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- American Association of Physicists in Medicine<sup>1</sup>
- American Society for Radiation Oncology<sup>2</sup>
- European Society for Radiotherapy and Oncology<sup>3</sup>
- International Atomic Energy Agency<sup>4</sup>
- World Health Organization<sup>5</sup>

## Preface

### Background information

The National System for Incident Reporting — Radiation Treatment (NSIR-RT) was developed through a partnership between the Canadian Institute for Health Information and the Canadian Partnership for Quality Radiotherapy. NSIR-RT enables sharing of and learning from radiation treatment incidents to improve patient safety.

The **Canadian Partnership for Quality Radiotherapy (CPQR)** was created in 2010 in response to a growing demand for a more harmonized approach to radiation treatment quality and safety. Its mission is to support and promote the universal availability of high-quality and safe radiotherapy for all Canadians through system performance initiatives aimed at improving quality and mitigating risk.

The **Canadian Institute for Health Information (CIHI)** is an independent, not-for-profit organization that provides essential information on Canada's health systems and the health of Canadians. CIHI provides comparable and actionable data and information that are used to accelerate improvements in health care, health system performance and population health across Canada. Stakeholders use CIHI's broad range of health system databases, measurements and standards, together with evidence-based reports and analyses, in their decision-making processes. CIHI protects the privacy of Canadians by ensuring the confidentiality and integrity of the health care information it provides.

## Privacy and confidentiality

CIHI's National System for Incident Reporting (NSIR) has undergone a privacy impact assessment, with the main objective of examining the privacy, confidentiality and security risks associated with the system. Please visit the Privacy and Security section of our website at [www.cihi.ca](http://www.cihi.ca) for more information and to download the NSIR privacy impact assessment.

## Introduction

### Incident management and the National System for Incident Reporting

A key element of continuous quality improvement, incident reporting improves patient safety by preventing incident recurrence or propagation, identifying and correcting system vulnerabilities and promoting a culture of transparency and sharing. Because of the unique challenges for managing radiation treatment incidents, there is a need for incident management specific to radiation treatment that supports local quality improvement activities and learning across programs and jurisdictions.

Incident analysis and learning is complex and involves many steps, often with engagement of individual care providers, program leadership, patients and families. There are many national and international guidelines that address the investigation and management of medical or radiation treatment incidents, including the World Health Organization's *Guidelines for Adverse Event Reporting and Learning Systems*,<sup>6</sup> the Canadian Patient Safety Institute's *Canadian Incident Analysis Framework*<sup>7</sup> and the Alberta Heritage Foundation for Medical Research's *Reference Guide for Learning From Incidents in Radiation Treatment*.<sup>8</sup> Most Canadian radiation treatment programs have protocols for incident investigation and management based on these recommendations already in place. These vary somewhat from program to program depending on organization structure and resource availability. NSIR-RT is an online, web-based reporting and analysis system that is intended to capitalize on and strengthen existing infrastructure not by dictating how incidents should be investigated but rather by providing a coordinated mechanism for sharing the results of these investigations.<sup>9</sup>

## The minimum data set

The NSIR-RT Minimum Data Set (MDS) is intended to provide consistent, essential information to a broad range of partners and stakeholders who have key roles in the accurate coding and reporting of radiation therapy incidents. The purposes of the MDS are to

- Identify and provide a description of the specific data elements used to gather information on radiation therapy incidents;
- Provide a rationale for the inclusion of each data element;
- Codify the values that categorize the data element (where applicable); and
- Provide a guide for the use and collection of the data element.

The NSIR-RT MDS includes the following information domains:

- **Incident Impact** — Characterization of the incident (actual/near miss/programmatic hazard) and effects (acute, dosimetric and latent) of the incident
- **Incident Discovery** — The discovery of the incident (where and when the incident was discovered, and by whom)
- **Patient Characteristics** — Demographic and disease characteristics of the patient
- **Incident Details** — Specific incident details such as process, problem, contributing factors and number of patients affected
- **Treatment Delivery** — Specific details regarding the treatment delivery, including the radiation treatment technique, dose and fraction prescription, technologies and equipment used, site treated and treatment intent
- **Incident Investigation** — Information pertaining to actions taken to ameliorate the incident outcome, as well as pertaining to safety barriers and actions planned to reduce the risk of incident recurrence

# How to use this manual

This manual is designed to be a resource for the accurate and consistent coding of radiation treatment incident reports submitted to NSIR-RT. There are 2 sections and appendices:

**National System for Incident Reporting — Radiation Treatment** — This section provides an overview of the project scope and uses of NSIR-RT data.

**Guidelines for coding and interpretation** — This section provides detailed coding and interpretation guidelines for risk management and quality improvement staff involved in the assessment and coding of data and submission to NSIR-RT. These guidelines are also required for the accurate interpretation of data analysis and reports derived from NSIR-RT.

**Appendices** — Appendix A provides a table listing the mandatory and optional elements of the taxonomy. Appendix B provides the NSIR-RT Treatment Process Map.

# Contact information

For NSIR-RT support, please send an email to [nsir@cihi.ca](mailto:nsir@cihi.ca).

# National System for Incident Reporting — Radiation Treatment

## Scope of NSIR-RT

NSIR-RT is not an omnibus management system; rather it is intended to facilitate reporting and analysis of incidents specific to radiation therapy. In broad terms, the system parameters have been defined as follows:

1. **Settings** — The information system includes radiation treatment incident data from participating radiation treatment centres across Canada.
2. **Types of data reporters** — Radiation treatment incidents within Canadian radiation treatment centres are captured and reported by registered NSIR-RT users who are responsible for patient safety related to radiation treatment incidents within the centre.
3. **Types of radiation treatment incidents** — NSIR-RT classifies incidents as 1 of 3 types: actual incidents, near misses or programmatic hazards.

NSIR-RT includes actual incidents and near misses related to patient assessments, imaging, treatment planning and delivery, pre-treatment review and verification, quality management and post-treatment completion. The reporting of radiation treatment incidents or environmental states that have the potential to cause harm (near misses and programmatic hazards, respectively) is integral to facilitating the identification of processes that may require adjustments in order to correct potentially hazardous situations or processes and to prevent serious adverse outcomes.

## Impact of the radiation treatment incident

Radiation treatment incidents that reach the patient may be associated with acute medical harm that is evident immediately or with delayed harm that manifests months or years after the event. Delayed harm may include tumour recurrence or normal organ and tissue injury as a result of the incident. An effective incident-reporting system for radiation treatment needs to capture both types of harm.

The acute medical harm scale in NSIR-RT was adapted with permission from the World Health Organization's final technical report for the *Conceptual Framework for the International Classification for Patient Safety*.<sup>5</sup> Acute harm is categorized as no harm, mild, moderate, severe and death, as defined in Section 1.3.

A dosimetric impact scale, reflecting the degree of dosimetric deviation relative to the intended doses to the tumour or normal organs and tissues, is defined in Section 1.4 of Guidelines for coding and interpretation. The scale was adopted as a surrogate to measure the late consequences of a radiation treatment incident.

