Spring 2022

NSIR-RT BULLETIN

Welcome to the electronic bulletin of the National System for Incident Reporting - Radiation Treatment (NSIR-RT). This bulletin supports continuous learning from incident data through the presentation of data trends and case studies. It also provides system users with information on program developments and enhancements.

NSIR-RT UPDATES

CIHI has now completed its update of the NSIR-RT Minimum Data Set (MDS) document in both English and French. Upon completion of system testing and updates to MicroStrategy (i.e., the 'Analyze' tab of the NSIR web-application), MDS system changes were fully implemented by February 17, 2022. Updates include enhancements to existing coding values of current data elements (i.e., Body Region(s) Treated, Immediate Ameliorating Actions and Radiation Treatment Technique(s)), as well as new coding values and clarifications on coding value labels and definitions.

These updates were based on feedback from the NSIR-RT Advisory Committee and the radiation therapy community and are expected to have a positive impact on data quality.

French translation of the NSIR-RT system was implemented on April 13, 2022. In addition to French translation, the update includes corrections to coding values of current data elements (i.e., Radiation Treatment Technique(s)) and MicroStrategy bug fixes. These fixes included removal of duplicate entries within MicroStrategy report filters, and 'retiring' outdated coding values.

This update aims to improve system accessibility and support uptake of radiation treatment incident reporting across Canada.

To access the English version of the 2021 NSIR-RT Minimum Data Set:

- Log in to the NSIR-RT web application
- Select the 'Help' menu at the top-right of the screen (see below)

- This will open a new window. Click on the link titled 'NSIR-RT MDS' and you will be directed to the English version of the 2021 NSIR-RT Minimum Data Set

To access the French version of the 2021 NSIR-RT Minimum Data Set:

- Log in to the NSIR-RT web application
- If the NSIR-RT web application is not already set to French, change the language to French by selecting the 'Français' button at the top-right of the screen
- Then, select the 'Aide' menu at the top-right of the screen (see below)

- This will open a new window. Click on the link titled 'Fichier minimal du SNDAI-RT' and you will be directed to the French version of the 2021 NSIR-RT Minimum Data Set.

ABOUT CAPCA

The Canadian Association of Provincial Cancer Agencies (CAPCA) works to improve cancer control across Canada. CAPCA envisions Canadian cancer control systems that are collaborative, patient-centered, and high performing by international standards.

CIHI CAPCA CPQR Canadian Partnership for Quality Radiotherapy PCQR Partenariat canadien pour la qualité en radiothérapie

Stories from Users

Radiation Treatment for Patients with Implanted Medical Devices

by Brian Liszewski, M.R.T.(T.), BSc., and Michelle Nielsen, FCCPM

Advances in medical technology are driving the integration of medical devices that support management of chronic health conditions, including cardiac implantable electronic devices (CIED), glucose monitors, cochlear implants, and deep brain stimulators to name a few. Today there are approximately 120,000 patients living with CIEDs in Canada; approximately 25,000 patients receive pacemakers and 7000 receive implantable cardioverter defibrillator (ICD) implants yearly (1).

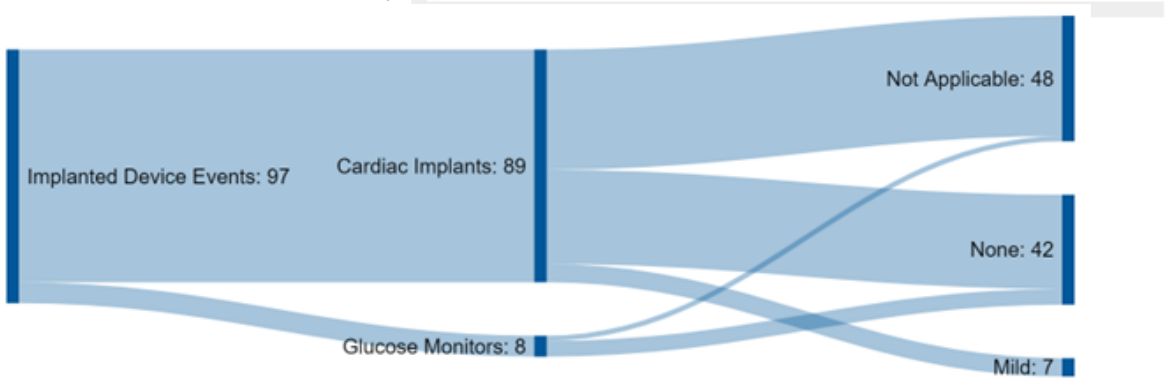
With the overall rise in prevalence of medical devices, more radiotherapy patients are entering the treatment system who also have medical implants. This has led to a number of considerations with respect to radiation exposure to the implant device over a course of radiation treatment.

To minimize possible negative effects on patient care and avoid potential corruption of implanted medical devices from exposure to radiation/electromagnetic interference, it is important to heighten awareness and provide points of consideration for clinical practice.

To inform guidance, we consulted the NSIR-RT database for reported incidents involving implanted devices. Using the implant types described above, incident reports that spanned five years of data were binned into two overarching events: cardiac implants and glucose monitors.

Figure 1 describes the incidence of implanted device reports and their classification based on overall severity.

Figure 1. Implanted Device Frequency and Overall Impact.



Of the events identifying problem types associated with implanted devices, 14 distinct event types were identified (see Table 1). Problem types such as “Radiation therapy scheduling error” and “Inadequate coordination of combined modality care” were used to capture events regarding coordination with arrhythmia services.

Other problem types were associated with the patient's medical condition or unplanned dose to the implant. Most notably 64% of events were classified as “Other”, identifying an opportunity for more consistent event classification.

