

Implantable Cardioverter Defibrillator (ICD) Deactivation at End of Life

Site Applicability

All VCH and PHC Acute Care Sites

Practice Level

RN

- **Advanced Skill** – must have additional education, training and competencies related to devices and device deactivation if working in medicine, medical or surgical cardiac care, critical care, or palliative care.

Cardiovascular Technologists (CVT); Pacemaker Technologists; Cardiac Rhythm Technologists

- **Specialized Skill** –Technologists must have additional deactivation certification or perform under supervision of an Electrophysiology cardiologist.

Need to Know

Patients with an ICD may receive a shock, or a series of shocks, if the heart goes into a dangerous heart rhythm (ventricular tachycardia or ventricular fibrillation). To support patient goals of care, ICD therapy should be reviewed on an ongoing basis.

1. Guiding principles of ICDs:

- An ICD is an implantable device that is used to prevent sudden cardiac death caused by malignant ventricular arrhythmias.
- An ICD functions as a heart rhythm monitor, can act as a standard pacemaker (for slow heart beats) and can provide treatment for potentially lethal arrhythmias such as ventricular tachycardia (VT) or ventricular fibrillation (VF) with anti-tachycardia pacing or high energy shocks.
- Pacemaker devices do not have ICD capabilities.
- Not all ICDs have pacemaker capabilities. Subcutaneous ICD (SICD) does not routinely pace.
- Deactivating the ICD will mean that the device will not prevent sudden death in the event of a dangerous arrhythmia (VF or VT). It does not cause the patient's death. It allows for a natural death.
- ICD shocks can cause pain and anxiety. It is important to discuss deactivating the ICD when the patient's clinical status worsens, as it may no longer be the patient's desire to prolong life in the event of a deterioration of their quality of life.
- Deactivation refers to turning off defibrillator function of the device **not the pacemaker function (if any)**.

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2. Deactivation of ICD:

- Should be discussed multiple times throughout the continuum of care.
- Requires an order from a provider.
- Turning off the ICD defibrillation therapies does not affect the ICD pacemaker function
- The following circumstances may lead to ICD deactivation at EOL
 - No longer meets client goals of care (e.g., palliative clients)
- The following circumstances may lead to ICD deactivation for reasons other than EOL:
 - Lead dislodgement, migration, or fracture
 - Inappropriate identification of the rhythm
 - Inappropriate defibrillation threshold

3. Planned Deactivation:

May occur if device is not functioning appropriately to ensure safety and prevent harm to patient. May occur when patient:

- requests deactivation
- status changes and/or;
- ICD no longer meets goals of care.

When ICD is deactivated, ensure that the patient's health care team members are notified.

Note: If temporary deactivation is required for procedures where electromagnetic interference may interfere with device function, refer to specific procedures such as Endoscopy, MRI, or operating room guidelines.

4. Unplanned Deactivation:

- This occurs when a patient is imminently dying and/or is too frail for transport to a device clinic or other locations where deactivation can occur (e.g. ED).
- For urgent deactivation with a programmer, when possible, a device clinic team member (or qualified team member) will travel to where the patient is located ensuring that the patient's comfort and well-being is accommodated.
- For urgent deactivation with a magnet, health care team members will:
 - Obtain a provider's written order. If this is not possible, a verbal order is acceptable in urgent situations but must be followed up by a written order(See VCH/PHC Medical Staff Rules)
 - Apply a magnet over the ICD to prevent the delivery of a shock; this will not affect the pacemaker function of the device.
- When ICD is deactivated, ensure that patient's primary health care team members (e.g. patient's general practitioner) are notified and appropriate documentation completed.
- All hospital emergency rooms, critical care units, crash carts on all units, cardiology procedure rooms and surgery units should be equipped with a specific medical grade

magnet. In addition, it is recommended that the following settings and health care providers obtain magnets:

- Palliative Care Centers
- Long-Term Care Homes
- Regional Community Health Centers
- Hospice Facilities
- Home Visiting Palliative Care Physicians and Nurse Practitioners

5. Documentation:

A provider's written order is required. In an urgent/unplanned situation a provider may give a verbal order until a written order is written (See VCH/PHC Medical Staff Rules)

Standardized documents to support appropriate documentation include the following:

- [ICD Deactivation Referral Form](#)
- [ICD Deactivation Consent Form](#)
- [ICD Deactivation Order Set](#)

6. Post – Mortem Handling:

In most cases a patient may be buried with an ICD. There may be cases when an ICD is required to be removed or explanted, such as, at the request of the family, for further analysis or for cremation.

