Pacing Wires (Epicardial): Removal

Site Applicability

St Paul's Hospital 5A, 5B, CSICU

Skill Level

Specialized: Clinical Nurse Leaders, Nurse Practitioners, Nurse Educators and Clinical Nurse Specialists who have additional education and opportunity to maintain competence in removing epicardial pacing wires.

Related Documents and Resources

1. NCS5089 – Epicardial Pacing Wires: Insulation and Dressing (Critical Care)
2. NCS5436 – Pacemaker (Epicardial): Temporary, Checking Intrinsic Rhythm
3. NCS6402 – Epicardial or Transvenous Temporary Pacing in Critical Care: Patient Care
4. NCS6367 - Physical Assessment of Patient on a Cardiac Ward
5. NCS6347 – Epicardial Pacing and Pacing Wire Care on Cardiac Wards
6. Cardiac Surgery Clinical Pathway

Background:

During cardiac surgery, temporary epicardial pacing wires are placed prophylactically to manage bradyarrhythmias in the postoperative period. These wires are looped through or sutured onto the epicardium and brought through the chest wall for connection to an external pulse generator.

The wires are removed when pacing therapy is no longer indicated.

Complications after epicardial pacing wire removal may include cardiac tamponade, myocardial ischemia, graft site disruption, and arrhythmias. Hypotension, bleeding, and dyspnea are important signs and symptoms of cardiac tamponade.

Need to Know

- A Surgeon/NP order is required in order for RN to remove epicardial pacing wires
  - The order should include holding IV heparin infusions for 4 hours prior to removal and recommencement 2 hours post-removal if indicated.
- Removal of epicardial pacing wires in stable post-operative patients is a low-risk procedure if the patient fulfills criteria for removal
- In general, the patient must not be discharged within 4 hours of pacing wire removal

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Clinical Indications:

1. Stable post-cardiac surgery patients on or after day 3 post-operatively who have not required temporary pacing for more than 24 hours
    - In sinus rhythm or, if not, stable cardiac rhythm as determined by surgeon/NP
2. Stable post-heart transplant patients on or after day 4 post-operatively who have not required temporary pacing for more than 24 hours on
    - In sinus rhythm or, if not, stable cardiac rhythm as determined by surgeon/heart transplant cardiologist

Contraindications for RN removal of pacing wires:

- Absence of physician/NP order
- Required pacing within the last 24 hours
- Most recent INR greater than 2
- Most recent platelet count is less than 50 x 10^9/L
- Treatment with direct oral anticoagulants (DOAC)
- Treatment with IV Heparin within 4 hours of removal time
- Treatment with low molecular weight heparin (LMWH), with the exception of standard VTE prevention
- Treatment with platelet inhibitors (other than ASA)
- Presence of pre-existing coagulopathy
- Unstable clinical condition
- Unstable cardiac rhythm
- Weekends or after 14:00hrs on weekdays

PRACTICE GUIDELINE

Equipment & Supplies

Clean gloves

1 Alcohol swab per set of wires

1 scissors

Small dry plaster-type dressing (e.g. “Bandaid”)

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Procedure:

Procedure	Rationale/Photographs
1. Prior to commencement of procedure Ensure: • Surgeon/NP order on chart • Patient fulfills clinical indications for removal as outlined above • No contraindications exist as outlined above • Primary RN aware of pending removal	
2. If on IV heparin, obtain order from NP/surgeon to hold infusion 4 hours prior to procedure and recommence 2 hours after procedure.	Minimizes the risk of bleeding
3. Take vital signs prior to wire removal	Establishes hemodynamic baseline from which to assess any changes after wire removal
4. If not already on telemetry, place patient on telemetry and analyze rhythm.	Provides documentation of stable rhythm.
5. Explain procedure to patient	▪ Inform patient that they may feel a “pulling” sensation as wires are removed ▪ Inform patient that they will need to stay in bed for 45 min post-removal ▪ Occasionally may feel some fleeting mild pain
6. Position patient on bed in comfortable reclined position and adjust bed height to an ergonomic position.	▪ Patient should be comfortable and nurse should be in a relaxed, easy position. ▪ It is easier to remove wires when patient is reclined.
7. Wash hands	
8. Open scissors and alcohol swab and lay opened packets within reach. Leave dressing unopened as it may not be needed.	
9. Don gloves, remove old dressing and discard	
10. Clean hands (wash or alcohol cleanser) and don clean gloves	Wearing gloves when handling pacing wires minimizes the risk of micro-shock (static passing from you through the wires to the patient)

