The Canadian national system for incident reporting in radiation treatment (NSIR-RT) taxonomy

(April 23, 2015)

Taxonomy Data Category		Data Fields and Menu Choices
Number	**Description**	
1. Impact		
1.1	Incident description	Free text
1.2	Incident type	**Actual incident**: Reached the patient, with or without harm
		Near miss: Detected before reaching the patient
		Reportable circumstance: Hazard not involving a patient
1.3	Acute medical harm (Adapted from the WHO-ICPS)	**Not applicable**: Near miss or reportable circumstance
		None: 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.
		Unknown
1.4	Dosimetric severity	**Not applicable**: Near miss or reportable circumstance
		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
		Unknown

1.5	Latent medical harm	**Not applicable**: Near miss or reportable circumstance
		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.
		Unknown
2. Discovery		
2.1	Functional work area	Field to be customized for individual programs
2.2	Date incident was detected	DD:MMM:YYYY
2.3	Date incident occurred	DD:MMM:YYYY
2.4	Time or time period when the incident was detected	HH:MM
		00:00-3:59
		04:00-07:59
		8:00-11:59
		12:00-15:59
		16:00-19:59
		20:00-23:59
		Unknown
2.5	Time or time period when the incident occurred	HH:MM
		00:00-3:59
		04:00-07:59
		8:00-11:59
		12:00-15:59
		16:00-19:59
		20:00-23:59
		Unknown
2.6	Health care provider(s) and/or other individual(s) who detected the incident	Radiation therapist
		Treatment planner or dosimetrist
		Medical physicist
		Radiation oncologist
		Technical maintenance staff

	(Multiple selections as warranted)	Nursing staff
		Physician assistant
		Resident or fellow
		Student or other trainee
		Administrator
		Patient
		Family member
		Other
		Unknown
2.7	Health care provider(s) and/or other individuals(s) involved in the incident (Multiple selections as warranted)	Radiation therapist
		Treatment planner or dosimetrist
		Medical physicist
		Radiation oncologist
		Technical maintenance staff
		Nursing staff
		Physician assistant
		Resident or fellow
		Student or other trainee
		Administrator
		Patient
		Family member
		Other
		Unknown
3. Patient		
3.1	Patient year of birth	YYYY
3.2	Patient month of birth	MM
3.3	Patient gender	Male
		Female
		Undifferentiated
		Unknown
3.4	Diagnosis relevant to treatment	Breast cancer
		Central nervous system tumors

		Gastrointestinal cancer	
		Genitourinary cancer	
		Gynecological cancer	
		Head and neck cancer	
		Lymphoma or leukemia	
		Melanoma/Non-melanoma skin cancer	
		Sarcoma	
		Thoracic malignancy	
		Benign	
		Other	
4. Details			
4.1	Process step where the incident occurred (Refer to process map for detailed description of each process step)	Patient assessment/consultation	
		Imaging for radiotherapy planning	
		Treatment planning	
		Pre-treatment review and verification	
		Treatment delivery	
		On-treatment quality management	
		Post-treatment completion	
		Other	
4.2	Process step where the incident was detected (Refer to process map for detailed description of each process step)	Patient assessment/consultation	
		Imaging for radiotherapy planning	
		Treatment planning	
		Pre-treatment review and verification	
		Treatment delivery	
		On-treatment quality management	
		Post-treatment completion	
		Other	
4.3	Problem type (Single primary selection, multiple secondary selections	Patient related circumstance or accident	Allergic reaction
			Infection
			Interventional procedure error
			Fall or other accident
		Hardware/Software	

	as warranted)	Dose	Wrong prescription dose	
			Wrong plan dose	
			Calculation error	
			Calibration error	
		Treatment volume	Wrong patient	
			Wrong anatomical site	
			Wrong side (laterality)	
			Wrong patient position	
			Wrong shift from setup point	
			Wrong target or OAR contours, or wrong planning margins	
			Patient movement during simulation or treatment	
			Wrong treatment accessories	
		Scheduling	Radiation treatment scheduling error	
			Combined modality treatment scheduling error	
		Other		
4.4	Contributing factors (Multiple selections as warranted)	Program management or planning	Human resources inadequate	
			Capital resources inadequate	
			Policies, procedures or regulations inadequate	Not followed
				Non-existent
				Conflicted
			Education or training inadequate	
			Communication inadequate	Documentation poor, incomplete, unclear or missing
				Medical record poor, incomplete, unclear or missing
				Communication not timely
				Communication inappropriate or misdirected
			Physical environment inadequate	
			External factors beyond programmatic control	
		Clinical infrastructure	Materials, tools or equipment inadequate or insufficient	
			Commissioning or acceptance testing inadequate	