An ICD will explode if cremated, so they must be removed by a mortician or a pathologist at autopsy, if performed.

Equipment and Supplies

1. ICD Programmer
2. Medical grade magnet
3. Heavy grade tape
4. Required documents – order set, consent form

ICD Deactivation Guideline

1. Planned ICD Deactivation:

- Provider to confirm:
 - patient's cardiac implantable electronic device has ICD function
 - provider to give order for ICD deactivation
- Referral sent to a Device Clinic

To be completed in Device Clinic for non-urgent/planned deactivation:

1. Confirm that the following are completed:
 - a. Provider ICD Deactivation Order Set
 - b. ICD Deactivation Consent Form
2. Perform hand hygiene before patient contact.
3. Verify patient identity using at least two patient identifiers.
4. As appropriate, answer any questions as they arise and reinforce information as needed.
5. Set up the ICD programmer at the patient bedside and interrogate the patient's device.
6. Follow the specifications noted in the ICD Deactivation Order Set.
7. Turn off tachyarrhythmia detection and/or therapies.
8. Turn off relevant alarms including home monitoring alarms associated with the ICD functions.
9. Perform hand hygiene after patient contact.
10. Document the following information in the patient record, for example but not limited to:
 - a. Date and time of ICD deactivation
 - b. Therapies that were deactivated and patient response
 - c. Alarms that were turned off
 - d. Report has been sent to primary care practitioner
 - e. Report whether patient might wish to reactivate at a later date

If the patient is too frail or weak to be transported to a Device Clinic, refer to section 2. Unplanned ICD Deactivation

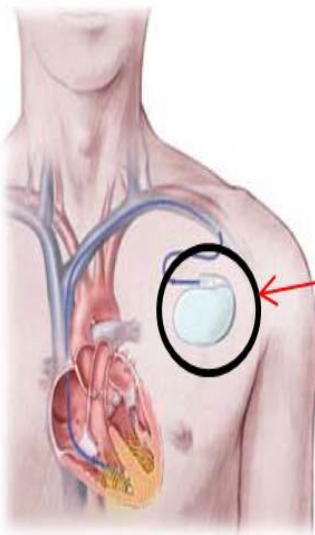
2. Unplanned ICD Deactivation

- Provider to confirm patient's cardiac implantable electronic device has ICD function.
- If the patient has a sudden deterioration in their health status and requires urgent deactivation of ICD, when possible, a Device Clinic team member (or qualified team member) will travel to where the patient is located ensuring that the patient's comfort and well-being will be accommodated.
- Where a Device Clinic team member (or qualified team member) is not available for travel, the following options should be considered:
 - Medical transportation of patient to the Device Clinic;
 - Medical transportation of patient to the closest emergency department; or
 - Use an alternative qualified healthcare team member who travels to patient in whatever care setting they are situated.

If the above is not possible, the following steps are required to deactivate an ICD with a magnet:

1. Confirm that the following are completed:

- a. Provider written order (DEACTIVATION OF IMPLANTED CARDIOVERTER DEFIBRILLATOR (ICD) ORDERS). If this is not possible, a verbal order will be accepted in urgent situations but MUST be followed up with a provider written order (See VCH/PHC Medical Staff Rules)
 - b. Consent for ICD Deactivation.
2. Verify patient using at least two patient identifiers.
3. As appropriate, answer any questions as they arise and reinforce information as needed.
4. Perform hand hygiene.
5. Locate the site of the ICD generator.
6. Place the clinical magnet over the ICD generator.



Place clinical magnet over ICD device.



7. Securely tape clinical magnet over ICD device. Mark skin with boundaries for placement.
8. Monitor placement of clinical magnet position to ensure magnet does not become accidentally displaced. Re-align to skin markings if displaced.
9. Magnet will inhibit for 8 hours only. Remove magnet every seven hours for a few seconds then reapply over the defibrillator as marked and secure with tape.
10. Make arrangements for definitive deactivation as soon as possible.
11. When patient dies, ensure clinical magnet remains taped to patient chest for a minimum of 30 minutes after death or unit definitive deactivation occurs.
12. Perform hand hygiene after patient contact.

3. Post Mortem

Post-mortem handling if the device is to be removed or explanted:

- Turn off shock therapy
- Remove device and disconnect the leads (leads do not need to be removed)
- Place in biohazard waste packaging
- Return to manufacturer for device analysis if part of a trial or for other reasons.

