRS is the most positive or upright (so machine can sense their presence).
 - F. Set external pacemaker rate to 60 bpm to begin.
 - G. Initiate pacing and increase MA output until evidence of capture has occurred
 - H. Increase at increments of 20 MA for unconscious patients and 5 MA for conscious patients.
 - a. Use minimal MA needed for mechanical capture.
 - I. Run an rhtyhm strip and save.
 - J. Assure adequate electrical and mechanical capture.
 - a. Electrical:
 - 1. Visible pacer spike immediately followed by wide QRS and broad T waves.
 - b. Mechanical:
 - 1. Palpable Pulses, improved LOC; improved BP; improved patient color
 - K. If mechanical capture is not obtained, contact medical control. Perform CPR if appropriate.
3. Precautions
- A. Use of transcutaneous pacemakers can cause painful muscle contractions. Consider the use of sedation in patients that are awake. See **Patient Sedation Procedure**
4. Contraindications
- A. Wet environment
 - B. Burns to the chest (relative)

Special Considerations for Electrical Therapy:

- 1. Electrical therapy may not be successful in hypothermic patients; refer to **Hypothermia Cardiac Arrest Protocol**.