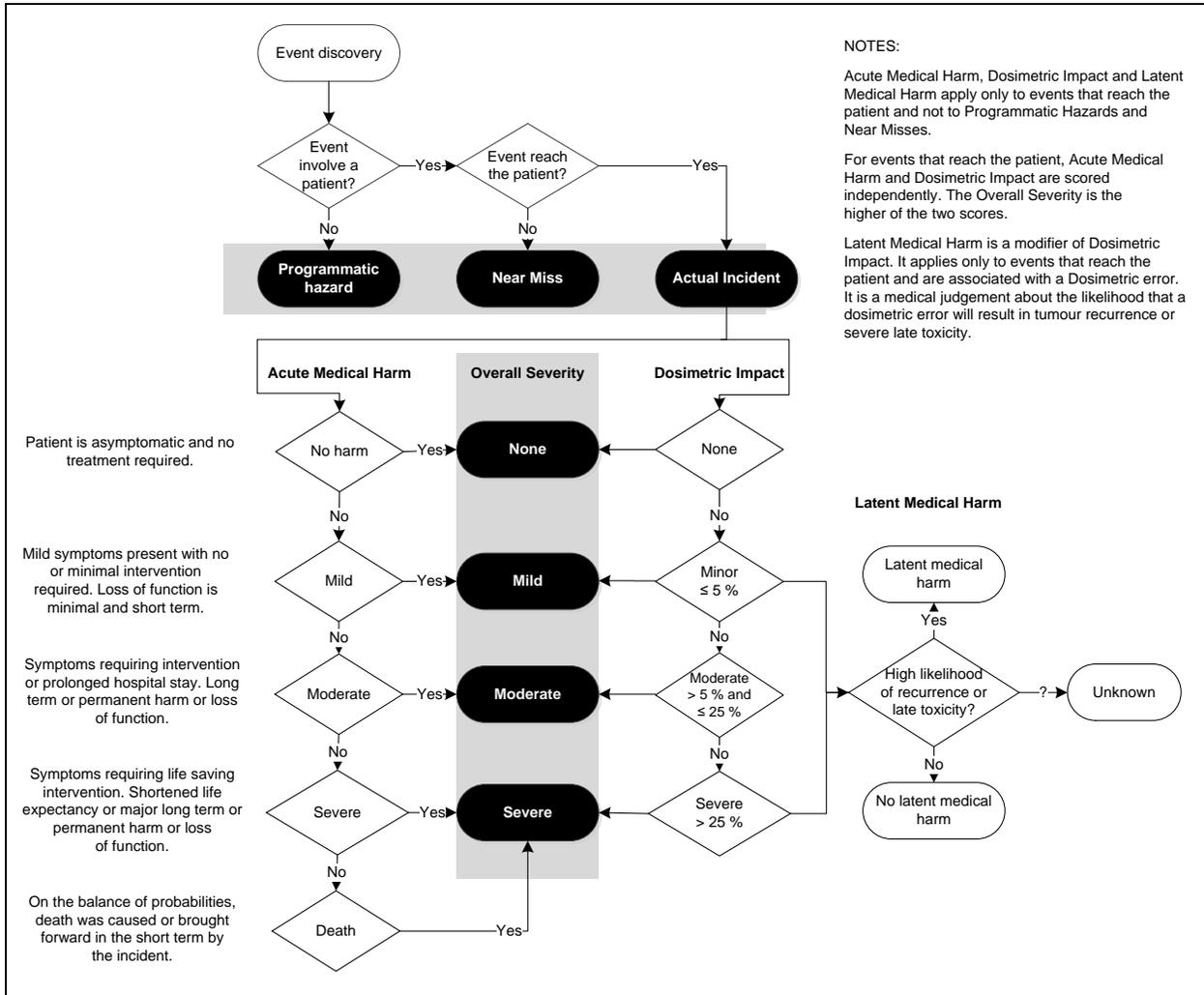
Overall severity is derived from Acute Medical Harm and Dosimetric Impact. Overall severity is assigned the higher score of either Acute Medical Harm or Dosimetric Impact. When Acute Medical Harm is death, the overall severity assignment will be severe.

It was recognized that even a severe dosimetric error, while indicative of a programmatic deficiency requiring investigation, may not necessarily have medical consequences depending on a variety of patient- and treatment-related factors. To address this concern, the concept of *latent medical harm* — a medical judgment about whether or not a dosimetric error is likely to result in tumour recurrence or normal tissue injury — has been included in Section 1.5.<sup>9</sup>

Acute Medical Harm, Dosimetric Impact and Latent Medical Harm are applicable only to incidents that reach the patient (actual incidents) but not to near misses or programmatic hazards.

The NSIR-RT Algorithm for Categorizing Impact of Radiation Treatment Incidents, presented below, is a tool designed to assist the user in the selection of correct values related to impact.

**Figure 1** NSIR-RT Algorithm for Categorizing Impact of Radiation Treatment Incidents



# Guidelines for coding and interpretation

This section provides a detailed description of each data element, including

- Rationale for each data domain
- Data element definitions
- Coding responses with definitions
- Coding guidelines

## 1 Incident Impact

### Rationale

Information provided will

- Present a detailed description of the incident. The description should adequately summarize the incident and the sequence of events. The information provided in the description may be used to assist the investigation and the incident coding (particularly in those centres where incidents are investigated and characterized by someone other than the reporter);
- Identify the incident type — an actual incident, a near miss or a programmatic hazard; and
- Identify the severity and/or degree of harm.

### List of data elements

- 1.1 Incident Description
- 1.2 Type of Radiation Treatment Incident
- 1.3 Acute Medical Harm
- 1.4 Dosimetric Impact
- 1.5 Latent Medical Harm

### 1.1 Incident Description

#### Definition

A detailed, factual description of what happened during the radiation treatment incident. Text may include relevant details such as equipment involved, provider roles involved, patient condition, circumstances leading up to the incident, sequence of events, immediate outcome, patient history, physical characteristics and test results.

## Coding

Text

### Guide for use

- Mandatory when Type of Radiation Treatment Incident is a programmatic hazard, a near miss or an actual incident.
- Open-text data element.
- Any text submitted to CIHI must not include names or specific details that could lead to the identification of patients, health care providers or centres involved in the radiation treatment incident.

## 1.2 Type of Radiation Treatment Incident

### Definition

Classification of an RT incident that indicates whether an incident occurred and, if an incident did occur, whether it reached the patient.

### Coding values

Programmatic hazard	A hazard related to the radiation treatment program that does not involve a patient but has the potential to affect patients if not corrected.
Near miss	A patient safety event that is caught by chance or by 1 or more safety barriers before reaching the patient.
Actual incident	A patient safety event that is detected after reaching the patient.

### Guide for use

- Mandatory when Type of Radiation Treatment Incident is a programmatic hazard, a near miss or an actual incident.
- A delay reaches the patient and is considered an actual incident.
- See [Figure 1: NSIR-RT Algorithm for Categorizing Impact of Radiation Treatment Incidents](#).
- Note about data structure: Type of Radiation Treatment Incident is a construct created to guide users in classifying incidents when entering incidents directly into NSIR-RT. Within the data structure, it is part of a single data element that includes the values for Acute Medical Harm listed in Section 1.3 below. This data structure is consistent with the World Health Organization (WHO) harm classification and mirrors the data structure for medication incidents reported to NSIR. For those who are mapping data elements between locally used systems and NSIR-RT, please consult the NSIR data specifications documents available from CIHI.

## 1.3 Acute Medical Harm

### Definition

A description of the severity of the health effects evident within 24 hours of a radiation incident.

### Coding values

No harm	Patient is asymptomatic and no treatment is required.
Mild	Symptoms, if present, are mild; no or minimal intervention (observation, investigation, minor treatment) is required; harm or loss of function is minimal or intermediate but short term.
Moderate	Patient is symptomatic, requiring intervention (additional treatment or operative procedure) or a prolonged hospital stay; long-term or permanent harm or loss of function.
Severe	Patient is symptomatic, requiring life-saving intervention or a major surgical/medical intervention; shortened life expectancy or major long-term or permanent harm or loss of function.
Death	On the balance of probabilities, death was caused or brought forward in the short term by the incident.

### Guide for use

- Mandatory when Type of Radiation Treatment Incident is an actual incident.
- Not applicable when Type of Radiation Treatment Incident is a programmatic hazard or a near miss.
- Single-select data element.
- See [Figure 1: NSIR-RT Algorithm for Categorizing Impact of Radiation Treatment Incidents](#).

## 1.4 Dosimetric Impact

### Definition

Relative to the intended doses, the tumour underdose or organ-at-risk (OAR) overdose over the course of treatment.

### Coding values

None	When an incident reaches the patient but does not involve a dosimetric delivery error.
Minor	≤5% tumour underdose or OAR overdose, relative to the intended doses to these structures over the course of treatment.

Moderate	>5% and ≤25% tumour underdose or OAR overdose, relative to the intended doses to these structures over the course of treatment.
Severe	>25% tumour underdose or OAR overdose, relative to the intended doses to these structures over the course of treatment.

### Guide for use

- Mandatory when Type of Radiation Treatment Incident is an actual incident.
- Not applicable when Type of Radiation Treatment Incident is a programmatic hazard or a near miss.
- Single-select data element.
- See [Figure 1: NSIR-RT Algorithm for Categorizing Impact of Radiation Treatment Incidents](#).

## 1.5 Latent Medical Harm

### Definition

The likelihood that the incident is associated with the development of evident late morbidity or reduced probability of cure.

