The Champlain Region Deactivation of Implantable Cardioverter Defibrillator (ICD) Guidance Document

Process to Revise Guidance Document

The original document was developed using a consensus process involving representatives from various disciplines and settings, including palliative care and cardiology specialists.

The guidance document will be reviewed every two years by members of the University of Ottawa Division of Palliative Medicine. This process will include a review of international peer reviewed literature related to the topic, as well as any local, national and international guidelines. Any suggested revisions made will be circulated broadly to representatives across the region from various disciplines and settings for input and review before being adopted.

Introduction

An Implanted Cardioverter Defibrillator (**ICD)** is a small, battery-powered **implantable device** that is surgically placed under the skin to monitor the heart's rhythm and deliver electrical shocks or painless ventricular pacing to correct life-threatening fast heart rhythms [e.g., ventricular tachycardia (VT) or ventricular fibrillation (VF)], preventing sudden cardiac arrest and/or death.

This guidance document focuses on the deactivation of ICDs in the context of a palliative approach to care and at the **end of life**

Deactivation of ICDs in patients approaching the end of their lives is an essential component of the care plan. Whenever possible, deactivation should occur proactively, earlier in the disease trajectory to reduce the likelihood of undesired, often painful shocks in patients who are at the end-of-life.

Discussion about deactivation should be collaborative, involving the patient, their caregivers and their multidisciplinary care team. Conversations about deactivation of ICDs should occur with any change in patient condition, such as with an admission to hospital for acute exacerbation of underlying disease, with a decline in functional status, or with any new diagnosis that might shorten life expectancy. In fact, it is recommended that a discussion about deactivation occur between cardiology and the patient, prior to ICD insertion. For example, a cardiologist may discuss deactivation with patient and caregivers when life prolongation would not fit within their goals of care, when they are no longer able to participate and engage in activities that bring them purpose or meaning.

If ICD deactivation is consistent with the goals of care, and the patient or SDM provides informed consent for ICD deactivation, there are two options:

- Deactivation of the defibrillation function using a programmer (see below for more details)
    - This is best done at device clinic particularly if they are mobile
    - In Champlain region, it can also be completed in patient's location of care
    - This is preferred for patients with more than a few days to live
- Temporary deactivation of the defibrillation function using a magnet (see below for more details)
    - This is preferred for patients who are in their final hours or days and who have limited mobility

Important Considerations

- ICD therapy should align with patient's goals of care and be discussed with patients, family / caregiver / substitute decision makers, as appropriate, throughout the

continuum of care as part of goals of care conversations.

- Deactivation of ICDs will not result in immediate death. It only means that the ICD device will no longer send electrical current to shock the patient in attempt to prevent a sudden death in the event of a dangerous arrhythmia (Ventricular fibrillation or Ventricular tacchycardia)
- ICDs are different from Pacemakers.
- All ICDs have **inbuilt pacemaker capabilities.**
- Deactivation of ICDs refers to turning off the defibrillator function (tacchyarrythmia detection and therapies) and **NOT the pacemaker function**
- Although it is possible to turn off the pacemaker function of an ICD, this is generally not done. Pacemaker function speeds up the heart rate if it is ever too low. The pacemaker function does not shock the patient and thus does not cause harm. Maintaining pacemaker function does not halt a natural death. Deactivating the pacemaker function may worsen the patient's heart failure symptoms such as dizziness, syncope, and dyspnea.
- If magnet is placed over a Pacemaker, NOT an ICD with pacemaker function, it will convert the Pacemaker to asynchronous mode which **carries a theoretical risk of** arrhythmias.

Site Applicability

All Champlain sub-region community sites (including the patient's home, group homes, hospices, retirement homes and Long-Term Care homes) and hospitals.

Practice Level

ICD deactivation with a magnet is within the Registered Nurse (RN) or Registered Practical Nurse (RPN) scope of practice so long as the nurse has the knowledge, skill and judgement to safely perform the procedure. Administrative safeguards (an order, agency policy) must also be met.

Organizations are encouraged to develop policies and procedures to support the deactivation of defibrillators by nurses. It would fall to the organization to determine whether this skill may be delegated (to unregulated care providers).

Requirements

- A Physician / Nurse Practitioner order is required to deactivate an ICD.
- Informed consent, obtained by the Physician / Nurse Practitioner, agreeing to deactivation is required and documented.
- If deactivating with a magnet, a medical grade magnet is required. Please see **Appendix B** for list of suggested locations to obtain magnet.