			Equipment design or construction inadequate	Software operational error
			Equipment maintenance inadequate	
		Clinical process	Failure to detect a developing problem	Loss of attention
				Expectation bias
			Failure to select the correct rule	
			Failure to develop an effective plan	Inadequate change management
				Inadequate needs or risk assessment
				Failure to recognize a hazard
			Failure to execute a planned action	Plan forgotten in progress
			Patient related circumstances	
			Human behavior involving staff	
		Other		
4.5	Number of patients affected	0 (Reportable circumstance)		
		1		
		More than 1		
5. Treatment Delivery				
5.1	Radiation treatment technique (Multiple selections as warranted)	External beam photon radiotherapy - Simple		
		External beam photon radiotherapy - 3D conformal		
		External beam photon radiotherapy - IMRT		
		External beam photon radiotherapy - Modulated arc therapy		
		External beam photon radiotherapy - SBRT or SRS		
		External beam photon radiotherapy - Orthovoltage		
		External beam electron radiotherapy		
		Brachytherapy – Intraluminal, intravascular, surface		
		Brachytherapy - Interstitial		
		Brachytherapy – LDR		
		Brachytherapy – PDR		
		Brachytherapy – HDR		
		Brachytherapy - Temporary implant		
		Brachytherapy - Permanent implant		
		Other		

5.2	Total dose prescribed	NN.NN Gy	
		Not applicable	
5.3	Number of fractions prescribed	NN Fractions	
		Not applicable	
5.4	Number of fractions delivered incorrectly	NN Fractions	
		Not applicable	
5.5	Hardware involved (if relevant)	Yes (Free text - specify manufacturer and model)	
		No	
5.6	Software involved (if relevant)	Yes (Free text - specify manufacturer and model)	
		No	
5.7	Body region(s) treated (Multiple selections as warranted)	Brain	
		Spine	
		Head and neck	
		Thorax	
		Abdomen	
		Pelvis	
		Upper extremity	
		Lower extremity	
		Skin	
5.8	Treatment intent	Curative (Radical)	
		Palliative	
		Unknown	
6. Investigation			
6.1	Ameliorating actions (To make better or compensate harm due to a specific incident) (Multiple selections as warranted)	Patient related	Medical management of patient injury
			Radiation treatment plan revision
			Radiation prescription dose revision
			Radiation treatment volume revision
			Patient disclosure
		Organization related	Media or public relations management
			Complaint management
			Staff debriefing or counselling
			Education or training

			Culture change
		Other	
6.2	Safety barrier(s) that failed to prevent the incident (Multiple selections as warranted)	Hardware/Software	Use of record and verifying system
			Image-based patient position verification
			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
		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
			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	
6.3	Safety barrier(s) that prevented the incident (Multiple selections as warranted. By definition, this is *None* for actual incidents.)	Hardware/Software	Use of record and verifying system
			Image-based patient position verification
			Image-based accessory verification
			Image-based target or OAR verification
			Equipment protection system (collision detection devices)
			Emergency shutdown
			Interlocks
			Independent review of commissioning
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			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
			Intra-treatment monitoring (audio/visual, motion tracking)
			Review of portal or CBCT images
			Regular on-treatment patient medical review
			Regular physics chart check
			Regular internal audit

		Other	
		None	
6.4	Actions taken or planned to reduce risk, and other recommendations (Multiple selections as warranted)	Hardware/Software (Most effective)	New device(s)
			New interlock(s)
			New forcing function(s)
			Automation or computerization
			Human factors redesign
		Process (Moderately effective)	Leadership action – Culture change
			Process standardization
			Process simplification
			Reminder(s) or checklist(s)
			Time out(s), verbalization or call-back(s)
			Staff reminder(s)
			Warning label(s)
			Reduce distraction(s)
			Eliminate look alike(s)
			Incorporate redundancy
			Increase staffing levels or decrease workload
		Education/Training (Least effective)	Improved compliance with existing policies or procedures
			New policies or procedures
			Additional education or training
		Other	

CBCT Cone beam computed tomography
OAR Organ at risk
WHO-ICPS World Health Organization Conceptual Framework for the International Classification of Patient Safety