



EMS System for Metropolitan Oklahoma City and Tulsa 2026 Medical Control Board Treatment Protocols



DRAFT for Approved 3/4/26, Effective 4/1/26, replaces all prior versions

5E – TRANSCUTANEOUS PACING ADULT & PEDIATRIC

PARAMEDIC

Indications:

1. Symptomatic 2nd Degree AV Block-Type II (Classic)
2. Symptomatic 3rd Degree AV Block (Complete)
3. Symptomatic Bradycardia in Acute Coronary Syndrome in preference to atropine use
4. Symptomatic Bradycardia unresponsive to non-electrical interventions
5. Symptomatic Bradycardia in pediatric patients (when approved by OLMCP consultation)

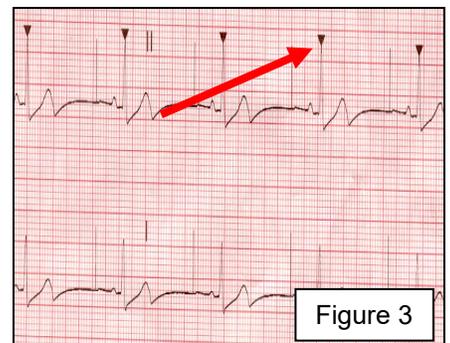
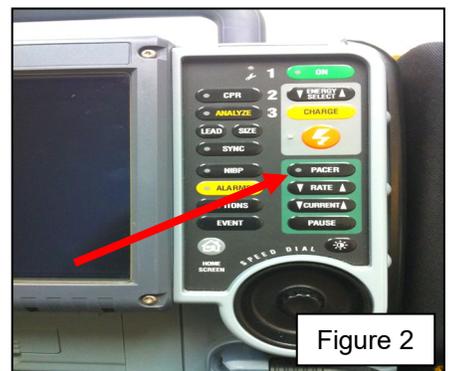
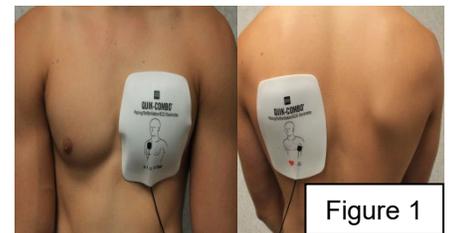
Contraindications:

1. Asymptomatic Bradycardia

Technique:

(Stryker LifePak® 15):

1. Maintain standard ECG monitoring using electrodes/cable.
2. Apply Quik-Combo™ pads in anterior/posterior chest wall location illustrated in (Figure 1). Excessive diaphoresis may require drying and/or excessive chest hair may require partial removal to achieve appropriate pad-chest wall adhesion.
3. Connect Quik-Combo™ pad set to LifePak® monitor/defibrillator via attached cable.
4. Advise patient of impending therapy. Administer sedation if patient condition allows, adults to receive 2-5 mg midazolam IVP as individual patient weight and hemodynamics dictate.
5. Power on the pacing function by pressing the "PACER" button (Figure 2).
6. Confirm ECG rhythm is sensed by Quik-Combo™ pads, looking for triangular "sense markers" marking QRS complexes (Figure 3). If sense markers do not appear, check for correct Quik-Combo™ pad attachment to LifePak monitor/defibrillator. If sense markers are inconsistently tracking QRS complexes and/or tracking T waves, adjust ECG size or select alternate monitoring lead to achieve correct QRS complex tracking.





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PROTOCOL 5E: Transcutaneous Pacing, Adult & Pediatric, cont.