4. Documentation

Document the following information in the patient record, for example but not limited to:

- a. date and time of ICD deactivation (with a programmer or a magnet)
- b. therapies that were deactivated (programmer only)
- c. alarms that were turned off (programmer only)
- d. if applicable, patient or family response to deactivation
- e. report sent to primary care practitioner

Patient and Family Education

1. BC Heart Failure Network: End of Life Tools
2. CorHealth Ontario:
 - a. ICD Deactivation – [A Guide for Patients and Family](#)
 - <https://www.corhealthontario.ca/Implantable-Cardioverter-Defibrillator-Deactivation-A-Guide-for-Patients-and-Families.pdf>
 - b. ICD Deactivation – [A Guide for Health Care Professionals](#)
 - <https://www.corhealthontario.ca/Implantable-Cardioverter-Defibrillator-Deactivation-A-Guide-for-Health-Care-Professionals.pdf>

Related Documents

- [BC Heart Failure Network](#) EOL Resources
- [End of Life intranet webpage](#)
- [Heart Health intranet webpage](#)
- Metronic Operations and Magnet Application Link: https://wwwp.medtronic.com/crs-upload/letters/102/102_CQES-StandardLetter-MagnetInstructions-Combined-IPG-and-ICD-FINALv2-2016-Sep02.pdf
- **PEOPLESOFT Order:**
 - **PEOPLESOFT# 00021210**
MAGNET PACEMAKER TEST 2/PK
(VMID MEDTRONIC 174105-2)
2019 \$60.00 2/PK
 - **MEDTRONIC REP FOR PHC**
Randy Yamaoka
CELL 778-227-7374

References

1. Bernstein, A. D. (1993). North American Society of Pacing and Electrophysiology policy statement. The NASPE/BPEG defibrillator code. *Pacing Clinical Electrophysiology*, 16[9], 1776-1780.
2. BC's Heart Failure Network: Quality care for quality life. Retrieved on March 3rd, 2016: <http://www.bcheartfailure.ca/>
3. Forman, J., Baumbusch, J., Jacson, H., Lindengerg, J., Shook, A., Bashir, J., (2018). Exploring the Patients' Experience with a Subcutaneous Implantable Cardioverter Defibrillator. *European Journal of Cardiovascular Nursing*, 17:5, pages 1-9.
4. Implantable Cardioverter-Defibrillator: Deactivation and Reactivation. Elsevier Clinical Skills (November 2017). St. Louis, MO. Elsevier. Retrieved January 2018 from www.elsevierskills.com
5. British Cardiovascular Society, Resuscitation Council (UK), Deactivation Of Implantable Cardioverter-Defibrillators Towards the End of Life, March 2015

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Owners: <i>(optional)</i>	PHC / VCH	
	<ul style="list-style-type: none"> • VCH/PHC Regional Heart Failure Strategy • VCH/PHC Professional Practice • Provincial Heart Failure Steering Committee, Cardiac Services of BC Development Lead <ul style="list-style-type: none"> • RN, MSN, CNS Regional Heart Failure Strategy Development Team Members <ul style="list-style-type: none"> • Cardiologist, EP, PHC • Cardiologist, EP, PHC • Cardiologist, EP, PHC • Cardiologist, EP, PHC • RN, Devices Clinic, PHC • RN, Patient Care Manager, PHC • Quality, Patient Safety, Risk Management, PHC • Cardiologist, EP, PHC • CNS, Heart Rhythm, PHC • RN Palliative Outreach, PHC • Cardiovascular Surgeon, PHC • RN, EP and Devices Triage Coordinator, VA • Pacemaker Technologist VA 	

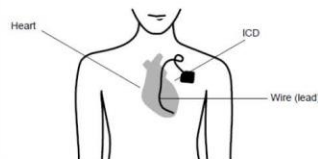
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Appendix A: Implantable Cardioverter Defibrillator (ICD) Information Sheet for Health Care Professionals (BC Heart Failure Network resource)

Implantable Cardioverter Defibrillator (ICD) Information Sheet for Health Care Professionals



An implantable cardioverter defibrillator (ICD) is a device implanted in a patient's upper chest which monitors the heart rhythm, can act as a standard pacemaker, can provide anti-tachycardia pacing and if required, can deliver one or more high energy shocks to terminate potentially lethal arrhythmias such as ventricular tachycardia (VT) or ventricular fibrillation (VF). Receiving a shock can be painful and psychologically traumatic and is often described by patients as feeling like a kick in the chest.



