

The National System for Incident Reporting And System Learning in Radiation Therapy: A Sustainable Approach To Quality And Safety In Cancer Care in Canada

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BACKGROUND:

Canada utilizes a public payer, private health care delivery model that is delegated sub-nationally. As a result, effective coordination of access to safe, high quality care can be challenging in this and other similar international models. One strategy to improve quality of care in radiotherapy (RT) is to standardize incident management. This non-punitive approach to learning from one's mistakes, and the free exchange of this information with others in the community helps prevent incident recurrence and propagation.

The Canadian Partnership for Quality Radiotherapy (CPQR) is a novel national policy approach employing pan-Canadian engagement from both the RT community and senior leadership to accelerate development and implementation of guidelines for safe, high quality RT. Its programs, including work in incident management, will help improve harmonization in radiation treatment quality and safety nationally.

WHAT IS INCIDENT MANAGEMENT & WHY IS IT IMPORTANT?

Learning from near misses and incidents that occur during treatment planning and delivery plays a significant role in RT quality assurance (QA). Currently, many RT programs in Canada have local solutions for incident management; however, there is variability in the type of information that is collected and how data elements are defined. This makes it challenging for centres, jurisdictions and the country as a whole to learn from each other using a systematic approach. As such, a need for a national approach to incident management and learning has been identified across the country to address this gap.

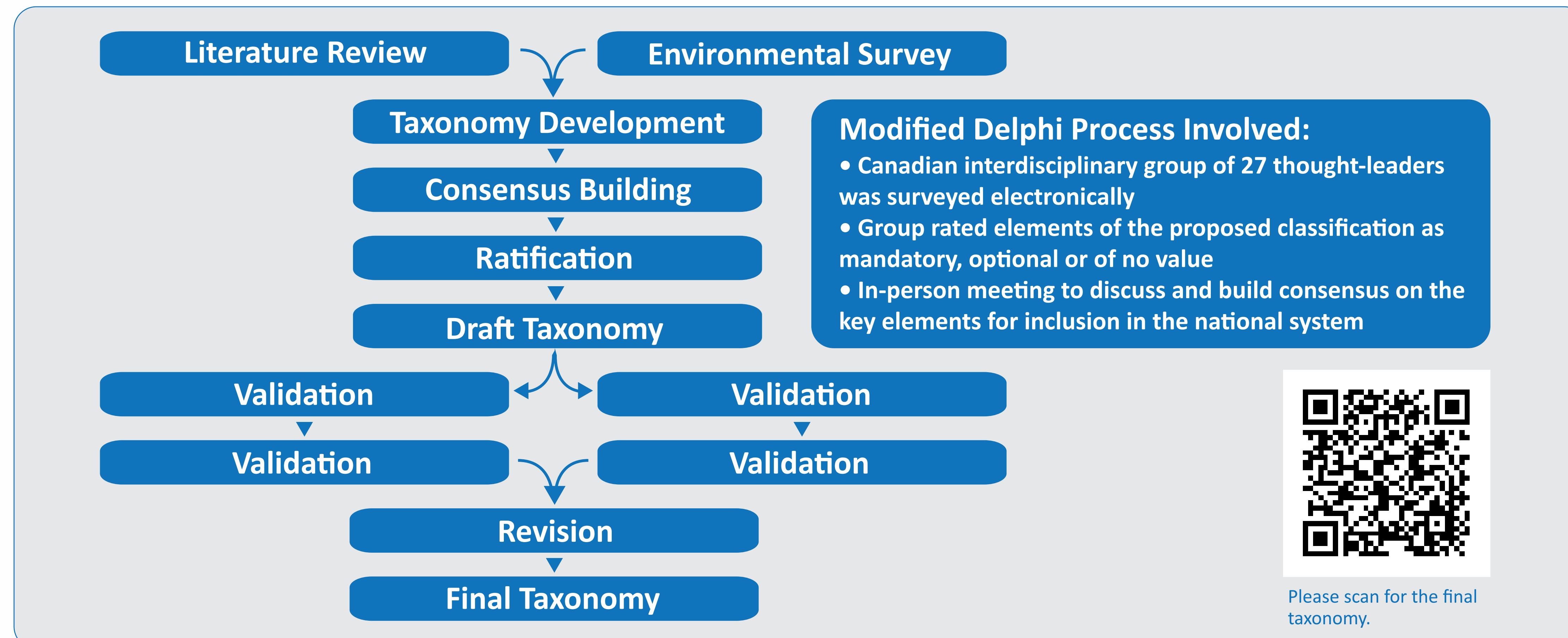
In collaboration with the Canadian Institute for Health Information (CIHI), CPQR is working to create the National System for Incident Reporting in Radiation Therapy (NSIR-RT). This system will be leveraged from the existing national system for incident reporting (NSIR) on medications and IV fluids that Canada contributes into, and CIHI manages.