### Coding values

On the balance of probabilities, is it likely that this incident is associated with the development of significant late medical harm?

Yes On the balance of probabilities, the incident is likely to be associated with the development of significant late medical harm.

No On the balance of probabilities, the incident is unlikely to be associated with the development of significant late medical harm.

Do not know

### Guide for use

- Mandatory for incidents that are assessed as having a minor, moderate or severe dosimetric impact except when Acute Medical Harm is death. In that instance, Latent Medical Harm is not applicable.
- Not applicable when Type of Radiation Treatment Incident is a programmatic hazard or a near miss or when Dosimetric Impact is none.
- Single-select data element.
- See [Figure 1: NSIR-RT Algorithm for Categorizing Impact of Radiation Treatment Incidents](#).

## 2 Incident Discovery

### Information need

The discovery of the incident (time, place, roles of health care providers involved and who detected the incident).

### Rationale

Information provided will

- Support root cause analysis and follow-up within reporting centres;
- Assist in establishing patterns of similar incidents on any particular date or in any particular date range, and at any particular time or in any particular time range; and
- Support the development of health care provider training/education and quality-assurance programs that lead to improvements in the planning and delivery of radiation treatment.

### List of data elements

- 2.1 Functional Work Area
- 2.2 Date Incident Was Detected
- 2.3 Date Incident Occurred
- 2.4 Time Incident Was Detected
- 2.5 Time Period Incident Was Detected
- 2.6 Time Incident Occurred
- 2.7 Time Period Incident Occurred
- 2.8 Health Care Provider(s) and/or Other Individual(s) Who Detected the Incident
- 2.9 Health Care Provider(s) and/or Other Individual(s) Involved in the Incident

### 2.1 Functional Work Area

#### Definition

The functional work area(s) within the centre in which the incident occurred.

#### Coding values

Coding values to be configured by individual treatment centres to reflect local facilities and program organization.

## **Guide for use**

- Mandatory when Type of Radiation Treatment Incident is a programmatic hazard, a near miss or an actual incident.
- Site-specific ward(s)/area(s) must be entered by the centre before use.

## **2.2 Date Incident Was Detected**

### **Definition**

The day, month and year the incident was detected.

### **Coding**

YYYYMMDD

### **Guide for use**

- Mandatory when Type of Radiation Treatment Incident is a programmatic hazard, a near miss or an actual incident.
- Input year, month and day.

## **2.3 Date Incident Occurred**

### **Definition**

The day, month and year the incident occurred.

### **Coding**

YYYYMMDD

### **Guide for use**

- Optional when Type of Radiation Treatment Incident is a near miss or an actual incident.
- Not applicable when Type of Radiation Treatment Incident is a programmatic hazard.
- Input year, month and day.

## 2.4 Time Incident Was Detected

### Definition

The actual time (24-hour clock) at which the incident was detected.

### Coding

HH:MM

### Guide for use

- Either Time Incident Was Detected or Time Period Incident Was Detected is mandatory when Type of Radiation Treatment Incident is a programmatic hazard, a near miss or an actual incident.
- Specify the actual time (24-hour clock) at which the incident was detected.

## 2.5 Time Period Incident Was Detected

### Definition

The time period during which the incident was detected.

### Coding values

00:00–03:59

04:00–07:59

08:00–11:59

12:00–15:59

16:00–19:59

20:00–23:59

Do not know

### Guide for use

- Either Time Incident Was Detected or Time Period Incident Was Detected is mandatory when Type of Radiation Treatment Incident is a programmatic hazard, a near miss or an actual incident.
- Select the time period during which the incident was detected.

## 2.6 Time Incident Occurred

### Definition

The actual time (24-hour clock) at which the incident occurred.

### Coding

HH:MM

### Guide for use

- Either Time Incident Occurred or Time Period Incident Occurred is optional when Type of Radiation Treatment Incident is a near miss or an actual incident.
- Not applicable when Type of Radiation Treatment Incident is a programmatic hazard.
- Specify the actual time (24-hour clock) at which the incident occurred.

## 2.7 Time Period Incident Occurred

### Definition

The time period during which the incident occurred.

### Coding values

00:00–03:59

04:00–07:59

08:00–11:59

12:00–15:59

16:00–19:59

20:00–23:59

Do not know

### Guide for use

- Either Time Incident Occurred or Time Period Incident Occurred is optional when Type of Radiation Treatment Incident is a near miss or an actual incident.
- Not applicable when Type of Radiation Treatment Incident is a programmatic hazard.
- Select the time period during which the incident occurred.

## **2.8 Health Care Provider(s) and/or Other Individual(s) Who Detected the Incident**

### **Definition**

The health care provider(s) and/or other individuals who were involved in the discovery of the incident.

### **Coding values**

Radiation therapist

Radiation therapy team supervisor

Treatment planner or dosimetrist

Medical physicist

Radiation oncologist

Technical maintenance staff

Nursing staff

Physician assistant

Resident or fellow

Student or other trainee

Administrator

Clerical staff

Patient

Family member

Other

Do not know

### **Guide for use**

- Optional when Type of Radiation Treatment Incident is a programmatic hazard, a near miss or an actual incident.
- Multiple-select data elements.

## **2.9 Health Care Provider(s) and/or Other Individual(s) Involved in the Incident**

### **Definition**

The health care provider(s) and/or other individuals who were involved in the incident. This excludes individuals involved only in the investigation and/or in the follow-up of the incident.

### **Coding values**

Radiation therapist

Radiation therapy team supervisor

Treatment planner or dosimetrist

Medical physicist

Radiation oncologist

Technical maintenance staff

Nursing staff

Physician assistant

Resident or fellow

Student or other trainee

Administrator

Clerical staff

Patient

Family member

Other

Do not know

### **Guide for use**

- Optional when Type of Radiation Treatment Incident is a programmatic hazard, a near miss or an actual incident.
- Multiple-select data elements.

## 3 Patient Characteristics

### Information need

Demographic characteristics of the patient associated with an incident.

### Rationale

Information provided will

- Offer basic information about the characteristics of the patient population;
- Gather information about the age of the patient associated with an incident and make it possible to identify populations that may be at risk for specific types of radiation treatment incidents; and
- Facilitate the identification of prevention strategies for distinct populations.

### List of data elements

- 3.1 Patient Month of Birth
- 3.2 Patient Year of Birth
- 3.3 Patient Gender
- 3.4 Diagnosis Relevant to Treatment

#### 3.1 Patient Month of Birth

##### Definition

The month of birth of the patient (index patient if more than one affected) involved in the actual incident or near miss. Age (in years) will be calculated from the year of birth (see Section 3.2) and month of birth to the month and year in which the incident was detected (see Section 2.2).

##### Coding

Month of Birth

MM

##### Guide for use

- Optional when Type of Radiation Treatment Incident is a near miss or an actual incident.
- Not applicable when Type of Radiation Treatment Incident is a programmatic hazard.

## 3.2 Patient Year of Birth

### Definition

The calendar year of birth of the patient (index patient if more than one affected) involved in the actual incident or near miss. Age (in years) will be calculated from the year of birth and month of birth (see Section 3.1) to the month and year in which the incident was detected (see Section 2.2).

### Coding

Year of Birth

YYYY

### Guide for use

- Optional when Type of Radiation Treatment Incident is a near miss or an actual incident.
- Not applicable when Type of Radiation Treatment Incident is a programmatic hazard.
- Permissible range is 130 years prior to the Date Incident Was Detected.

## 3.3 Patient Gender

### Definition

For the patient involved (index patient if more than one affected), the socially constructed roles, behaviours, activities and attributes that a given society considers appropriate for men and women.

### Coding values

Male

Female

Undifferentiated — the gender of a person could not be uniquely defined as male or female

Do not know

### Guide for use

- Mandatory when Type of Radiation Treatment Incident is an actual incident.
- Optional when Type of Radiation Treatment Incident is a near miss.
- Not applicable when Type of Radiation Treatment Incident is a programmatic hazard.

## 3.4 Diagnosis Relevant to Treatment

### Definition

The current cancer diagnosis that the patient (index patient if more than one affected) was being treated for at the time the incident occurred.