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Limitations of an ICD

Although ICDs reduce sudden cardiac death, patients will ultimately die from either heart failure or another disease. As a patient's disease progresses, physiologic changes may cause more arrhythmias and increase the frequency of shocks. Because ICD shocks can cause pain and anxiety and may not prolong a life of acceptable quality, it is important to consider deactivating the ICD when a patient's clinical status worsens and death is near.

Deactivating an ICD with a programmer

MUST have a physician's order and a qualified health care provider to apply the magnet

Deactivating an ICD refers to turning off the defibrillator function of the device, not the pacemaker function. Deactivating an ICD is not a difficult procedure; however it does require the use of a programmer - a laptop computer specifically made by the device manufacturer. Typically an ICD is deactivated by a health care provider who is familiar with the programmer and is competent in adjusting the settings of an ICD.

It is possible to turn off the pacemaker function of the ICD; however this is generally not something that is done. While deactivating the defibrillator function prevents painful shocks, deactivating the pacemaker does not prevent pain and may actually worsen the patient's heart failure symptoms by reducing the amount of blood pumped out of the heart.

Deactivating an ICD with a magnet

MUST have a physician's order and a qualified health care provider to apply the magnet

The preferred method of deactivating an ICD is to use a programmer; however one may not always be available, particularly in urgent situations. If a programmer is not available, it is possible to prevent the delivery of a shock with the use of a magnet. Placing a large magnet (the size of a doughnut) over the device will temporarily suspend the arrhythmia detection function of the ICD and prevent the delivery of a shock. The site of magnet placement is important, as a poorly placed magnet may not inhibit shock therapy. Magnets are best placed directly on top of the ICD. When the magnet is removed, the ICD will return to its previous settings.