The NSIR-RT will be the first central repository for RT incidents in Canada. This initiative will provide RT programs with an electronic resource to report, track, analyze and learn from RT incidents and near misses locally. The system will also facilitate sharing, learning and analyzing incidents from all Canadian RT centres, using a common language. This solution will help identify system vulnerabilities, facilitate rapid communication of potentially severe hazards, and ensure continuous quality improvement in RT across Canada.

HOW WE ARE DEVELOPING AND IMPLEMENTING NSIR-RT ACROSS CANADA?

Prior to the development of the taxonomy, a literature review and environmental scan were conducted to review the national and international severity taxonomies to guide the development of the Canadian taxonomy. Existing incident management systems including the World Health Organization, American Society for Radiation Oncology, American Association of Physicists in Medicine and Safety in Radiation Oncology were reviewed by the national working group to identify relevant elements, similarities, differences and existing gaps. The results of this environmental scan informed how the new NSIR-RT data elements would be built. The general taxonomy development process is described in Figure 1.

Figure 1: Taxonomy Development



WHAT HAS BEEN THE WORK PROGRESS TO DATE?

In 2012 CPQR conducted an environmental scan and in depth review of radiation treatment taxonomies being used nationally and internationally. This paved the way for ensuring that NSIR-RT was compatible with existing systems to facilitate future sharing of incident information. This scan resulted in the identification of a core set of elements that were used to develop an initial NSIR-RT taxonomy. This taxonomy underwent a modified-Delphi consensus process that engaged stakeholders from professions involved in radiation treatment delivery in Canada. The resulting taxonomy was validated through inter-rater reliability testing against a set of standardized case studies. The existing taxonomy is available for use and review on the CPQR website and will be used by CIHI to develop the online database. Tables 1 and 2 present the final definitions.