Process

If patient is well enough to attend an outpatient appointment: the preferred setting for deactivation of an ICD is always a Device Clinic Setting

For patients being discharged from acute care, with a Do Not Resuscitate order in place, with a plan for community-based end-of-life care, consider deactivating the defibrillator prior to discharge, to reduce the financial and physical burden of travel to a device clinic.

When deactivation is non-urgent and patients are physically able to attend a cardiac device clinic, arrangements should be made to have the ICD's defibrillator function deactivated using a programmer at the device clinic at the University of Ottawa Heart Institute (UOHI). The phone number for the UOHI device clinic is: 613-696-7076.

The MD / NP will need to complete and fax a referral to the UOHI Device clinic. This can be completed electronically using the EPIC charting system or can be submitted by fax to 613-696-7158

An appropriate referral will include the following:

- Diagnosis and brief clinical history;
- Goals of Care discussion, including patient and caregiver understanding of deactivation (see sample letter in Appendix C); and
- Latest clinic note.

If the patient is too unwell to attend an outpatient appointment but is not imminently dying: consider deactivation with a programmer in the patient's location of care

When deactivation is required, but patients are physically unable to attend the device clinic, arrangements should be made to have the ICD's defibrillator function deactivated using a portable programmer in their current location of care. This process is currently in pilot phase in the Champlain sub-region of Ontario Health-East, and access to this service **IS NOT GUARANTEED**. Where possible, deactivation in a clinic environment is always preferred.

The MD/NP will need to complete the following steps:

- Make note if patient has dextrocardia or other implantable devices;
- Document Goals of Care discussions including patient or SDM consent to proceed with device deactivation;
- Ensure availability of a medical grade magnet in patient's location of care if a more urgent deactivation is required (see below "deactivation with a magnet in the patient's home"); and
- Send a referral to Regional Palliative Consult Team (RPCT) indicating this is specifically for ICD deactivation; the referral form may be accessed from: RPCT Referral Form.
    - **An appropriate referral will include the following:**
        - Diagnosis and brief clinical history;
        - Goals of Care discussion, including patient and caregiver understanding of deactivation (see sample letter in Appendix C); and
        - Latest clinic note

- An RPCT team member will coordinate the deprogramming procedure with the UOHI team, the patient and their caregiver(s), and carry out the procedure.
- Reminder: Access to this service is NEW in the Champlain sub-region and subject to delays in service as processes are refined. Deactivation in a clinic setting is preferred whenever possible.

If the patient has prognosis of hours to short days: Deactivation with a magnet in the patient's location of care

Deactivation may be performed by a Physician, Nurse Practitioner or Nurse using a medical grade magnet in the event a patient is functionally unable to attend an outpatient appointment at the device clinic for deactivation with a programmer, such as, when a patient is too frail for safe transport, has a **Palliative Performance Scale** of 20% or less, and/or is imminently dying, e.g., in the last 72 hours of life.

It is recommended that all hospitals, hospices and Long-Term Care homes have their own magnet(s). For community dwelling patients, a magnet can be requested via the manufacturer of the patient's ICD (this information is typically available on their ICD wallet card).

Equipment and Supplies

- Medical grade magnet;
- Medical grade tape;
- Permanent marker; and
- Optional: thin foam or gauze pad.

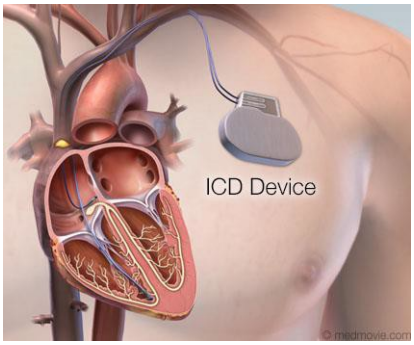
Procedure:

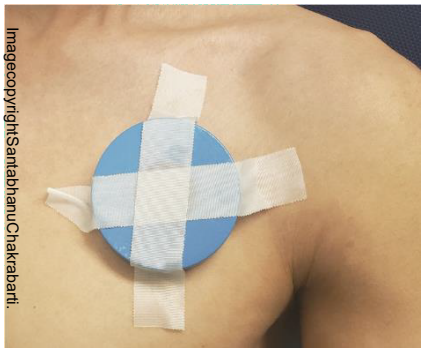
1. Confirm the patient is unable to attend a clinic for ICD deactivation with a programmer.
2. Confirm that the following have been completed by the MD/NP:
    a. Documentation of the goals of care conversation and consent of the patient/ Substitute Decision Maker (SDM) to ICD deactivation.
    b. Confirm there is a written order to carry out the procedure. If this is not possible, a verbal order will be accepted in urgent situations but MUST be followed up with a written order.
3. Verify patient using at least two identifiers.
4. Explain procedure, answer any questions as they arise and provide education and emotional / psychosocial support as needed.
5. Perform hand hygiene before and after patient contact.
6. Locate the site of the ICD device by reviewing patient chart and palpating the chest.
    a. If patients have an ICD and an Implanted Vascular Access Device (IVAD) in place,

these are placed on opposite sides of the chest. Always review patient chart to determine the location and types of devices.