Largely, these events yielded no significant clinical impact on the patients. Events resulting in mild harm to the patient were predominantly attributed to unplanned exposure of the implanted device, but with no acute negative impact on the patient.

Radiation treatment programs are encouraged to review definitions within the minimum dataset to guide the classification of implant- related events (See 'NSIR-RT Updates' above for instructions to access the 2021 NSIR-RT Minimum Data Set).

Stories from Users

Table 1. Implanted Device Problem Type Classifications.

	Problem Type	Count
1	Assorted documentation problem types	6
2	Inappropriate or poorly informed decision to treat or plan	2
3	Interventional procedure error (Retired value)	3
4	Treatment plan (isodose distribution) unacceptable	3
5	Excess imaging dose	4
6	Fall or other patient injury or medical condition	5
7	Inadequate coordination of combined modality care	5
8	Radiation therapy scheduling error	6
9	Other	60

Considering the NSIR-RT information, the following considerations for clinical practice are derived from an evidentiary base and a thematic review of current CIED policies across integrated cancer programs.

Implantable Electronic Device Considerations

The following should be considered in the development of institution-specific policies and procedures:

- **Requirements**: Programs should have implanted device policies in place as per Accreditation Canada Cancer Care Standards (2) and CPQR Key Quality Indicators (3).
- **Responsibility**: Identification of ICD/Pacemaker is typically done by radiation oncologist at consult or CT simulation.
- **Medical Device Notification**: The radiation oncology/radiation therapy department should contact the appropriate department for consultation (e.g., CIED – cardiac clinic, Glucose Monitors – Endocrinology) for further monitoring or intervention as necessary.
- **Documentation**: Copies of the implanted device information including vendor and model should be documented in the Radiation Oncology Information System/Electronic Medical Record and flags enabled where possible.
- **Monitoring**: Monitoring of the device over the course of radiation treatment is dependent upon recommendations from cardiac clinic, manufacturer, and risk to device. The frequency varies with treatment modality, dose, device location and patient dependence.
- **Simulation Considerations and Scan Limits**: Borders for inclusion and exclusion vary superiorly from above diaphragm to inferiorly below iliac crests. The scan limit should be expanded up to 15 cm from the standard borders or a measurement provided from the most superior/inferior CT scan slice. With measures of 5 - 15 cm from the treatment site or inclusion of anatomy only required for planning purposes.
- **Planning Considerations**: No direct beams should pass through the device and ideally, the beam edge should be at minimum 5 cm from the device. Device accumulated dose assessment should be completed with imaging dose and reviewed by the radiation oncologist.
- **Other Considerations**: Urgent cases, requiring immediate treatment that precludes the opportunity for implant assessment, will have follow-up with cardiac services as soon as reasonably achievable.

Although the considerations described above were developed from a review of CIED protocols (4), as the data from NSIR-RT shows, there are new implanted devices for which radiation treatment programs can develop future guidelines applying relevant considerations from the above list.

Stories from Users

References

1. Kelly SE, Campbell D, Duhn LJ, Giddens K, Gillis AM, AbdelWahab A, Nault I, Raj SR, Lockwood E, Basta J, Doucette S, Wells GA, Parkash R. Remote Monitoring of Cardiovascular Implantable Electronic Devices in Canada: Survey of Patients and Device Health Care Professionals. CJC Open. 2020 Nov 20;3(4):391-399.
2. Accreditation Canada. Cancer Care Standards (Ver. 14)16.4; Radiotherapy only: There are policies and procedures to identify and monitor clients with implanted electronic devices during radiotherapy; 2019.
3. Canadian Partnership for Quality Radiotherapy. (2019). Quality Assurance Guidelines for Canadian Radiation Treatment Programs.
4. Miften, M., Mihailidis, D., Kry, S. K., Reft, C., Esquivel, C., Farr, J., Followill, D., Hurkmans, C., Gayou, O., Gossman, M., Mahesh, M., Popple, R., Prisciandaro, J., & Wilkinson, J. (2019). Management of Radiotherapy Patients with Implanted Cardiac Pacemakers and Defibrillators: A Report of the AAPM TG-203. Medical Physics. 2019 Dec;46(12): e757-e788.

NSIR-RT ADVISORY COMMITTEE UPDATES

The NSIR-RT Advisory Committee focus in 2022 is ensuring the NSIR-RT is meeting the current and future needs of the Canadian radiation treatment community and ultimately improving patient safety.

Now under the purview of CAPCA, the NSIR-RT Advisory Committee will continue its quarterly publication of this Bulletin and will share NSIR-RT user experiences to promote its use, learn from incident reporting data trends and support updates that enhance its useability.

To further engage the radiation treatment community, the NSIR-RT Advisory Committee and CAPCA are interested in convening a community of practice, hosting ad hoc presentations, discussion groups, webinars, etc. to explore issues relating to incident reporting and learning, and related process changes to improve quality and safety in radiation treatment.

If you are interested in learning more, connect with Staci Kentish, CAPCA Program Coordinator (skentish@capca.ca).

Continuing Education

CPQR's *Radiation Treatment Incident Investigation Independent Learning Course* continues to be available on the CPQR website **free of charge**. The independent learning program will teach participants how to effectively investigate local incidents using the Canadian Patient Safety Institute (CPSI) guidelines, identify trends through local and pan-Canadian incident analysis and inform programmatic change with the aim of improving overall patient care and outcomes.

Watch the course introduction for more information here.

NSIR-RT BY THE NUMBERS

2015 - May 2022

Incidents Submitted	6,413
Actual Incidents	4,198

Overall Severity

None	3,205
Mild	917
Moderate	68
Severe	8

CIHI

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