

Electrophysiology Procedures: Intra-procedure Care of Patients Undergoing Diagnostic Electrophysiology or Ablation Procedures

Site Applicability

SPH Electrophysiology Labs

Practice Level

Specialized:

- Critical Care trained RNs who have completed additional unit orientation to the Electrophysiology Lab at SPH.
- Electrophysiology technologists who have completed education and/or training in electrophysiology.

Need to Know

- A wide variety of diagnostic and interventional electrophysiology procedures are performed in the Electrophysiology Lab and Cardiac Procedure Room. These procedures include but are not limited to supraventricular cases such as ATach and AVNRT as well as ventricular cases such as Ischemic and Idiopathic Ventricular Tachycardia ablation.
- Methods of ablation include radiofrequency (RF) and cryogenic ablation using N2O refrigerant.
- Special equipment required, such as 3-D Mapping and catheters will be documented on the EP booking form and reviewed during the safety huddle. The safety and set-up of all equipment is a shared responsibility by the nurses and EP technicians in the lab that day. Equipment will be determined as per physician preference and clinical need prior to start of the procedure.
- An anesthesiologist is present for all procedures with most cases being performed under a general anesthetic.
- Breaks should be taken in turn and adjusted to accommodate case requirements.
- Two staff members are required to be in the lab during a trans-septal puncture and VT ablation (1 RN + 1 RN or EP Tech).
- Physicians, nurses and EP technologists must wear headsets to facilitate communication among team members.
- Industry representatives may be present during complex cases as per physician request.

Protocol

A. Safety Checks:

The following equipment safety checks are performed and signed for daily by the nursing staff assigned to the lab before the first patient enters the lab. The **daily safety checks** consist of:

- Zoll defibrillator test. Ensure defibrillator is left at 200 joules
 - ECG cables/slave cable attached to Zoll defibrillator
 - Hands free defib pads connected
 - Zoll defib paddles and corresponding defib pads on Zoll
 - Battery changed monthly
- Temporary Pacemaker
 - Turn on pacemaker to ensure functionality and then turn off
 - Ensure temporary pacemaker wire, connector cable and spare generator in bin
 - See [B-00-13-10118](#) Epicardial Pacing in Critical Care for changing/checking battery
- Other equipment
 - CPR stool present
 - Portable suction present
 - Fluoroscopy set up and functioning
- Pericardiocentesis tray
 - Checked 1st Monday of the month
 - Tray is sealed
 - Check date, replace if expired or used
- ACT Machine daily QC and once weekly QC as per manufacturer's instructions

B. Pre-procedure preparation:

CSSU: Prior to the patient entering the room, the EP RN completes the EP Patient Safety Checklist ([Appendix A](#))

EP Lab: Both RN and EP Technologist share responsibility to prepare the patient for procedure.

- The EP Lab team completes a 'briefing/time-out' prior to induction of anesthesia (see [Appendix A](#)) and prior to establishing vascular access on every patient.
- Establish monitor connections and connect patient to appropriate equipment.
- Patient name is entered into the CardioLab and X-Ray system prior to start of the case.

C. Sterile Technique:

- The principles of sterile technique adhered to in the EP Lab are in accordance with the standards, guidelines and position statements of ORNAC (Operating Room Nurses Association of Canada).
- Surgical greens and warm-up jackets are provided and laundered by the hospital, and are the only attire permitted in the EP lab.
- Hats are worn at all times.
- Protective eyewear is recommended and provided for the scrub team.
- The scrub technique is posted in the scrub area and followed by all members of the team.
- The key principles of dispensing sterile equipment are strictly adhered to during EP procedures:
 - Only the working surface of a draped area is considered sterile.
 - Supplies are opened as close to the time of the procedure as possible, are continuously monitored, and are never left unattended.
 - Each package is checked for wrapper integrity and changed chemical indicators.
 - Large bundles or packages are opened on a flat surface
 - Items introduced onto the sterile field should be opened, dispensed and transferred by methods that maintain sterility and integrity.
- The scrub role adheres to the established draping procedure and maintains sterility while draping the patient.

D. Equipment and Electrophysiology Recording Management:

Routine maintenance, set-up and take-down of equipment used in the EP lab are shared responsibilities among staff. This equipment may include but is not limited to:

- CardioLab for EP recording, stimulation, measurements and charting
- Micropace for cardiac stimulation
- 3D-mapping equipment with CARTO and NavX
- RF generators and Cryo equipment
- Programmers appropriate to the cardiac implantable electronic device (if applicable)
- Transesophageal Echo (TEE)
- Intra-cardiac ultrasound (ICE)
- Compatible catheters and cables
- Fluoroscopy

E. Medication Administration:

- Medication administration for anesthesia, sedation or analgesia is given and managed by the Anesthesiologist.
- The RN will prepare medications for the sterile field when applicable. Label medications on the sterile field with the sterile pen and labels provided, and clearly state the drug name and concentration.
- The RN documents all medications on the medication administration record (MAR) and CardioLab report that are given by nursing.
- The RN, as informed, documents all medications given by the attending physician or delegate on the MAR and CardioLab document.

