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Editorial

Mitigating the Barriers to a Culture of Quality and Safety in Radiation Oncology

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Introduction

As the field of radiation therapy evolves, the associated technologies, techniques, and practice grow in complexity at an ever-increasing rate. Radiation medicine professionals use these advancements to maximise the therapeutic ratio and to improve person-centred care. In practice, improved imaging capabilities, planning algorithms, increasingly accurate dose-delivery techniques, and a growing interprofessional dependence all contribute to a net positive impact on patient safety and quality of care; however, the double-edged sword of these complex techniques and multiple point-of-care hand-offs throughout the patient's journey is the increased associated risk of adverse events and the need to develop a robust quality-assurance programme embedded within a culture of safety [1] (Figure 1).

Efforts to establish a culture of safety are met by several challenges within the current healthcare landscape. Fiscal constraints often result in the allocation of inadequate personnel and resources to quality and safety-focused roles [2]. A lack of understanding of "*just culture*", in which programmes recognise the contribution of both system design and its interaction with staff behaviour, as well as quality tools, can lead to ineffective and diminished incident reporting. This deficiency, in turn, results in reduced learning and mitigation of hazards and associated risk factors [3]. Practice silos and poor coordination of care may also diminish patient experience, the quality of care provided, and potentially, patient safety [4]. Finally, the lack of programmatic buy-in to quality and safety as an essential basis for an effective radiation treatment programme exacerbates the aforementioned barriers.

Mitigating the barriers to a culture of quality and safety requires careful consideration at the levels of practice of the radiation medicine professionals, programme leadership, and the healthcare system where overarching policy is decided. Establishing a culture of quality and safety within an organisation and within the healthcare system is critical to improve person-centred care and treatment outcomes [5].

Fiscal Constraints

Mindful of the financial burden facing the healthcare sector, non-clinical specialisations often suffer at the hand of fiscal responsibility. Consequently, quality and safety responsibilities are frequently adjunct to the established portfolio of a single practitioner or that of a few members. In its first iteration of the "Quality Assurance Guidance for Canadian Radiation Treatment Programs" (3 April 2011), the Canadian Partnership for Quality Radiotherapy (CPQR) identified the role of a quality control officer as "A qualified individual is designated as having primary responsibility for assuring that all equipment quality control procedures are adhered to, and that appropriate documentation is maintained." In addition, the guidelines identified the need for a radiation treatment quality assurance committee (RTQAC). The RTQAC is tasked with "ensuring the radiation treatment program has a comprehensive quality assurance program that encompasses all aspects of radiation treatment planning and delivery that directly or indirectly impacts patient

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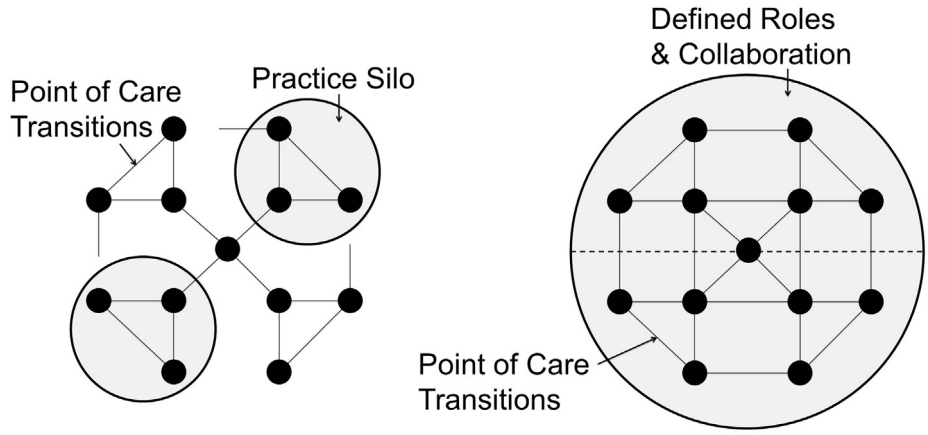

Fig 1. Impact of silage versus defined roles and collaboration.

care." [6] Similarly, the Radiation Oncology Practice Standards of the Royal Australian and New Zealand College of Radiologists' (RANZCR) and Report No. 46: Comprehensive QA for Radiation Oncology of the American Association of Physicists in Medicine recognises the need for these committees to coordinate the quality assurance activities within a programme [7,8]. As automation and the understanding of the underlying causes of risk within the practice grow, so does the workload placed on quality-control officers and their supporting RTQACs [9]. Generally, the costs associated with these roles and quality initiatives have been added to existing operational budgets with no adjustments to current funding models [10]. The focus on human performance failures, continuous quality improvement (CQI), and person-centred care provides evidence that a balance of resources is required to support quality-assurance activities: be it a single coordinator role, shared duties of RTQAC members, or a mixed model. Case in point, with respect to the quality-control officer upon the release of the CPQR "Quality Assurance Guidance for Canadian Radiation Treatment Programs", version 2.0 (1 September 2013), the role of a quality control officer was removed, identified as not being feasible, both fiscally and from a human resources aspect within most radiation oncology programmes [11,12].