7. Place the magnet over the ICD device as shown. A thin dressing (thin foam or gauze pad) may be placed between the magnet and the skin to prevent skin breakdown.

Image Credit MedMovie Image Reproduced with permission.





8. Mark skin with permanent marker to show boundaries for placement.
9. Clip or shave any excess chest hair to ensure magnet sits flush and tape will adhere.
10. Securely tape magnet over ICD device to ensure magnet does not move or fall off. It is recommended to use an "X" or box pattern when applying tape to ensure there is no migration of the magnet.

N.B. After application (depending on the device), there may be a beeping sound (this is normal and expected). Beeping may resolve after a few minutes or may occur intermittently throughout the time the magnet rests on the chest.

Deactivation Procedure Documentation

Document in the patient's medical record or chart in the home (if present) the following and other relevant information regarding deactivation of ICD:

1. Reason for deactivation and location the deactivation occurred.
2. Date and time of magnet application and any interventions related to magnet application and removal.
3. Discussion with the patient and caregivers, education provided and confirmation of consent.
4. Communication with other health care providers e.g., primary care practitioner, shift care nurses, other health care providers involved in patient care.

Care and Management

1. Monitor placement of magnet to ensure magnet does not become accidently displaced. Re-align

to skin markings if displaced.

Monitor the presence of the magnet regularly and with any change in patient position noting:

a. Confirm ICD deactivation magnet is in situ.
b. Assessment of skin integrity (remove magnet quickly, assess for any redness or signs of skin breakdown, replace magnet).
c. If there are signs of skin integrity breakdown, document interventions.
d. Ensure patient/caregiver questions are answered and any concerns are addressed.

2. Documentation should include:
    a. Location of magnet;
    b. Skin Integrity Assessment;
    c. Patient/caregiver education completed; and
    d. Any patient symptoms or concerns.
3. If the patient's prognosis changes, and they are expected to live longer than hours to short days, consider alternative options above such as clinic deactivation vs referral to RPCT for deactivation with a portable deprogrammer.
4. Determine who will be responsible for on-going care and management e.g., family / caregiver or shift care nurse/PSW and provide education regarding:
    a. Care and Management (as outlined above);
    b. When and how to contact team with any concerns; and
    c. Instructions for removal, safe handling and return of magnet.

Troubleshooting

1. Patient is Restless, concern magnet will not stay in place:
    a. Speak with most-responsible provider to consider medication adjustments to better manage restlessness at end-of-life;
    b. Secure magnet using sufficient tape, consider wrapping the magnet onto the chest using gauze; and
    c. Increase the frequency of magnet location checks to hourly.

2. Patient is diaphoretic, concern magnet will not stay in place:
    a. Assess and treat any reversible cause of diaphoresis (e.g. treating fever if present). Remove extra linens if patient is over heated;
    b. Consider running gauze across the chest to reduce moisture or using a product such as Drysol on the skin;

c. Secure magnet using sufficient tape, consider wrapping the magnet onto the chest using gauze. If wrapping with gauze tightly, consider placing a small, thin foam between the magnet and the chest to increase comfort; and

d. Increase the frequency of magnet location checks to hourly.

3. An audible alarm is heard when the magnet is applied:

    a. Some devices may produce an audible cue when magnet is applied, a faintly audible sound may occur in some cases.

    b. If a loud sound persists, try repositioning the magnet on the patient's chest.

    c. The MRP or family can reach out to the device clinic if they have concerns.

5. If the patient's condition improves, or the patient is living longer than expected with a magnet in place:

    a. Magnet deactivation is intended to be short-term.

    b. Reach out to Physician or Nurse Practitioner to suggest referral to RPCT for remote deactivation (refer to section above on remote deactivation referral process).

