

Epicardial Pacing in Critical Care

Site Applicability

PHC Critical Care Units

Practice Level

Specialized: Registered Nurses with Critical Care education working in PHC Critical Care units

Requirements

Critical care nurses **are** responsible for:

1. Monitoring pacemaker settings
2. Adjusting settings with MD orders (CSICU only)
3. Monitoring for complications and intervening, according to protocol, when unintended outcomes occur.

Critical care nurses **are not** responsible for:

1. Independently initiating temporary pacing. (Except in emergency situations, CSICU only see [Pacemaker \(Temporary Epicardial\)](#)).
2. Adjusting pacemaker settings. (Except in emergency situations, CSICU only) see [Pacemaker \(Epicardial\): Temporary, Checking Intrinsic Rhythm](#)).
3. Removing epicardial-pacing wires. (Except RNs with additional education)

Need to Know

1. Batteries that are stored with the emergency pulse generators
2. Gloves should always be worn when handling electrodes and exposed epicardial wires to prevent micro-shock.
3. Typically, epicardial **atrial wires** are located on the right side of the sternum and **ventricular wires** are on the left side.
4. The only pacemaker cable used with epicardial wires are blue and/or white.
Epicardial pacing wires are connected in pairs to the connecting cable. Epicardial wires are unipolar and can be inserted into either positive or negative terminals.
5. The pulse generator box that is used for temporary epicardial pacing at Providence Health Care are the Medtronic Dual-chamber model 5392
6. If not attached to pulse generator, epicardial wires must be insulated to prevent micro-shock. (see [Appendix C](#))

7. CSICU only: pulse generator use is often very brief.. sometimes only a few hours...therefore the policy is not to change the battery with each new patient.

Protocol

Assessment and Interventions

Initial Assessment	Interventions
1. Conduct cardiac assessment as per protocol.	
2. Record initial pacemaker settings and make any changes including the mode, rate, output and sensitivity as per MD orders.	When initiating temporary pacing on a new patient; always ensure that is at least 2 bars on the battery life indicator
3. Obtain and mount baseline rhythm strip and assess for appropriate sensing and capture	If signs of failure to capture or inappropriate pacing or sensing, assess VS and hemodynamic status. Check all connections of the pacing system; consider changing battery or generator box. Notify physician.
4. Ensure "Pacer detect mode" has been activated on bedside Philips monitor	Press ECG numeric on screen...this will open ECG set up Press Pacer mode Select ON
5. Assess patient's response to pacing including vital signs and hemodynamic parameters.	If signs of decreased cardiac output and/or deteriorating vital signs, call for assistance and call physician.
6. Secure Pulse Generator safely at bedside so it is visible and easily accessible	In CSICU pulse generator either secured to bed or hung from ceiling IV pole

Ongoing Assessment	Interventions
1. Assess ECG rhythm and pacing and sensing function Q4hourly and with any change in rhythm (paced or intrinsic)	If signs of failure to capture or inappropriate pacing or sensing, assess VS and hemodynamic status. Check all connections of the pacing system; consider changing battery or generator box. Call physician.
2. Observe insertion site for redness, signs of infection.	
3. Complete Device Safety Checklist in Cerner Q shift and PRN	IDC is not done in Critical Care
4. Check for low battery indicator and connections Q4hourly	If a low battery indicator appears, change battery as soon as possible. Red light will start flashing at the battery status indicator when 1 bar is visible. Once red light begins flashing, battery life is 24

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	hours or less depending on pulse generator settings.
5. If battery change required, bring a second pulse generator to the bedside and adjust to the current settings and simply switch out the cables from the old pulse generator	Pulse generator only keeps charge for 30 seconds without a battery so it is safer to have pulse generator already set and ready in case there are issues with the new battery insertion

Discontinuing Pacing

1. When pacing via epicardial leads is discontinued, insulate and secure wires
2. When pulse generator is no longer required for pacing, wipe down and then return to the designated storage area in your unit
3. Discard batteries that **have 2 or less bars** on the battery life indicator