F. Radiation Safety:

- All staff should have an understanding of Radiation Safety and complete required and ongoing education when working in the EP Lab.
- Radiation safety is the responsibility of all team members working in the EP Labs.
- The ALARA (As Low as Reasonably Achievable) principles of radiation safety are adhered to in the EP Lab. The four main principles of ALARA are:
 - Minimize fluoroscopy time
 - Maximize the distance between staff and the radiation source. Doubling distance from the radiation source decreases exposure by 75%.
 - Radiation safety equipment
 - Personal protective lead must fit properly: Lead must be returned to hangers when not in use. The integrity of the lead is compromised if bent or folded for long periods of time. Use protective shielding when feasible.
 - Image optimization.
- Personal radiation dosimeters for staff are worn under protective lead. Dosimeters are measured three times per year by Health Canada.
- The patient radiation dose is documented on the CardioLab report.

G. Post-procedure care:

- All sheaths are removed by the EP physician in the lab upon completion of the case. On the rare occasion a sheath is to be removed in CSSU, refer to document [B-00-13-10063](#) – Cath Lab Post-Procedure for principles and management of sheath removal and ACT guided sheath removal guidelines.
- In CSSU, a sheath may be removed if there is a documented activated clotting time (ACT) of less than 150 seconds. ACT-guided sheath removal can be initiated by the CSSU nurse to expedite sheath removal and facilitate timely transfer or discharge.
- Nurses are **not** responsible for removing sheaths larger than **#8F** in an **artery** or **#14F** in a **vein**.

- Ambulation time is determined by the physician and written on the Post-Procedure Orders (PH487).
- All members of the EP Lab team are responsible for initiating, completing and participating in a “debriefing” at the end of each case. Refer to [Appendix A](#).
- Room change-over responsibilities are shared by all team members. This includes removal of patient name from CardioLab and the X-ray system in preparation for the next case.

Documentation

1. Nursing Record Cardiac Short Stay Unit (PHC-NF233): The RN is responsible for documenting on the intra-procedure section of the Nursing Record (tri-fold). This includes the summary of procedure, anticoagulation, vascular closure device, type of anesthesia, time of extubation if applicable and the short term medical plans.
2. Nursing Record Cardiac Cath/EP In-Patients (PHC-NF232):
3. CardioLab System Report: This report summarizes events during the procedure and includes equipment used, patient disposition, hemodynamic measurements, when applicable, medications administered (i.e. lidocaine, heparin), and the radiology summary.

Patient and Family Education

- Members of the EP Team will introduced themselves to the patient and family members present at bedside.
- RN and EP Tech will explain to the patient what they will be doing to get the patient prepped for the procedure once inside the procedure room (i.e. transferring onto the procedure table, connecting to equipment.)

Related Documents

1. [B-00-13-10090](#) - Cardiac Short Stay: Admission and Discharge
2. [B-00-13-10123](#) - Cardiac Short Stay: Care of Child/Youth Undergoing Interventional Cardiology or Electrophysiology Procedure
3. [B-00-13-10086](#) - Cardiology Procedures: Procedural Sedation General Anesthetic (CSSU); Care of the Patient Following
4. [B-00-13-10063](#)– Cardiac Cath Lab: Post Procedure Care

References

1. ORNAC Standards for Perioperative Registered Nursing Practice 11th Edition. (2013).
2. Woods, S.L., Sivarajan Froelicher, E.S., & Motzer, S.A. (2010). Cardiac Nursing (6th Ed.). Philadelphia: Lippincott Williams & Wilkins.
3. Andrade, Jason G, et al. (2016). *The Clinical Cardiac Electrophysiology Handbook*. Minneapolis, MN: Cardiotext Publishing.

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Appendix A - EP Lab Procedural Safety Checklist**Pre-Procedure (prior to bringing the patient into the room)**

- ☐ Emergency safety equipment has been checked (beginning of day and after use)
- ☐ Two patient identifiers
- ☐ Consent signed
- ☐ Planned procedure and planned anesthesia
- ☐ Special equipment identified and clarified with physician (refer to Physician Preference Manual for equipment lists)
- ☐ Does patient have a pacemaker or ICD device?
- ☐ Anesthesia has seen the patient
- ☐ Pre-procedure orders signed
- ☐ Review pre-procedure bloodwork (CBC, coags, lytes, Cr)

Briefing/Time-out (before sedation or induction of anesthesia)

- ☐ This is (patient name): _____
- ☐ Procedure: _____
- ☐ S(h)e is allergic to: _____ (verify with caution sheet)
- ☐ LD OAC: _____ INR: _____
- ☐ Defib pads on and connected
- ☐ Patient specific concerns communicated (i.e. OSA, overnight bed, isolation, device/implant, etc.)
- ☐ Patient information entered into monitor/TEE
- ☐ S(h)e will recover in: _____

Debriefing (before patient leaves the room)

- ☐ Procedure completed: _____
- ☐ Equipment problems identified and addressed: _____
- ☐ Pacemaker/ICD device re-programmed
- ☐ Key concerns at handover: _____
- ☐ Total Heparin: _____/Protamine given: _____

Persons/Groups Consulted:

Electrophysiology Physician Group
 Cardiac Anesthesiologists
 EP RN's
 Triage Coordinator
 Patient Care Managers, Cardiology
 Clinical Nurse Leader, EP Lab
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