Technique (cont):

7. Set pacing **rate** at 60 paces per minute (adults) either by pressing the "RATE" switch up arrow to increase rate or down arrow to decrease rate or by rotating the "SPEED DIAL" knob (Figure 4). The "RATE" switch will allow changes in 10 paces per minute increments; the "SPEED DIAL" knob will allow changes in 5 paces per minute increments.
8. Set pacing **current** at minimum level achieving electrical AND mechanical capture. Deliver electrical pacing current either by pressing the "CURRENT" switch up arrow to increase milliAmp (mA) current or down arrow to decrease mA current or by rotating the "SPEED DIAL" knob (Figure 5). The "CURRENT" switch will allow changes in 10 mA increments; the "SPEED DIAL" knob will allow changes in 5 mA increments.
9. Pressing the "PAUSE" button will cause the set pacing rate to decrease by 25% (eg. rate of 60 paces per minute changes to rate of 45 paces per minute) while it is being depressed. This function should not be used without directive from OLMC.
10. If pacing therapy termination is required, power off the pacing function by pressing the "PACER" button (Figure 2).

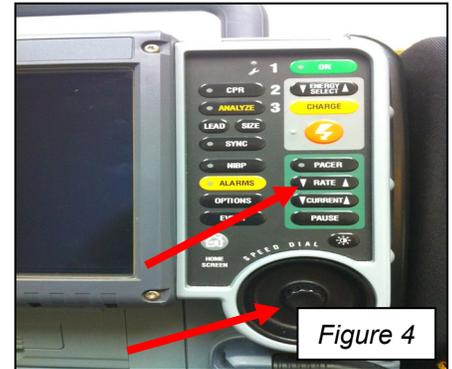


Figure 4

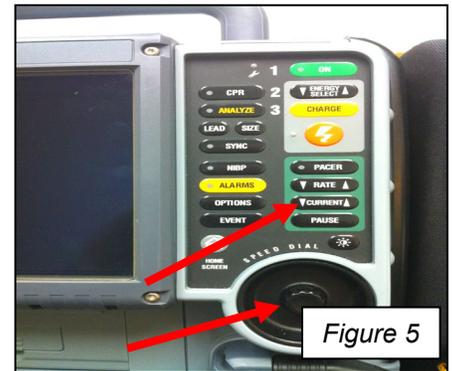


Figure 5

Pacing-Related Considerations: (Stryker LifePak® 15):

1. In the event of ventricular fibrillation or pulseless ventricular tachycardia, pressing the yellow "CHARGE" button will automatically stop the pacing function. Proceed with defibrillation.
2. If the monitor displays "**ECG LEAD OFF**" during transcutaneous pacing, pacing automatically switches to non – demand and continues at the fixed programmed rate independent of the patients intrinsic underlying rate until the ECG lead(s) is reattached. The monitor continues to display the pacing rate and the current. To reestablish demand pacing, reattach the ECG lead(s).
3. If the Quik-Combo™ electrodes detach during pacing, the monitor will display "**CONNECT ELECTRODES**" and "**PACING STOPPED**" messages and sound an alarm. The set pacing rate is maintained, but the current resets to 0 mA. Reattaching the Quik-Combo™ electrodes silences the alarm and removes the messages. The current remains at 0 mA until manually adjusted as described above.



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Pacing-Related Considerations (cont):

4. Proper electrical capture is displayed by depolarization of the ventricles, reflected as a wide QRS, followed by a distinct, broad T wave (Figures 6 & 7). Absence of these findings immediately following pacing spikes generally indicates failure of consistent electrical and mechanical capture (Figures 8 & 9).
5. With transcutaneous pacing, it may be difficult to see the paced QRS complex due to washout from the pacing stimulus. It is imperative to confirm capture by a physiologic measure such as a pulse.