### Coding values

Breast cancer

Central nervous system tumours

Gastrointestinal cancer

Genitourinary cancer

Gynecological cancer

Head and neck cancer

Lymphoma or leukemia

Melanoma/non-melanoma skin cancer

Metastatic disease

Sarcoma

Thoracic malignancy

Benign

Other

### Guide for use

- Mandatory when Type of Radiation Treatment Incident is an actual incident.
- Optional when Type of Radiation Treatment Incident is a near miss.
- Not applicable when Type of Radiation Treatment Incident is a programmatic hazard.
- Single-select data element.

## 4 Incident Details

### Information need

The reporting of specific radiation treatment incident details will inform root cause analysis, risk management and quality improvement activities and promote shared learning across radiation treatment centres.

### Rationale

A minimum number of relevant details are required to provide the data necessary to disseminate timely and targeted information designed to reduce the risk of radiation treatment incidents.

Information provided will

- Enable centres to identify and track problem-prone areas within the sequential processes of the radiation treatment system and focus quality assurance and prevention activities on higher-risk areas;
- Focus radiation treatment management and incident prevention efforts by identifying the most common problems of radiation treatment incidents;
- Assist centres in identifying organizational processes and care-management protocols that contribute to radiation treatment incidents;
- Support the identification of underlying causes and factors that give rise to radiation treatment incidents and the development of system-based strategies for improving radiation treatment quality and safety; and
- Support the assessment of the effectiveness of prevention efforts over time.

### List of data elements

- 4.1 Process Step Where Incident Occurred
- 4.2 Process Step Where Incident Was Detected
- 4.3 Problem Type
- 4.4 Contributing Factors
- 4.5 Number of Patients Affected

## 4.1 Process Step Where Incident Occurred

### Definition

The point during the patient's trajectory at which the incident originated.

### Coding values

Patient medical consultation and physician assessment — collection and review of all necessary information to make a decision about the use of radiation treatment and to plan and schedule treatment. This may include a relevant patient history and physical examination, relevant diagnostic and staging tests, consultation/discussion with other relevant medical specialists (surgery, medical oncology, palliative care, pathology, medical imaging) and discussion at multidisciplinary cancer conference.

Radiation treatment prescription scheduling — includes the decision to treat, development of the proposed radiation therapy prescription (dose, fractionation, site, laterality), technique and scheduling.

Interventional procedure for planning and/or delivery — interventional procedures to facilitate radiation treatment planning or treatment delivery, including but not limited to applicator insertion for brachytherapy procedures, fiducial marker insertion for external beam treatment and the application of stereotactic frames for external beam treatment.

Imaging for treatment planning — includes setup instructions, tattooing and setting CT reference.

Contouring and planning — includes contouring of target structures and OARs, generation of a treatment plan including an isodose distribution, treatment plan approval and transfer of plan data and setup instructions to the radiation oncology information system (ROIS).

Treatment delivery — includes patient positioning, on-treatment megavoltage flat-panel imaging, on-treatment volumetric CT or MR imaging, image guidance procedures such as couch translations, call back, time-out and treatment delivery.

Post-treatment completion — includes patient discharge, follow-up care planning and scheduling, and final chart check.

Other

### Guide for use

- Mandatory when Type of Radiation Treatment Incident is a near miss or an actual incident.
- Not applicable when Type of Radiation Treatment Incident is a programmatic hazard.
- Single-select data element.
- See Appendix B for the NSIR-RT Treatment Process Map.

## 4.2 Process Step Where Incident Was Detected

### Definition

The point during the patient's trajectory at which the incident was discovered.

### Coding values

Patient medical consultation and physician assessment — collection and review of all necessary information to make a decision about the use of radiation treatment and to plan and schedule treatment. This may include a relevant patient history and physical examination, relevant diagnostic and staging tests, consultation/discussion with other relevant medical specialists (surgery, medical oncology, palliative care, pathology, medical imaging) and discussion at multidisciplinary cancer conference.

Radiation treatment prescription scheduling — includes the decision to treat, development of the proposed radiation therapy prescription (dose, fractionation, site, laterality), technique and scheduling.

Interventional procedure for planning and/or delivery — interventional procedures to facilitate radiation treatment planning or treatment delivery, including but not limited to applicator insertion for brachytherapy procedures, fiducial marker insertion for external beam treatment and the application of stereotactic frames for external beam treatment.

Imaging for treatment planning — includes setup instructions, tattooing and setting CT reference.

Contouring and planning — includes contouring of target structures and OARs, generation of a treatment plan including an isodose distribution, treatment plan approval and transfer of plan data and setup instructions to the ROIS.

Pre-treatment quality assurance — includes physician peer review, physics plan check and patient-specific quality control checks.

Treatment delivery — includes patient positioning, on-treatment megavoltage flat-panel imaging, on-treatment volumetric CT or MR imaging, image guidance procedures such as couch translations, call back, timeout and treatment delivery.

On-treatment quality assurance — includes physician weekly clinical review, routine chart checks and audits.

Post-treatment completion — includes patient discharge, follow-up care planning and scheduling, and final chart check.

Other

## Guide for use

- Mandatory when Type of Radiation Treatment Incident is a programmatic hazard, a near miss or an actual incident.
- *Pre-treatment quality assurance* and *on-treatment quality assurance* are not applicable for Process Step Where Incident Occurred.
- Single-select data element.
- See Appendix B for the NSIR-RT Treatment Process Map.

## 4.3 Problem Type

### Definition

Problem Type categorizes the incident from the perspective of how it directly affected the patient or, in the case of a near miss, how it would have affected the patient had it not been detected by chance or by 1 or more safety barriers.

### Coding values

Inappropriate or poorly informed decision to treat or plan — inappropriate decision to treat with radiotherapy or unavailable/incomplete information necessary for medical decision-making or radiation treatment planning, including an inadequate patient history and physical examination, inadequate or incomplete pathology report or staging investigations, lack of appropriate interdisciplinary medical consultation or lack of discussion at multidisciplinary cancer conference.

Fall or other patient injury or medical condition — harm arising as a result of a procedure ancillary to the patient's radiation therapy course of treatment, **excluding** infection, bleeding or allergic reaction.

Infection — infection arising from or occurring during planning or delivery of radiation treatment, including but not limited to the transmission of infectious agents because of improper infection control procedures such as handwashing, gowning or equipment cleaning; infections arising during or from an interventional brachytherapy procedure; or infections arising at intravenous access sites.

Bleeding — bleeding arising from or occurring during planning or delivery of radiation treatment, including but not limited to spontaneous bleeding from tumour or normal tissues that disrupts or delays treatment; or interventional brachytherapy procedures that cause bleeding.

Allergic reaction — allergic reaction arising from or occurring during planning or delivery of radiation treatment, including but not limited to reactions to CT or MR contrast agents.

Wrong side (laterality) — involvement of the contralateral side opposite to that identified in the prescription.

Wrong prescription dose fractionation or calculation error — this includes a wrong prescription by the radiation oncologist, incorrect transcription/translation of that prescription at the time of planning or manual dose calculation error.

Excess imaging dose — failure to perform imaging per policy, procedure or protocol that results in excess imaging or excess imaging dose (excluding insufficient, inadequate or poor-quality imaging).

Failure to perform on-treatment imaging per instructions — failure to perform imaging per policy, procedure or protocol that results in insufficient, inadequate or poor-quality imaging (excluding excess imaging and/or excess imaging dose).

Systematic hardware/software (including dose–volume) error — a malfunction in either hardware and/or software that affects the accurate delivery of a treatment plan or results in a patient injury. This includes but is not limited to hardware/software malfunctions and equipment calibration errors leading to dose–volume deviations affecting multiple patients.

Untimely access to medical care or radiotherapy — this includes long wait times for consultation with a radiation oncologist or other medical specialist (surgeon, medical oncologist, palliative care team, etc.), long wait times for treatment (radiotherapy, surgery, chemotherapy, etc.) and long wait times for appropriate follow-up care after completing radiotherapy.

Wrong patient — involvement of an incorrect patient (index patient if more than one affected) or information from or about an incorrect patient, at any step in the radiation treatment assessment, planning and delivery process.

Inadequate coordination of combined modality care — inadequate coordination of radiotherapy with surgery or chemotherapy, including but not limited to improper patient handoff or improper or insufficient information exchange between medical and/or allied health disciplines, and scheduling errors.