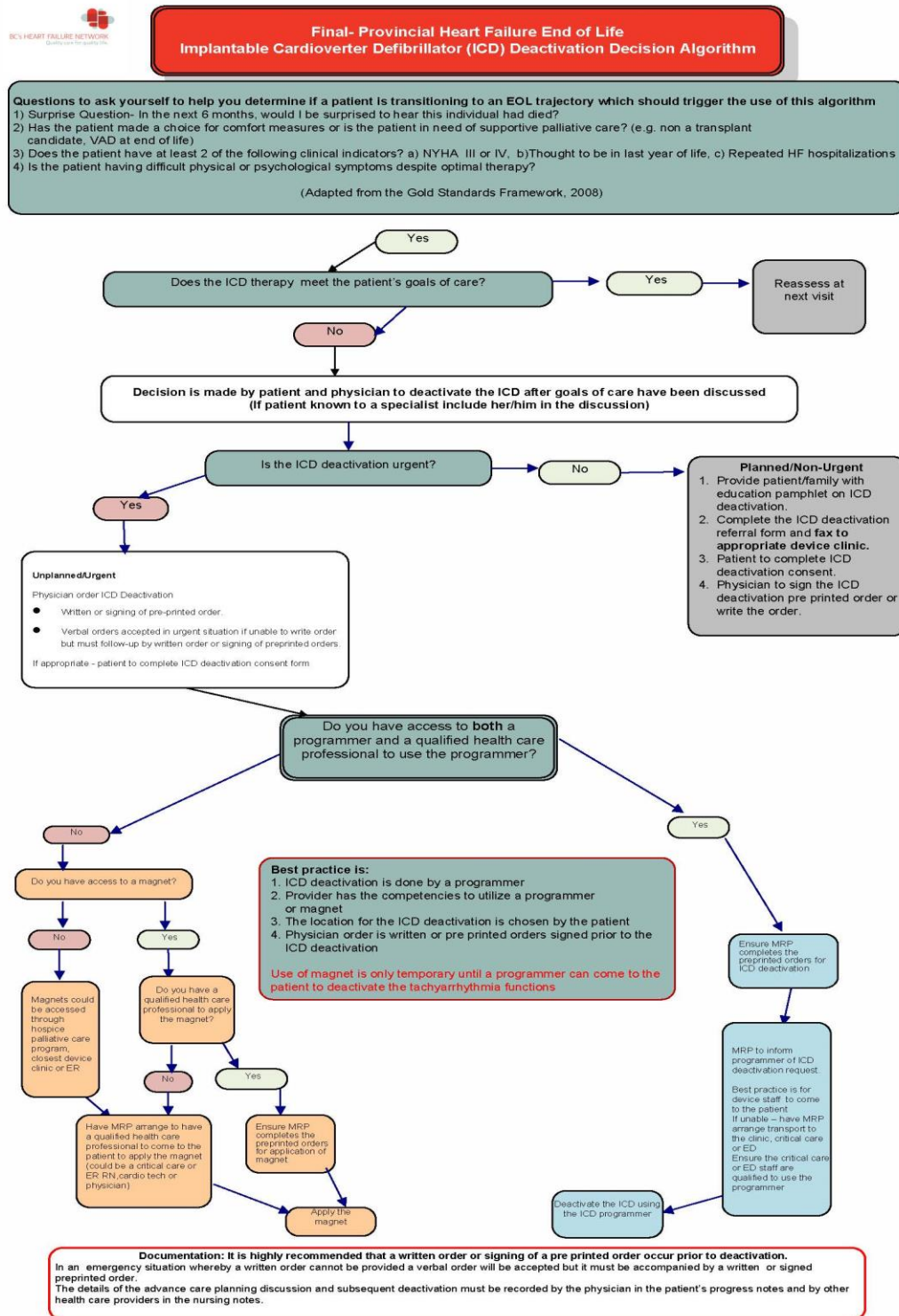
Things to keep in mind

- Deactivating the ICD will not cause the patient's death; it is simply allowing nature to take its course.
- Deactivating the ICD will not cause the patient's death to be more painful.
- Deactivating the ICD will mean that the device will not prevent sudden death in the event of a dangerous arrhythmia.
- Patients may reach a point in their lives when their goal of care is to be comfortable during their remaining time and an active ICD is not congruent with that goal.
- It is not morally or legally wrong to stop any medical treatment if it no longer meets the patients' needs.

December 2014

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Appendix B: Provincial Heart Failure End of Life Implantable Cardioverter Defibrillator (ICS) Deactivation Decision Algorithm (BC Heart Failure Network resource)



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Appendix C: Referral for Deactivation of ICD



REFERRAL FOR DEACTIVATION OF IMPLANTED CARDIOVERTER DEFIBRILLATOR (ICD) (Regional)

Client/Patient Information Name: _____ Phone Number: _____ Address: _____ Patient's current location: <input type="checkbox"/> Acute Care hospital <input type="checkbox"/> Non Acute hospital <input type="checkbox"/> Community facility <input type="checkbox"/> Home Name of hospital/ facility: _____ <i>If patient transitioning to End of Life/Palliative care, it is strongly recommended they be referred to Home and Community care</i> Name/contact information of family member/legal guardian or temporary substitute decision maker: Name: _____ Phone Number: _____ Address: _____	
Contact Information for Person Requesting Deactivation of the ICD Name: _____ Position: <input type="checkbox"/> RN <input type="checkbox"/> Nurse Practitioner Phone Number: _____ <input type="checkbox"/> GP <input type="checkbox"/> Internist Fax number: _____ <input type="checkbox"/> Cardiologist <input type="checkbox"/> Family member Primary Care Physician contact information (if different from above): Name: _____ Phone Number: _____ Is the patient aware the ICD deactivation has been requested? <input type="checkbox"/> Yes <input type="checkbox"/> No If No explain why: _____ Name and contact information of other health care provider team members that need to be contacted: Name: _____ Phone: _____ Name: _____ Phone: _____	
Device Details: ICD Manufacturer: _____	
Include with the referral: Copy of most recent consultation from palliative care (if available) Completed and signed Do Not Attempt Resuscitation (DNAR) order Any pertinent history including last EP consultation or an unusually placed ICD Comments:	
Signature of person requesting deactivation: _____ Date of request: _____	

Fax completed referral and other required documents to preferred Device Clinic (see locations on reverse).

Acknowledgment of referral: (Device clinic fax back date and time to referring physician/NP)

Your patient has been booked for their ICD deactivation at:

_____ hospital on Date _____ Time _____

Appendix D: Consent for Deactivation of ICD



PATIENT CONSENT FOR DEACTIVATION OF IMPLANTED CARDIOVERTER DEFIBRILLATOR (ICD) (Regional)

Must be reviewed with and signed by patient, parent, legal guardian, or substitute decision maker prior to deactivation.

DISCUSSION and CONSENT

My Physician or Nurse Practitioner (printed name) _____ has discussed the full details and consequences of TURNING OFF THE SHOCK DELIVERING THERAPY of the Implanted Cardioverter Defibrillator (ICD).