Table 1: Medical degree of harm assessment for severity taxonomy

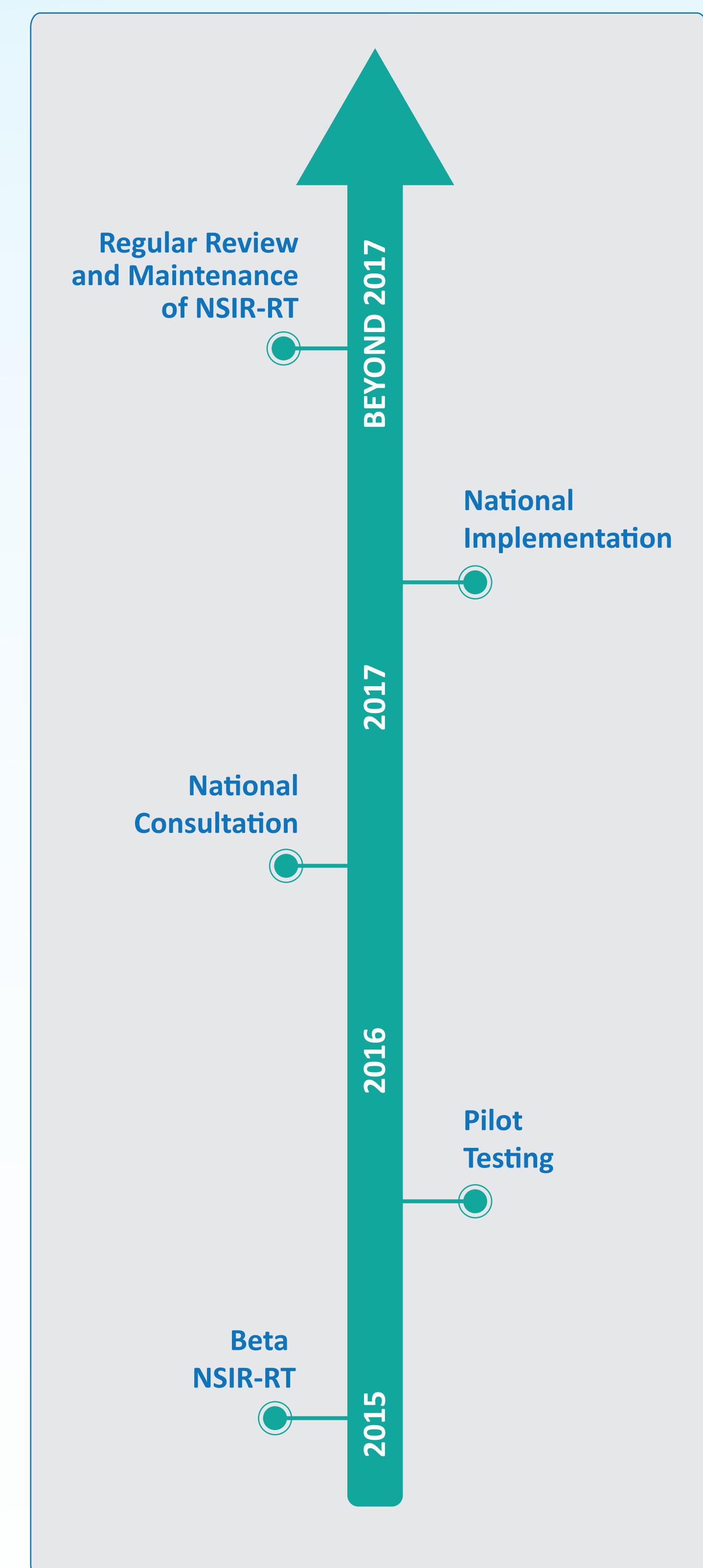
NSIR-RT		
MEDICAL	Death	on balance of probabilities, death was caused or brought forward in the short term by the incident
	Severe	may result in a patient outcome that is symptomatic, requiring life-saving intervention or major surgical/medical intervention, or a shortening life expectancy or causing major permanent or long term harm or loss of function
	Moderate	may result in a patient outcome that is symptomatic, requiring intervention (e.g., additional operative procedure; additional therapeutic treatment), an increased length of stay or causing permanent or long term harm or loss of function
	Mild	may result in a patient outcome that is symptomatic, symptoms are mild, loss of function or harm is minimal or intermediate but short term, and no or minimal intervention (e.g., extra observation, investigation, review or minor treatment) is required
	None	patient outcome is not symptomatic or no symptoms detected and no treatment is required
	Unknown	Unknown

Table 2: Dosimetric impact, relative to the plan dose classification A

DOSIMETRIC	Severe	$\geq 25\%$ relative dose deviation from tumour, or OAR plan dose resulting in underdose, or overdose.
	Moderate	$>5\% - <25\%$ relative dose deviation from tumour, or OAR plan dose resulting in underdose, or overdose.
	Mild	$\leq 5\%$ relative dose deviation from tumour, or OAR plan dose resulting in underdose, or overdose.
	Unknown	Incident has no associated dosimetric impact

All Canadian cancer centres delivering RT can participate in the NSIR-RT development process on a voluntary, confidential basis. A beta version of the NSIR-RT will be ready for pilot testing by late 2015/early 2016, which will then be followed by national consultation in 2016. Finally national implementation will take place in 2017 (Figure 2).

Figure 2: Timeline for implementation of NSIR-RT



CONCLUSIONS:

The collection and analysis of RT incidents through an anonymized and secure national repository such as NSIR-RT has been an expressed desire of the radiation treatment community. Through a collaboration with CPQR, CIHI, the RT community, cancer control senior leadership, and a financial and strategic contribution from the Canadian Partnership Against Cancer, we will for the first time be able to facilitate a coordinated pan-Canadian approach to knowledge transfer and exchange around incident management in RT. This pan-Canadian strategy for quality and safety in RT should lead to improved and coordinated cancer care.