Wrong anatomical site (excluding laterality) — involvement of a site other than that identified in the prescription (excluding laterality).

Radiation therapy scheduling error — incorrect coordination of 1 or more radiation treatment tasks resulting in a treatment delay or fractionation schedule not being followed (excluding scheduling errors relating to combined modality care or resulting in excessive/insufficient/inadequate imaging).

Wrong patient position, setup point or shift — incorrect delineation, reference or use of verification points, or other incorrect patient positioning.

Wrong target or OAR contours — incorrect tumour and/or normal tissue contours that do not comply with guidelines and/or standards of practice.

Wrong planning margins — incorrect planning margins that do not comply with policy, procedure or protocol, or a patient-specific planning request.

Treatment plan (isodose distribution) unacceptable — treatment plan (isodose distribution) does not fulfill planning goals as specified by policy, procedure or protocol, or a patient-specific planning request.

Treatment plan acceptable but not physically deliverable — treatment plan (isodose distribution) acceptable but not physically deliverable because of a hardware limitation, including but not limited to a physical device constraint, hardware/hardware collision or patient/hardware collision.

Treatment not delivered: personnel/hardware/software failure — treatment plan (isodose distribution) acceptable but not physically deliverable because of unavailable personnel/equipment or an unrecoverable hardware/software failure.

Wrong, missing, mislabeled or damaged treatment accessories — use of incorrect treatment accessories, or missing, mislabelled or damaged treatment accessories. This includes accessories for external beam radiotherapy and brachytherapy, such as brachytherapy applicators.

Other

## Guide for use

- Mandatory when Type of Radiation Treatment Incident is a programmatic hazard, a near miss or an actual incident.
- Problem Type is to be distinguished from
  - Contributing Factors, which are the circumstances, actions or influences underlying a particular Problem Type and the development of the incident, near miss or programmatic hazard; and
  - Impact, which reflects the medical or dosimetric consequence of the incident on the patient, or the treatment delay arising from the incident or near miss.

For example, the Problem Type *wrong patient position, setup point or shift*, arising because of the Contributing Factor *communication or documentation inadequate (patient specific)* results in a minor dosimetric impact.

- Single-select data element.

## 4.4 Contributing Factors

### Definition

A circumstance, action or influence that is thought to have played a part in the origin or development of an incident or to have increased the risk of an incident.

### Coding values

Communication or documentation inadequate (patient specific) — communication among staff about patient-specific care or treatment issues inappropriate, misdirected and/or not timely. Documentation of patient-specific care or treatment issues is poor, incomplete, unclear or missing. This **excludes** deficits in program-level documentation, including policies and procedures.

Distraction or diversions involving staff — workplace or other disturbances or distractions that divert the attention of staff from the task at hand. Examples include but are not limited to excessive noise, telephone calls, other interruptions and emergency situations.

Equipment software or hardware design, including human factors design, inadequate — suboptimal software or hardware design and/or construction, including complicated or confusing user interfaces. This applies to both commercially available, Health Canada–approved devices and those designed and built in house.

Equipment software or hardware commissioning, calibration or acceptance testing inadequate — a systematic error during initial equipment software or hardware commissioning, calibration or acceptance testing. This applies to commercially available, Health Canada–approved devices and those designed and built in house.

Equipment quality assurance and/or maintenance inadequate — equipment quality assurance checks and/or maintenance is/are not conducted according to the manufacturer's specification and/or policy or procedure.

Expectation bias involving staff — a staff member's tendency to expect particular outcomes in particular circumstances based on prior experience, and to discard observations that appear to conflict with those expectations.

External factors beyond programmatic control — factors affecting program operations and outcomes that are the result of influences extrinsic to the program's normal daily processes. Examples include but are not limited to power outages and adverse weather that affect staff availability and/or programmatic performance.

Change management — ineffective programmatic change management, including but not limited to inadequate communication, an inadequate or incomplete change plan and change fatigue.

Policies and/or procedures not followed — incorrect policy or procedure used, and/or the steps outlined in the policy and/or procedure not followed.

Policies and/or procedures non-existent or inadequate — policies and procedures do not exist or are inadequate or conflicting.

Failure to identify potential risks — potential risks associated with a task or procedure not identified and/or not mitigated. Examples include but are not limited to failure to identify previous tattoos in a patient receiving retreatment to the same area of the body, or failure to identify a patient at risk of falling and/or to take steps to prevent falling.

Human resources inadequate — an insufficient number of practitioners with the necessary expertise and skills to meet the workload demand.

Organizational and/or workspace resources inadequate (excluding human resources) — the organizational and/or workspace resources are inadequate or inappropriate for best-practice clinical care, including the delivery of radiation treatment. Examples include but are not limited to obsolete or improvised equipment (software or hardware) and insufficient space.

Patient education inadequate — the necessary learning requirements of the patient were not met, including being responsive to the patient's needs, values, cultural backgrounds and beliefs, and preferences.

Patient or family member medical condition, preference or behaviour — the medical condition of the patient or the preferences of the patient or family. Examples include but are not limited to a pre-existing cognitive or behavioural problem that prevents the patient from lying still in the treatment position, resulting in a geographic targeting error or a fall, and an angry or disruptive patient or family member.

Handoffs inadequate — potential risks associated with the transfer of information not identified or mitigated. Accountability not identified during patient handoffs. Examples include but are not limited to handoffs between the various steps of the radiation treatment planning and delivery process, handoffs at shift change and handoffs to other health practitioners at the end of radiation treatment.

Staff behaviour — inappropriate human behaviour involving staff.

Staff education or training inadequate — staff not equipped with appropriate knowledge to complete the task at hand with the proper skills, knowledge and judgment.

Unfamiliar treatment approach or radiation treatment technique — a treatment approach or radiation treatment technique that is unfamiliar to staff because it is newly implemented, non-standard or infrequently used.

Other

### **Guide for use**

- Mandatory when Type of Radiation Treatment Incident is a programmatic hazard, a near miss or an actual incident.
- Multiple-select data element.

## **4.5 Number of Patients Affected**

### **Definition**

In the instance that more than 1 patient is involved in a process failure.

### **Coding values**

1

Greater than 1

### **Guide for use**

- Mandatory when Type of Radiation Treatment Incident is an actual incident.
- Not applicable when Type of Radiation Treatment Incident is a programmatic hazard or a near miss.
- Single-select data element.

# **5 Treatment Delivery**

## **Information need**

The radiation treatment technique(s) involved in the incident.

## **Rationale**

Information provided

- Will support root cause analysis within reporting centres;
- Will support the identification of radiation treatment techniques most frequently involved in radiation treatment incidents;
- Will support the development of quality-assurance initiatives that lead to improvements; and
- Can be used to inform radiation treatment technology manufacturers of issues/concerns with their products.

## List of data elements

- 5.1 Radiation Treatment Technique(s)
- 5.2 Total Dose Prescribed
- 5.3 Number of Fractions Prescribed
- 5.4 Number of Fractions Delivered Incorrectly
- 5.5 Hardware Manufacturer and Model Involved
- 5.6 Software Manufacturer and Model Involved
- 5.7 Body Region(s) Treated
- 5.8 Treatment Intent

### 5.1 Radiation Treatment Technique(s)

#### Definition

The type of treatment protocol involved in the incident.

#### Coding values

External beam photon radiotherapy — Simple

External beam photon radiotherapy — 3D conformal

External beam photon radiotherapy — Intensity modulated radiotherapy (IMRT)

External beam photon radiotherapy — Modulated arc therapy

External beam photon radiotherapy — Stereotactic body radiotherapy (SBRT) or stereotactic radiosurgery (SRS)

External beam photon radiotherapy — Orthovoltage

External beam photon radiotherapy — Total body irradiation/total skin electron irradiation/craniospinal irradiation

External beam electron radiotherapy

Brachytherapy — Intraluminal, intravascular, surface

Brachytherapy — Interstitial

Brachytherapy — Low-dose rate (LDR)

Brachytherapy — Pulsed-dose rate (PDR)

Brachytherapy — High-dose rate (HDR)

Brachytherapy — Temporary implant

Brachytherapy — Permanent implant

Brachytherapy — Intracavitary, intraluminal, interstitial, intravascular, surface

Other

### **Guide for use**

- Mandatory when Type of Radiation Treatment Incident is a near miss or an actual incident.
- Not applicable when Type of Radiation Treatment Incident is a programmatic hazard.
- Multiple-select data elements.