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Technique:

(Stryker LifePak® 35):

1. Maintain standard ECG monitoring using electrodes/cable.
2. If Transcutaneous Pacing is indicated, connect the therapy electrodes (defibrillation pads) to the therapy cable and confirm cable connection to the monitor/defibrillator. (Figure 1). Apply Quik-Combo™ pads in anterior/posterior chest wall location illustrated in (Figure 2). Excessive diaphoresis may require drying and/or excessive chest hair may require partial removal to achieve appropriate pad-chest wall adhesion.
3. Advise patient of impending therapy. Administer sedation if patient condition allows, adults to receive 2-5 mg midazolam IVP as individual patient weight and hemodynamics dictate.
4. Use the touch screen to select **THERAPY** on the lower right hand corner on the screen. (Figure 3)
5. Select **PACING** on the **THERAPY** menu, located on the right side of the screen. The **PACING** box will be shaded yellow when **PACING** mode is selected and active and the pacing controls will appear. (Figure 4)
6. Observe the ECG rhythm. Confirm that the triangle sense marker (▼) appears near the MIDDLE of each QRS complex.
 - a. The triangle sense markers will automatically appear in the top ECG channel (Figure 5)
 - b. If sense markers **DO NOT** appear, check for correct Quik-Combo™ pad attachment to LifePak monitor/defibrillator. If sense markers are inconsistently tracking QRS complexes and/or tracking T waves, adjust **ECG SIZE** or select another lead to achieve correct QRS complex tracking.
 - c. If care providers need support, abbreviated instructions are available by pressing the **BLUE Circle** with a question mark icon in the **THERAPY** box on the left hand side of the screen.

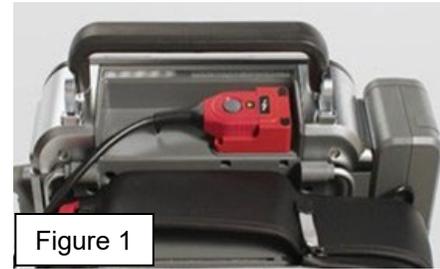


Figure 1

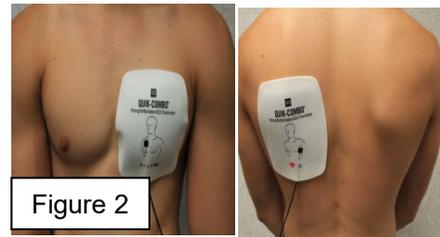


Figure 2



Figure 3



Figure 4



Figure 5



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7. Utilize the touch screen to set the pacing **RATE** by pressing **RATE UP/DOWN ARROWS**, **ENERGY DIAL**, or rotate the physical **SPEED DIAL**. Set the pacing **RATE** at 60 paces per minute (adults) (Figure 6). The **RATE UP/DOWN ARROWS**, **ENERGY DIAL**, and physical **SPEED DIAL** knob will allow changes in 5 paces per minute increments.
 - **NOTE:** When utilizing the physical **SPEED DIAL** knob, scroll to the option desired (i.e. **RATE**), and depress down on the **SPEED DIAL** knob to select that option; the respective desired option energy dial will be highlighted yellow (Figure 6). Scroll the **SPEED DIAL** knob to select desired **RATE**. Depress the **SPEED DIAL** knob once more to confirm selection.
8. Utilize the touch screen to set the pacing **CURRENT** by pressing **CURRENT UP/DOWN ARROWS**, **ENERGY DIAL**, or rotate the physical **SPEED DIAL**. The **CURRENT UP/DOWN ARROWS**, **ENERGY DIAL**, and physical **SPEED DIAL** knob will allow changes in 5 milliamp (mA) increments.
 - a. Increase pacing **CURRENT** until electrical AND mechanical capture occurs.
 - b. Assess the patient's physiologic response to program pacing output. Palpate the patients pulse, check blood pressure, SPO2 pleth waveform, and ETCO2 values to confirm mechanical capture.