Documentation

Cerner

1. Interactive View and I&O >> Adult Critical Care Systems Assessment **2** >> Pacemaker/Cardiac Rhythm Devices. >> complete all relevant DATA cells>> which includes *Device Safety Checklist*
2. Document any **pacemaker setting changes** in Cerner pacemaker/Cardiac Rhythm Devices>. Activity >>> modify setting and “add Comment” to describe patient condition
3. Document **Rhythm changes** in Cerner in>> Cardiac Rhythm analysis and “add comment” to describe patient condition.
4. Document all **major pacemaker events** in a separate Nursing narrative note i.e. loss of capture
5. ECG Rhythm Strip Flow sheet (form ID 2892) Print and mount rhythm strip and analysis Q shift and PRN with any significant change in rhythm (no need to mount strip for simple rate, MA or sensitivity change) “add comment” in Cerner should capture this information

Patient and Family Education

1. Briefly describe need for pacemaker.
2. Explain pacemaker function in simple terms, and temporary nature.

Describe restrictions such as limitation of activity, the need to call for assistance with turning, not to handle the pacemaker or electrode, and not to use an electric razor

Related Documents

1. [B-00-12-10064](#) – Pacemaker (Epicardial): Temporary, Checking Intrinsic Rhythm
2. [B-00-13-10125](#) – Pacemaker (Temporary Epicardial) CSICU: Patient Care in Emergency Situations
3. [B-00-13-10150](#) - Pacing wire removal

References

1. Hackney, Genevieve (Jan 2022). Pacing: Temporary and Epicardial Pacemaker Management Retrieved from Elsevier online clinical skills October 2023
2. Estes, Mark, (2022) Temporary Cardiac Pacing. Retrieved from UpToDate October, 2023
3. Spotts, Valerie, Nikki J Taylor, and Jennifer Pesenecker. Temporary Transvenous and Epicardial Pacing, AACN Procedure Manual for Progressive and Critical Care-E-Book, Page 412-426
4. Medtronic. Model 5392 Temporary External Pacemaker Tip Card retrieved <https://asiapac.medtronic.com>products>files>, Accessed Nov 2023

Appendices

[Appendix A](#) - Pacemaker Cables

[Appendix B](#) – Medtronic Model 5392 Pulse Generator

[Appendix C](#) – Grounded Epicardial Wires

[Appendix D](#) – Medtronic Model 5392 Battery Replacement

Appendix A: Pacemaker Cables



Appendix B: Medtronic Model 5392 Pulse Generator (Temporary External Pacemaker)



Appendix C: Grounded Epicardial Wires

Place epi wires in glove finger (separating A & V wires)

Secure with Tegaderm

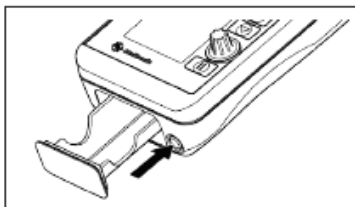
To ensure easy access in an emergency

Do not cover glove finger completely with Tegaderm

Appendix D: Medtronic Model 5392 Battery Replacement**MEDTRONIC MODEL 5392
BATTERY REPLACEMENT****Battery Installation and Replacement**

Note: Medtronic recommends disconnecting device from patient before replacing battery.

1. Press the battery drawer latch release button until the battery drawer opens.



2. Remove the old batteries.
3. Install two new LR6-sized (AA-sized) alkaline batteries. Verify that the batteries align with the polarity markings on the inside of the battery drawer.



4. Close the battery drawer firmly until the battery drawer is fully latched.

Note: Failure to close the battery drawer completely can result in the battery drawer opening and the temporary pacemaker shutting down.

5. Discard the old batteries properly according to local regulations.

Notes

- Replace the temporary pacemaker batteries in the following situations:
 - Replace the batteries for each new patient
 - Replace the batteries when the low battery indicator appears during temporary pacemaker operation
 - Replace the batteries at least once every week when the temporary pacemaker is in continuous use
- Install the batteries with proper polarity. The temporary pacemaker does not turn on or provide pacing therapy with incorrect battery polarity
- If during an emergency situation the batteries must be replaced while the temporary pacemaker is in use, ensure that the temporary pacemaker is locked before replacing the batteries. Pacing is maintained at the current settings for 30 s, minimum, if the settings are at nominal values.

Retrieved from Medtronic 5392 education information

Persons/Groups Consulted:

Cardiac Surgeon SPH

CNL's CSICU

Nurse Educator CICU SPH

CSICU Staff

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