## **5.2 Total Dose Prescribed**

### **Definition**

The total dose that was prescribed to the patient involved (index patient if more than one affected) in the incident. In cases where multiple prescriptions are associated with a single treatment plan, it is the prescription most relevant to the incident or near miss.

### **Coding**

NN.NN Gy

### **Guide for use**

- Mandatory when Type of Radiation Treatment Incident is a near miss or an actual incident.
- Not applicable when Type of Radiation Treatment Incident is a programmatic hazard.
- Enter the total dose for the affected prescription in the units Gy.

## **5.3 Number of Fractions Prescribed**

### **Definition**

The total number of fractions prescribed for the patient involved (index patient if more than one affected) in the incident. In cases where multiple prescriptions are associated with a single treatment plan, it is the number of fractions most relevant to the incident or near miss.

### **Coding**

NN fractions

### **Guide for use**

- Mandatory when Type of Radiation Treatment Incident is a near miss or an actual incident.
- Not applicable when Type of Radiation Treatment Incident is a programmatic hazard.
- Enter the total number of fractions for the affected prescription.

## 5.4 Number of Fractions Delivered Incorrectly

### Definition

The number of fractions that were delivered incorrectly in the radiation treatment plan involved in the incident.

### Coding

NN fractions

### Guide for use

- Mandatory when Type of Radiation Treatment Incident is an actual incident.
- Not applicable when Type of Radiation Treatment Incident is a programmatic hazard or a near miss.
- Enter the total number of fractions for the affected prescription delivered incorrectly.

## 5.5 Hardware Manufacturer and Model Involved

### Definition

The hardware manufacturer and model that was involved in the radiation treatment incident, if relevant.

### Coding

Text

### Guide for use

- Optional when Type of Radiation Treatment Incident is a programmatic hazard, a near miss or an actual incident.
- Enter the hardware manufacturer and model involved in the incident, if applicable.

## 5.6 Software Manufacturer and Model Involved

### Definition

The software manufacturer and model that was involved in the radiation treatment incident, if relevant.

### Coding

Text

## Guide for use

- Optional when Type of Radiation Treatment Incident is a programmatic hazard, a near miss or an actual incident.
- Enter the software manufacturer and model involved in the incident, if applicable.

## 5.7 Body Region(s) Treated

### Definition

The treatment site(s) involved in the incident.

### Coding values

Brain

Spine

Head and neck

Breast

Thorax

Abdomen

Pelvis

Upper extremity

Lower extremity

Skin

### Guide for use

- Mandatory when Type of Radiation Treatment Incident is an actual incident.
- Optional when Type of Radiation Treatment Incident is a near miss.
- Not applicable when Type of Radiation Treatment Incident is a programmatic hazard.
- Multiple-select data element.

## 5.8 Treatment Intent

### Definition

The purpose of the prescribed course of radiation therapy.

## **Coding values**

Curative (radical)

Palliative

Do not know

## **Guide for use**

- Optional when Type of Radiation Treatment Incident is a near miss or an actual incident.
- Not applicable when Type of Radiation Treatment Incident is a programmatic hazard.
- Single-select data element.

# 6 Incident Investigation

## **Information need**

- Indication of whether or not the radiation treatment centre has conducted or is planning to conduct a systematic review of how and why the incident occurred and of the environmental context in which the incident occurred.
- Documentation of corrective action(s) planned or implemented by the radiation treatment centre to prevent recurrence (e.g., change in policy, enhanced training/education, standardizing procedures, simplifying systems).
- An indication of whether or not the patient was informed of the medication incident.

## **Rationale**

Information provided

- Will support the development of quality-assurance initiatives that lead to improvements; and
- Identify effective corrective actions.

## **List of data elements**

- 6.1 Immediate Ameliorating Actions
- 6.2 Safety Barrier(s) That Failed to Identify the Incident
- 6.3 Safety Barrier(s) That Identified the Incident
- 6.4 Actions Taken or Planned to Reduce Risk, and Other Recommendations

## 6.1 Immediate Ameliorating Actions

### Definition

An action taken or circumstances altered to make better or compensate any harm after an incident.

### Coding values

#### Organization-related

- Complaint management
- Education or training
- Media or public relations management
- Staff debriefing or counselling — an offer of practical and emotional support, such as spiritual care services, counselling, social work, etc., as needed

#### Patient-related

- Medical management of patient injury — the implementation of a medical intervention to correct for the effects of the incident
- Patient disclosure — an indication as to whether or not the patient, the patient's family or a substitute decision-maker was informed of the incident, its outcome(s) and the next steps
- Documentation of an incident or near miss in patient's medical record — documentation of the incident, the clinical impact and implications of the incident and patient/family disclosure in the patient's medical record
- Radiation prescription dose revision — a change to the radiation prescription to accommodate the effects of the incident
- Radiation treatment plan revision — a change to the dosimetric plan to accommodate the effects of the incident
- Radiation treatment volume revision — a change to the planned volume to accommodate the effects of the incident

None required

Other

## Guide for use

- Mandatory when Type of Radiation Treatment Incident is an actual incident.
- Not applicable when Type of Radiation Treatment Incident is a programmatic hazard or a near miss.
- Multiple-select data element

## 6.2 Safety Barrier(s) That Failed to Identify the Incident

### Definition

A safety barrier is a physical or non-physical means planned to prevent, control or mitigate undesired events or accidents.

### Coding values

#### Hardware/software

- Use of record and verifying system – the software used to document and validate the accurate delivery of monitor units for a delivered fraction
- Image-based patient position verification — the process of image-guidance (megavoltage, kilovoltage, planar or volumetric) confirmation of the accurate patient positioning at the time of treatment delivery
- Image-based accessory verification
- Image-based target or OAR verification
- Equipment protection system (collision detection devices)
- Emergency shutdown
- Interlocks
- Independent review of commissioning
- Regular equipment performance verification
- Regular external dosimetry and performance audit
- Mock setup

#### Process

- Verification of patient ID
- Informed consent for body region and laterality
- Pregnancy check
- Pacemaker or other implantable device check

- Verification of laterality
- Verification of relevant clinical information
- Verification of imaging data for planning
- Oncologist peer review
- Radiation therapist review of treatment plan
- Physicist review of treatment plan
- Oncologist review of treatment plan
- Independent confirmation of dose
- Time out/verbalization/call-back
- Verification of treatment accessories
- Verification of reference points
- Therapist review of treatment position
- On-treatment therapist chart check
- Intra-treatment monitoring (audio/visual, motion tracking)
- Review of portal or CBCT<sup>i</sup> images
- Regular on-treatment patient medical review
- Regular chart check
- Regular internal audit

Other

None

### **Guide for use**

- Mandatory when Type of Radiation Treatment Incident is a near miss or an actual incident.
- Optional when Type of Radiation Treatment Incident is a programmatic hazard.
- For actual incidents, reporter will select barriers relevant to the problem type and contributing factors since safety barriers failed.
- Multiple-select data element.

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i. Cone-beam computed tomography.

## 6.3 Safety Barrier(s) That Identified the Incident

### Definition

A safety barrier is a physical or non-physical means planned to prevent, control or mitigate undesired events or accidents.

### Coding values

#### Hardware/software

- Use of record and verifying system — the software used to document and validate the accurate delivery of monitor units for a delivered fraction
- Image-based patient position verification — the process of image-guidance (megavoltage, kilovoltage, planar or volumetric) confirmation of the accurate patient positioning at the time of treatment delivery
- Image-based accessory verification
- Image-based target or OAR verification
- Equipment protection system (collision detection devices)
- Emergency shutdown
- Interlocks
- Independent review of commissioning
- Regular equipment performance verification
- Regular external dosimetry and performance audit
- Mock setup

#### Process

- Verification of patient ID
- Informed consent for body region and laterality
- Pregnancy check
- Pacemaker or other implantable device check
- Verification of laterality
- Verification of relevant clinical information
- Verification of imaging data for planning
- Oncologist peer review
- Radiation therapist review of treatment plan
- Physicist review of treatment plan

- Oncologist review of treatment plan
- Independent confirmation of dose
- Time out/verbalization/call-back accomplished either through second check or a pause
- Verification of treatment accessories
- Verification of reference points
- Therapist review of treatment position
- On-treatment therapist chart check
- Intra-treatment monitoring (audio/visual, motion tracking)
- Review of portal or CBCT images
- Regular on-treatment patient medical review
- Regular chart check
- Regular internal audit

Other

None

### **Guide for use**

- Mandatory when Type of Radiation Treatment Incident is a near miss.
- Optional when Type of Radiation Treatment Incident is a programmatic hazard.
- Not applicable when Type of Radiation Treatment Incident is an actual incident.
- Multiple-select data element

## **6.4 Actions Taken or Planned to Reduce Risk, and Other Recommendations**

### **Definition**

Prevention activities planned or implemented within the radiation treatment centre and recommendations to minimize future harm.