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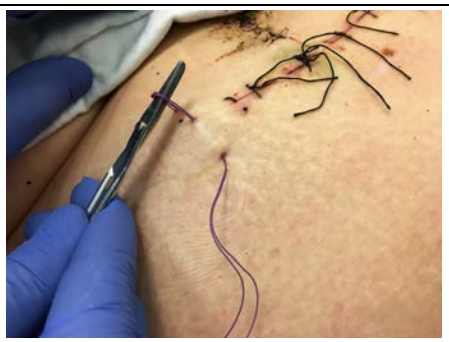
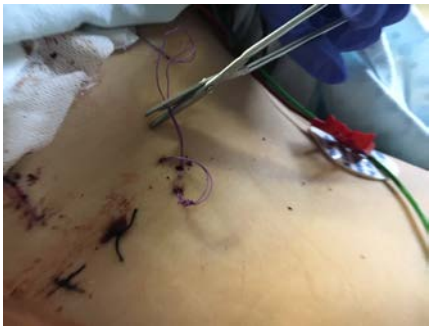
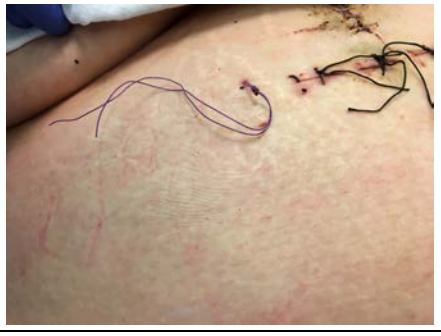
11. Wipe entry site/s of wires with alcohol swab/s and discard	
12. Using scissors, gently lift the small section of wire that has the knot in it on both sets of wires	
13. Cut atrial and ventricular epicardial wires near the skin, then pull newly cut section through skin in preparation to remove the wires	 
14. Ask patient to breath normally	There is no physiological need for patient to hold breath, just to be as relaxed as possible.

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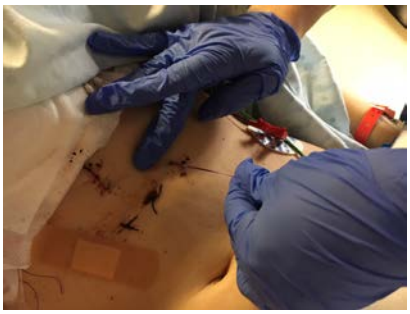
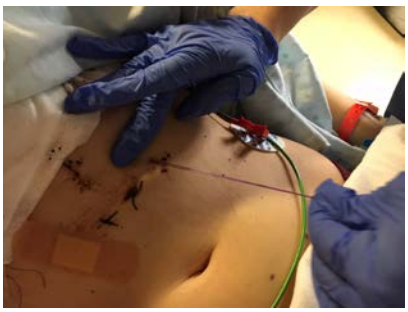
15. Starting with atrial wires; grasp wires firmly and pull SLOWLY and steadily towards patient's feet. You will feel some resistance and even pulsatility at first, after which wires should come loose and out. Discard.	  Atrial wires are on the right and ventricular wires are on the left. Although there is no evidence confirming that atrial wires should be removed first, this practice is followed in most centres.
16. If unable to remove wires using firm, steady motion, consult Surgeon or NP.	If wires are difficult to remove, stop and seek surgeon/NP's help
17. Repeat steps 14, 15 and 16 for ventricular wires.	
18. If any oozing, apply small adhesive dry dressing and instruct patient to remove it after 24 hours. If no drainage observed, application of dressing is not necessary.	
19. Remove gloves and clean area	
20. Inform primary nurse caring for patient that procedure is completed and to follow assess vital signs as outlined in 21, 22 and 23	
21. Post removal, check patient response and assess vital signs: Q15min x 2 then, Q30min x 1	In order to see early changes in hemodynamic status
22. Instruct patient to remain on bed rest for 45 minutes post removal and to report feelings of shortness of breath, dizziness,	To monitor for potential complications like tamponade, bleeding, dysrhythmias

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anxiety, restlessness, chest discomfort, nausea, rapid heartbeat or anxiety	
23. Contact a physician/NP if any of the above adverse reactions occur. **If the patient becomes hemodynamically unstable call a Code Blue immediately.**	
24. Recommence heparin infusion after 2 hours if patient is stable.	
25. If commenced solely for pacing wire removal procedure, discontinue telemetry 4 hours after removal if no arrhythmias	
24. Document procedure in health record (chart)	

Patient/Resident Education:

Instruct patient:

To remain in bed for 45 minutes post-procedure

To inform the nurse if they feel lightheaded or dizzy, chest pain, or shortness of breath

To remove dressing if present after 24 hours

Documentation:

- Clinical record - record vital signs.
- Cardiac surgery pathway/24-Hour Patient Care Flow sheet - record any assessment varying from baseline, nursing interventions and patient's response
- Interdisciplinary documentation – RN who removed the pacing wires to document removal time of pacing wires and care provided during removal
- NF259 Cardiac Surgery Temporary Epicardial Pacemaker (5B only)

References:

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3. Frew, J. (2016). Standardizing the practice for temporary epicardial wire removal [Abstract]. Canadian Journal of Cardiovascular Nursing, 26(3) 5.

4. Mullin, M. H., Roschkov, S., Jensen, L., Moore, G., & Smith, A. (2009). Sensations during removal of epicardial pacing wires after coronary artery bypass graft surgery. Heart & Lung, 38(5), 377-381.
5. Stacy, K.M. Pacing (ed): Epicardial Wire Removal Elsevier Clinical Skills (2017). St. Louis, MO. Elsevier. Retrieved May 10 2018 from www.elsevierskills.com
6. Woten, M. Epicardial pacing wires: removing. (2017) Nursing Practice and Skill CINAHL Information Systems, EBSCO

Persons/Groups Consulted:

Ottawa Heart Institute

St Vincent's Hospital, Sydney Australia

St Boniface Hospital, Winnipeg

Kelowna General Hospital

CNS Cardiology

CNL's 5A

CNL's CSICU

CNL's 5B

Nurse Educators 5A/B

Nurse Educator CSICU

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