Post-Mortem

1. Remove magnet 30 minutes after death has occurred. Once 30 minutes has elapsed the ICD will no longer cause a shock.
2. Return magnet. These are reusable; follow IPAC procedures in accordance with organizational policy.
3. Notify the funeral home that patient has an ICD device. Ideally, the ICD should be explanted (removed) and discarded. There may be cases when an ICD is required to be removed, e.g., for further analysis, at the request of the family, or for cremation. Patients may be buried with an ICD. An ICD may explode if cremated.
4. If the magnet was not removed ask the funeral home to return the magnet to the appropriate location.

Glossary of Terms

Cardiac Resynchronization Device: Also sometimes called a biventricular pacemaker. An implanted device that delivers electrical impulses to the heart's lower chambers to help them pump blood more efficiently. This may have a pacemaker function only, a defibrillator function only, or both.

Caregiver(s): The term caregiver was used to describe who patients have identified as being important in their care e.g., family members, friends and informal caregivers.

Deactivation*:* The act of making the defibrillator function inactive. This term is applied globally and will be used in reference to magnet deactivation and deprogramming via an electronic device.
Deprogramming: The act of making the defibrillator function inactive using an electronic device.
Dextrocardia: a rare congenital condition where the heart is positioned on the right side of the chest instead of the left.
Implanted Cardioverter Defibrillator (ICD): a small, battery-powered device surgically placed under the skin to monitor the heart's rhythm and deliver electrical shocks to correct life-threatening fast heart rhythms, preventing sudden cardiac arrest.
Implanted Vascular Access Device: a small, under the skin disk with a raised center connected to a catheter tube that is placed in a major vein, often in the chest.
Pacemaker*:* a small, battery-powered device surgically placed under the skin to monitor the heart's rhythm and stimulate the heart muscle and regulate its contractions to keep heart rate above a preset minimum.
Substitute Decision Maker (SDM): The person who is legally authorized to make decisions on behalf of the patient who is unable to make those decisions for themselves.

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Appendix A: Resources

Patient/Family/Caregiver Resources

Heart and Stroke Foundation: When to Consider ICD Deactivation

Health Provider Resources

Cardiac Services BC Health Provider Resources Web Page: http://www.cardiacbc.ca/health-professionals/clinical-practice-resources/heart-failure

ICD information Sheet for Health Professionals http://www.cardiacbc.ca/Documents/ICD- Info-for-Professionals.pdf

CorHealth Ontario: ICD Deactivation – A Guide for Health Care Professionals
Implantable Cardioverter Defibrillator (ICD) Deactivation at End of Life (for acute)

Appendix B: How to Obtain and Safely Store a Medical Grade Magnet

Preferred Approach:
It is recommended that magnets be secured earlier in the patient's disease trajectory, to have on hand when the time arises that they need to be applied.

Storage:

The magnet can damage some electronic devices and should be stored at least 15 cm (six inches) from electronic devices, recordings, bank and credit cards, cordless and cellular telephones, computers, diskettes, calculators, watches, and clocks.

Urgent Access to Magnet:
Consider reaching out to the Regional Palliative Consultation Team or the University of Ottawa Heart Institute Device Clinic to request support in obtaining a magnet. RPCT 24/7 phone number 1-800-651-1139; UOHI Device Clinic phone number 613-696-7076.

Some community paramedic groups may carry a magnet for urgent drop off to patients in their home. Consider reaching out to your local paramedic group to determine magnet availability Find a Community Paramedic

Consider contacting a hospital, hospice or Long-Term Care home as they may have one home that may have one that can be borrowed.

Purchasing a Medical Grade ICD Magnet

It is recommended that all hospitals, hospices, Long-Term Care homes and their satellites purchase their own ICD magnet to have on hand. It is recommended that all staff be aware of the location where these devices are stored. Medical Grade ICD magnets may be purchased online via Medtronic or online via McKesson.

Appendix C: Sample letter for device deactivation

[Date]

Patient Name
DOB:
Address

RE: Discussion for Implantable Cardioverter Defibrillator (ICD) Deactivation

To whom it may concern,

I have discussed the following with the patient and their family:

- Turning off the ICD will not cause death
- In the event of a dangerous rapid heart rate turning off the ICD will no longer provide a potentially lifesaving therapy such as electric shock and anti-tachycardia pacing
- Turning off the device will not be painful, nor will its failure to function cause pain
- The patient can change their mind and have the ICD lifesaving therapy turned back on
- Shocks at the end of life can cause a painful death
- There is a plan of care to ensure a healthcare professional's contact information is available to the patient if they have new questions or concerns

Best regards.

[Signature]
[Provider name]
[Provider credentials]
Phone:
Fax:

Guidance Document Review and Contributors

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