### **Coding values**

Hardware/software

- Automation or computerization — substituting software functions for tasks previously completed manually
- Human factors redesign — a review of processes with consideration of human factors engineering and implementing those changes accordingly (e.g., expectation bias)

- New device(s) — hardware or software implemented as a corrective solution to the identified hazard
- New forcing function(s) — a behaviour-shaping constraint that prevents the user from creating an error state (e.g., a software that will not accept a number entry when asking for patient name)
- New interlock(s)

#### Process

- Eliminate look-alike(s)
- Increase staffing levels or decrease workload
- Incorporate redundancy
- Leadership action — culture change
- Process simplification — employing lean methodology to review processes and identify waste and unnecessary steps in a process
- Process standardization
- Reduce distraction(s)
- Reminder(s) or checklist(s)
- Time out(s), verbalization or call-back(s)
- Warning label(s)

#### Education/training

- Additional education or training
- Improve compliance with existing policies or procedures
- New policies or procedures
- Staff reminder(s)

#### None

#### Other

### **Guide for use**

- Optional when Type of Radiation Treatment Incident is a programmatic hazard, a near miss or an actual incident.
- Multiple-select data element.

## 7 Unique Identifiers

### Rationale

To uniquely identify entities/incident records within NSIR.

### List of data elements

- 7.1 NSIR Case Identifier
- 7.2 HCF<sup>ii</sup> Case Record Number
- 7.3 HCF Unique Identifier

### 7.1 NSIR Case Identifier

#### Definition

The system-generated unique identification number assigned to an incident; also known as the NSIR Case ID.

#### Coding

NNNNNNNNN

#### Guide for use

None

### 7.2 HCF Case Record Number

#### Rationale

HCFs may submit an internal reference number/code for each incident reported. This number will be stored in the system in order to facilitate the HCFs' reconciliation of incidents, especially in cases where incident data is provided from existing risk management incident-reporting systems.

#### Definition

The unique identifier assigned to an incident by HCFs.

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ii. Health care facility.

## Coding

Text

### Guide for use

- Optional for single record submission.

## 7.3 HCF Unique Identifier

### Definition

System-generated unique identifier for each registered HCF.

### Coding

Alphanumeric (i.e., HCF-NNNNNNNN)

### Guide for use

None

## 8 HCF Service Profile

### Information need

To gather relevant organizational characteristics and service information specific to the HCF reporting to CIHI.

### Rationale

This data domain

- Captures facility-level data so that it may be aggregated into meaningful summary categories for analysis and reporting.

Specifically, the organizational characteristics and service information may provide indicators of

- Facility size;
- Population characteristics;
- Scope and complexity of care;
- Availability of specialized human resources, medical services and equipment; and
- Complexity of the pharmacy services.

Note: HCF Service Profile data elements are initially captured when a facility is first registered and are updated periodically. These data elements are not part of an incident record.

## List of data elements

- 8.1 Principal Type of Health Care Provided
- 8.2 Type of Setting
- 8.3 Number of Beds Staffed and in Operation
- 8.4 Type of Drug Distribution System
- 8.5 Computerized Prescriber Order Entry

### 8.1 Principal Type of Health Care Provided

#### Definition

The main type of health care provided by the HCF. This data element is applicable to acute care facilities only.

#### Coding values

- |           |  |
|-----------|--|
| Primary   | Consists of basic curative care (including simple diagnosis and treatment and referral of complex cases to a higher level), preventive care and essential health education provided at the point of entry into the health care system. |
| Secondary | Consists of specialized care requiring more sophisticated and complicated diagnosis and treatment than is provided at the primary health care level.   |
| Tertiary  | Consists of highly specialized diagnostic and therapeutic services, which can usually be provided only in centres specifically designed, staffed and equipped for this purpose.  |

#### Guide for use

- Single-select data element.
- Not applicable for long-term care facilities.

## 8.2 Type of Setting

### Definition

Classification of the HCF by the types of services provided.

### Coding values

Long-term care facility	A licensed health care facility that provides 24-hour nursing care with regulated nurses.
Cancer treatment hospital	A specialty hospital, group of beds or rooms, or separate wing or building that is recognized as a distinct and separate treatment unit of the hospital and that provides primarily for the diagnosis and treatment of inpatients and clients with neoplastic tumours/diseases.
Extended care hospital (including chronic)	A specialty hospital, group of beds or rooms, or separate wing or building for long-term care that is recognized as a distinct and separate treatment unit of the hospital and that provides primarily for the continuing treatment of service recipients with long-term illness or with a low potential for recovery and who require regular medical assessment and continuing nursing care.
General hospital	A hospital that provides primarily for the diagnosis and short-term treatment of inpatients and clients with a wide range of diseases or injuries; the services of a general hospital are not restricted to a specific age group or sex.
Pediatric hospital	A specialty hospital, group of beds or rooms, or separate wing or building for pediatrics that is recognized as a distinct and separate treatment unit of the hospital and that provides primarily for the diagnosis and short-term treatment of pediatric inpatients and clients who are age 18 or younger.
Psychiatric and substance abuse hospital	A specialty hospital, group of beds or rooms, or separate wing or building that provides primarily for the assessment and treatment of inpatients, clients and/or residents with short- and/or long-term psychiatric and substance abuse disorders and that is recognized as a distinct and separate treatment unit of the hospital.

Rehabilitation hospital	A specialty hospital, group of beds or rooms, or separate wing or building that is recognized as a distinct and separate treatment unit of the hospital and that provides primarily for the continuing assessment and treatment of inpatients and clients whose condition is expected to improve significantly through the provision of physical medicine and other rehabilitative services.
Other specialty hospital	A specialty hospital, group of beds or rooms, or separate wing or building for a specialty that is not elsewhere classified that is recognized as a distinct and separate treatment unit of the hospital and that provides primarily for the diagnosis and treatment of inpatients and/or clients receiving specialty care that is not elsewhere classified (e.g., obstetrical, orthopedic).

### **Guide for use**

- Single-select data element.
- Mandatory information submitted to CIHI.

## **8.3 Number of Beds Staffed and in Operation**

### **Definition**

The beds and cribs available and staffed to provide services to patients/residents at the required type and level of service at the beginning of the fiscal year. Includes bassinets set up outside the nursery and used for infants other than newborns.

### **Coding values**

Fewer than 50

50 to 99

100 to 199

200 to 299

300 to 399

400 to 499

500 or more

### **Guide for use**

- Single-select data element.
- Mandatory information submitted to CIHI.

## 8.4 Type of Drug Distribution System

### Definition

The type of drug distribution system used to service the majority of beds ( $\geq 90\%$ ) within the HCF.

### Coding values

Unit dose	A type of drug distribution system in which patient/resident-specific medication is dispensed in single doses consisting of individual, pre-packaged, pre-labelled containers.
Traditional	A type of drug distribution system in which a multi-day supply of patient/resident-specific medication is dispensed to the wards/units.
Total ward stock	A type of drug distribution system in which medication is supplied to the wards/units in bulk format.

### Guide for use

- Single-select data element.
- Mandatory information submitted to CIHI.

## 8.5 Computerized Prescriber Order Entry

### Definition

A process whereby medication orders are entered into the computer system by a licensed prescriber.

### Coding

Are 50% or more of prescriptions within the HCF entered into a computerized prescriber order entry system?

Yes

No

### Guide for use

- Single-select data element.
- Mandatory information submitted to CIHI.