NOTE: When utilizing the physical **SPEED DIAL** knob, scroll to the option desired (i.e. **CURRENT**), and depress down on the **SPEED DIAL** knob to select that option; the respective desired option energy dial will be highlighted yellow (Figure 6). Scroll the **SPEED DIAL** to select desired **CURRENT**. Depress the **SPEED DIAL** once more to confirm selection
9. To view monitoring parameters during pacing, press the **COLLAPSE** button "V" next to the **PACING** tab or press **HOME** on the right hand side of the screen. (Figure 7) While pacing is active, the pacing status will always be displayed in the message area at the top of the HOME screen. (Figure 8)
10. To return to the **PACING** screen, touch **PACING** in the lower right hand corner of the screen. (Figure 9)



Figure 6



Figure 7

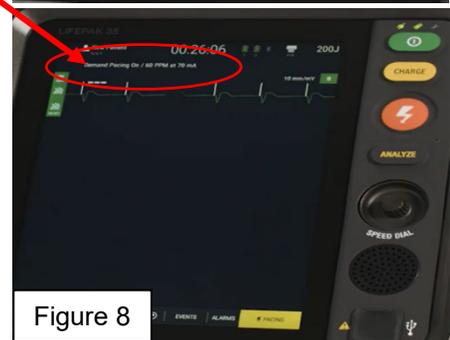


Figure 8

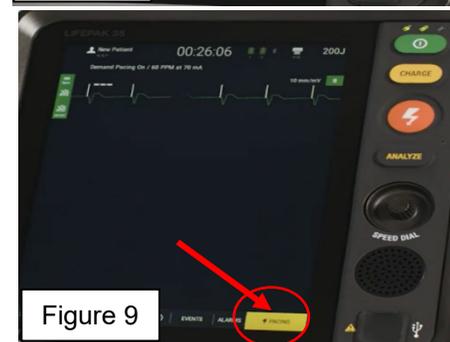


Figure 9

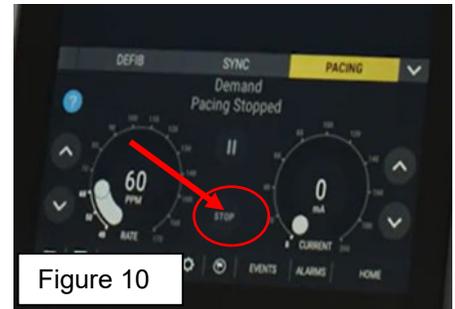


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11. Pressing the **PAUSE** button will cause the set pacing rate to decrease by 25% (eg. rate of 60 paces per minute changes to rate of 45 paces per minute) while it is being depressed. **This function should not be used without directive from OLMC**
12. If pacing therapy termination is required, power off the pacing function by pressing the **STOP** button on the lower middle of the screen. (Figure 10).



Pacing-Related Considerations:

1. In the event of ventricular fibrillation or pulseless ventricular tachycardia, pressing the **CHARGE** button will automatically stop the pacing function. Proceed with defibrillation.
2. If the monitor displays "**ECG LEAD OFF**" during transcutaneous pacing, pacing automatically switches to non – demand and continues at the fixed rate until the ECG lead(s) is reattached. During non – demand pacing, the pacemaker delivers pulses at the set pace rate regardless of any intrinsic beats that the patient may have. The monitor continues to display the pacing rate and the current. To reestablish demand pacing, reattach the ECG lead(s).
3. If the Quik-Combo™ electrodes detach during pacing, the monitor will display "**CONNECT ELECTRODES**" and "**PACING STOPPED**" messages and sound an alarm. The set pacing rate is maintained, but the current resets to 0 mA. Reattaching the Quik-Combo™ electrodes silences the alarm and removes the messages. The current remains at 0 mA until manually adjusted as described above.
4. Proper electrical capture is displayed by depolarization of the ventricles, reflected as a wide QRS, followed by a distinct, broad T wave (Figures 11 & 12). Absence of these findings immediately following pacing spikes generally indicates failure of consistent electrical and mechanical capture. (Figures 13 & 14)



Figure 11



Figure 12



Figure 13



Figure 14

5. With transcutaneous pacing, it may be difficult to see the paced QRS complex due to washout from the pacing stimulus. It is imperative to confirm capture by a physiologic measure such as a pulse