It was explained to me that:

- In the event of a dangerous rapid heart rate, turning off the ICD will no longer provide a lifesaving therapy such as electrical shock and/or anti-tachycardia pacing
- Turning off the ICD will NOT cause death
- Turning off the device will NOT be painful, nor will its failure to function cause pain
- Turning off the ICD lifesaving therapy function does NOT turn off the pacemaker function
- Shocks at end of life do not prolong life and can be painful
- I can change my mind and have the ICD lifesaving therapy turned back on

I understand the information as it has been explained to me and I have had a chance to ask questions.

My Health Care Provider has answered all my questions to my satisfaction.

I agree to proceed with deactivation of the shock delivering therapy of my Implanted Cardioverter Defibrillator (ICD).

I understand that I can change my mind and request the ICD's lifesaving therapy to be turned back on.

Signature (Patient or Substitute Decision Maker*)

Printed name (if Substitute Decision maker)

* Identification of Substitute Decision Maker form must be completed (PHC-MR081)

Date

Signature of Physician or Nurse Practitioner

Printed name

TELEPHONE CONSENT

I have discussed the full details and consequences of TURNING OFF THE SHOCK DELIVERING THERAPY of the patient's Implanted Cardioverter Defibrillator (ICD) with _____ who is the patient's (relationship) _____ and they have given verbal consent as the substitute decision maker.

At the earliest opportunity, if possible, the person granting consent by phone should sign the consent section above.

Physician or Nurse Practitioner Name

Signature

Date and Time

DECLARATION OF INTERPRETER


I have accurately interpreted the conversation between (Health Care Provider) _____ and (Patient or Substitute Decision Maker) _____ and interpreted this document to (Patient or Substitute Decision Maker) _____, who told me that he/she understood the explanation and consents to the procedure described above.

Interpreter Signature

Printed Name

Date and Time

Appendix E: Pre-Printed Orders (Regional) for Deactivation of ICD at End of Life

IF YOU RECEIVED THIS FAX IN ERROR, PLEASE CALL 604-806-8886 IMMEDIATELY	
	PRESCRIBER'S ORDERS
NO DRUG WILL BE DISPENSED OR ADMINISTERED WITHOUT A COMPLETED CAUTION SHEET ALLERGY/INTOLERANCE STATUS FORM (PHC-PH047)	
DATE AND TIME	DEACTIVATION OF IMPLANTED CARDIOVERTER DEFIBRILLATOR (ICD) ORDERS (Regional) <small>(Items with check boxes must be selected to be ordered)</small>
<div style="text-align: right;">Page 1 of 1</div> <p>INDICATION FOR TURNING OFF THE VENTRICULAR TACHYCARDIA/ FIBRILLATION DETECTION FUNCTION OF THE ICD:</p> <p><input type="checkbox"/> Use of the ICD tachycardia/Fibrillation therapy does not align with the patient's goals of care</p> <p>Other: (specify) _____</p> <p>CONSENT: Prescriber to confirm the full details and consequences of turning off the tachycardia detection lifesaving therapy have been explained to the patient/family or substitute decision maker and are fully understood</p> <p><input type="checkbox"/> Consent for Deactivation of ICD has been reviewed and signed by patient or substitute decision maker</p> <p><input type="checkbox"/> Consent has not been signed – reason: _____</p> <p>DEVICE AND DEACTIVATION:</p> <p>ICD Manufacturer: _____</p> <p>ICD location (right or left): _____</p> <p>Functions to remain active: _____</p> <p>Expected deactivation date: _____</p> <p>CODE STATUS: Ensure Resuscitation and Options for Care / DNAR orders (PHC-PH254) or Home DNR have been completed</p> <p>DEACTIVATION ORDER:</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> Application of magnet is usually a short term measure, as this will temporarily inhibit the ventricular tachycardia/fibrillation detection function only when the magnet is applied over the ICD (alert tones may still sound). Wherever possible, the ICD function should be turned off by the programmer. </div> <p><input type="checkbox"/> Deactivate by programmer: All ventricular tachycardia/fibrillation detection and therapies All appropriate alert tones are programmed off</p> <p><input type="checkbox"/> Application of Magnet: Apply and secure the magnet directly over the ICD</p>	
<div style="display: flex; justify-content: space-between;"> Printed Name _____ Signature _____ College ID _____ Contact Number _____ </div>	

Form No. PHC-PH741 (Jul 23-18)

ALL NEW ORDERS MUST BE FLAGGED

FAX COMPLETED ORDERS TO PHARMACY PLACE ORIGINAL IN PATIENT'S CHART

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