# Appendix A: List of data elements

Mandatory and optional data elements are specified based on whether it is an actual incident, a near miss or a programmatic hazard.

M = Mandatory      O = Optional      N/A = Not applicable

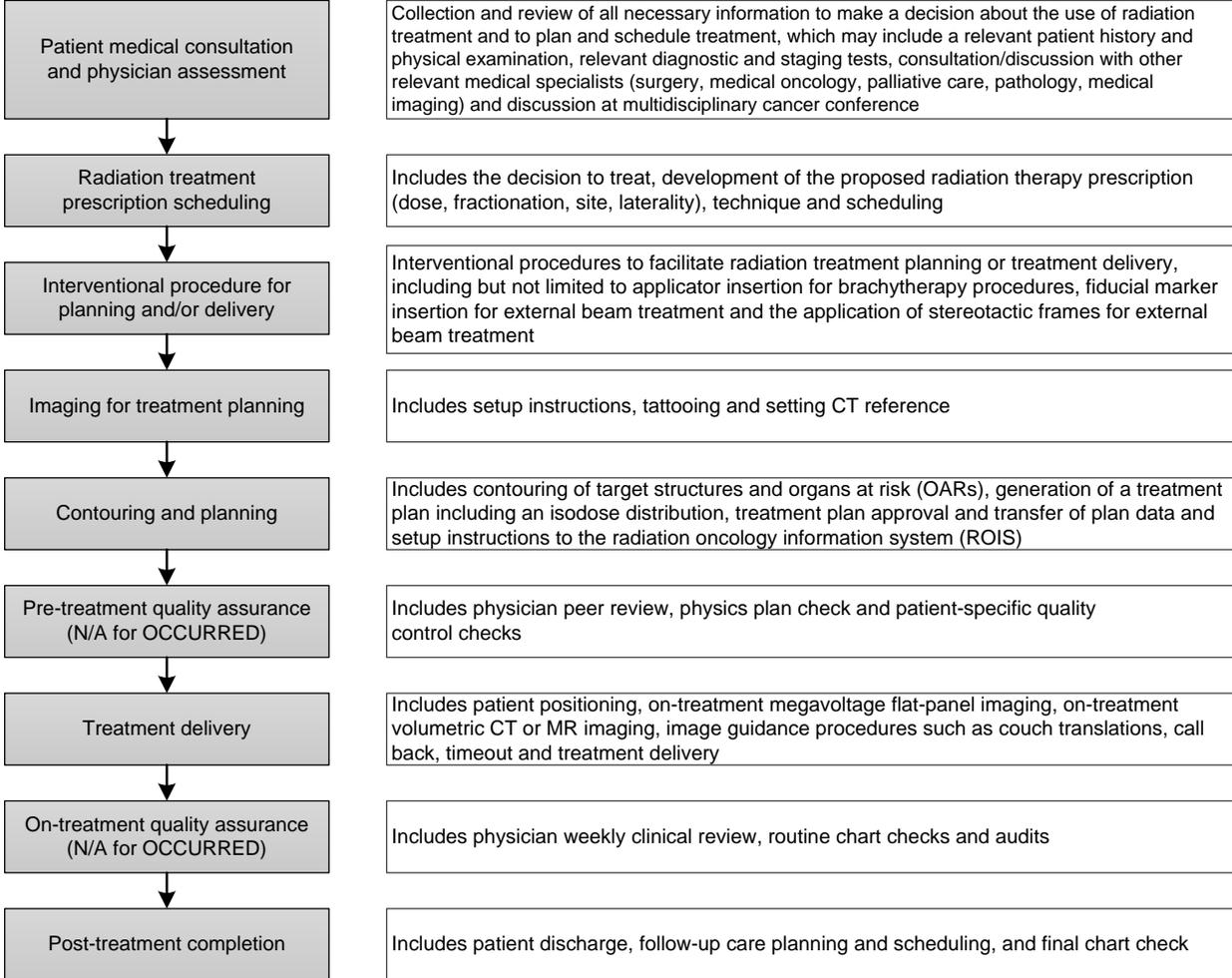
	Data element	Programmatic hazard	Near miss	Actual incident (all known values)
<b>1</b>	<b>Incident Impact</b>			
<b>1.1</b>	Incident Description	M	M	M
<b>1.2</b>	Type of Radiation Treatment Incident	M	M	M
<b>1.3</b>	Acute Medical Harm	N/A	N/A	M
<b>1.4</b>	Dosimetric Impact	N/A	N/A	M
<b>1.5</b>	Latent Medical Harm	N/A	N/A	M <sup>iii</sup>
<b>2</b>	<b>Incident Discovery</b>			
<b>2.1</b>	Functional Work Area	M	M	M
<b>2.2</b>	Date Incident Was Detected	M	M	M
<b>2.3</b>	Date Incident Occurred	N/A	O	O
<b>2.4 and 2.5</b>	Time or Time Period Incident Was Detected	M	M	M
<b>2.6 and 2.7</b>	Time or Time Period Incident Occurred	N/A	O	O
<b>2.8</b>	Health Care Provider(s) and/or Other Individual(s) Who Detected the Incident	O	O	O
<b>2.9</b>	Health Care Provider(s) and/or Other Individual(s) Involved in the Incident	O	O	O
<b>3</b>	<b>Patient Characteristics</b>			
<b>3.1</b>	Patient Month of Birth	N/A	O	O
<b>3.2</b>	Patient Year of Birth	N/A	O	O
<b>3.3</b>	Patient Gender	N/A	O	M

iii. Not applicable when Acute Medical Harm is *death* or Dosimetric Impact is *none*.

	<b>Data element</b>	<b>Programmatic hazard</b>	<b>Near miss</b>	<b>Actual incident (all known values)</b>
<b>3.4</b>	Diagnosis Relevant to Treatment	N/A	O	M
<b>4</b>	<b>Incident Details</b>			
<b>4.1</b>	Process Step Where Incident Occurred	N/A	M	M
<b>4.2</b>	Process Step Where Incident Was Detected	M	M	M
<b>4.3</b>	Problem Type	M	M	M
<b>4.4</b>	Contributing Factors	M	M	M
<b>4.5</b>	Number of Patients Affected	N/A	N/A	M
<b>5</b>	<b>Treatment Delivery</b>			
<b>5.1</b>	Radiation Treatment Technique(s)	N/A	M	M
<b>5.2</b>	Total Dose Prescribed	N/A	M	M
<b>5.3</b>	Number of Fractions Prescribed	N/A	M	M
<b>5.4</b>	Number of Fractions Delivered Incorrectly	N/A	N/A	M
<b>5.5</b>	Hardware Manufacturer and Model Involved	O	O	O
<b>5.6</b>	Software Manufacturer and Model Involved	O	O	O
<b>5.7</b>	Body Region(s) Treated	N/A	O	M
<b>5.8</b>	Treatment Intent	N/A	O	O
<b>6</b>	<b>Incident Investigation</b>			
<b>6.1</b>	Immediate Ameliorating Actions	N/A	N/A	M
<b>6.2</b>	Safety Barrier(s) That Failed to Identify the Incident	O	M	M
<b>6.3</b>	Safety Barrier(s) That Identified the Incident	O	M	N/A
<b>6.4</b>	Actions Taken or Planned to Reduce Risk, and Other Recommendations	O	O	O
<b>7</b>	<b>Unique Identifiers</b>			
<b>7.1</b>	NSIR Case Identifier	System generated	System generated	System generated
<b>7.2</b>	HCF Case Record Number	O	O	O
<b>7.3</b>	HCF Unique Identifier	N/A	N/A	N/A

	<b>Data element</b>	<b>Programmatic hazard</b>	<b>Near miss</b>	<b>Actual incident (all known values)</b>
<b>8</b>	<b>HCF Service Profile</b>			
<b>8.1</b>	Principal Type of Health Care Provided	N/A	N/A	N/A
<b>8.2</b>	Type of Setting	N/A	N/A	N/A
<b>8.3</b>	Number of Beds Staffed and in Operation	N/A	N/A	N/A
<b>8.4</b>	Type of Drug Distribution System	N/A	N/A	N/A
<b>8.5</b>	Computerized Prescriber Order Entry	N/A	N/A	N/A

# Appendix B: NSIR-RT treatment process map



# References

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