A Lack of Understanding of Just Culture and Quality Tools

An incident-learning system is based upon the concept that "safety in a complex operation over a period of time is a function of the number of incidents identified, the number of incidents reported, the quality of investigation and analysis of reported incidents, the effectiveness of corrective actions resulting from these analyses, and the amount of organisational learning that accumulates" [13]. It has been evidenced that programmatic incident learning systems can reduce error and improve efficiency and processes through standardisation [14,15]; however, the success of an incident learning system is correlated to the safety culture within a programme. The historical view of individual accountability for an "adverse event" has transitioned to the modern view of a just culture. Described as the shared accountability between leadership and the practitioner, the concept of a just culture follows the rationale that the majority of individual adverse events result from failures in systems. As these events have the potential to recur, recognising this possibility encourages the organisation to seek systematic solutions to remedy the adverse event [3]. A just culture promotes incident reporting through transparency, a non-punitive approach, and by diminishing the hierarchical structure by which incidents are addressed and investigated within an organisation [16].

A number of tools exist to assist an organisation, not only in recovering from a patient safety event, but also in the process of safety-focused quality improvement. To effectively mitigate and/or improve a system, CQI processes are required to ensure that any interventions are appropriately monitored for both impact and sustainability. Tools, such as, but not limited to, incident reporting and root-cause analysis, failure mode effects analysis, lean processes, and Deming's cycle, build the capacity to modify interventions based upon the system's response [17]. Through the synergistic application of the concept of a just culture and the appropriate application of CQI tools, an organisation can identify opportunities for improvement as well as optimal ways to mitigate, monitor, and improve their systems [18].

Practice Silos and Poor Coordination of Care

The evolution of patient care and treatment complexity has increased the number of interactions a patient experiences along his or her cancer-treatment pathway [19]. Subsequently, it has also increased the number of point-of-care transitions, and transfers of accountability. At each of these points, there exists the potential for a failure of communication intra-professionally, inter-professionally, and with the patient, creating the potential for an adverse patient safety event. Effective communication and removal of silos among professions is essential to the development

of a cohesive and high-performance team, not only within a radiation oncology programme, but also within a comprehensive cancer programme [17]. Employing the seemingly contradictory concepts of clearly defined roles and collaboration ensures seamless transitions as the patient moves along the cancer care trajectory.

Defining the roles of each member of an interprofessional team ensures that the responsibility for each aspect of care is identified and properly addressed. Collaboration brings these discrete members together into a forum in which each team member operates equally and efficiently, recognising the value and contribution of each individual to the safety and quality of care to the patient. Not limited to direct patient care, effective interprofessional collaboration extends to CQI and other safety-improvement initiatives ultimately impacting the performance of the programme [18].

Lack of Programmatic Buy-in to Quality and Safety

Programmatic and healthcare system buy-in to quality and safety initiatives can directly impact the downstream quality of care delivered to patients. Recognising a grassroots approach is necessary, but it also requires systems-level buy-in to effectively impact change at the patient–practitioner interface. In Canada, the CPQR (www.cpqr.ca), established in 2010, is an example of a systems-level quality-of-care initiative. Supported by the various professional associations involved in radiation treatment within Canada, as well as the federally-funded Canadian Partnership Against Cancer, the CPQR developed a number of frameworks to guide quality at the programmatic level. The CPQR partners with representatives within each radiation programme across Canada, who are tasked to promote the partnership's initiatives and increase buy-in to the pan-Canadian quality agenda at a local level.

Buy-in can also be catalysed through the development of guidelines, recommendations, and audits, which outline benchmarks for achievement by radiation treatment programmes. A number of guidance documents and services are available to radiation oncology programmes to monitor health quality through benchmarking. The Q-Mentum Cancer Care Module (Accreditation Canada), TECDOC-989 Quality Assurance in Radiotherapy (The International Atomic Energy Agency), ISO 9001 Quality Management (International Organization for Standardization), Radiation Oncology Practice Standards (RANZCR), and Comprehensive QA for Radiation Oncology (American Association of Physicists in Medicine Report No. 46), although not a comprehensive list, are national and international standards outlining the practice of radiation oncology. These resources provide programme guidance to improve quality, reduce risk, and strengthen accountability by addressing the key safety and quality issues of cancer care and oncology including investing in quality services, handling medications safely, building a prepared and competent team, providing safe and effective services, maintaining accessible and efficient information systems, monitoring quality, and achieving positive outcomes [7,8,20,21,22].

Conclusions

Radiation oncology programmes, organisations, and healthcare systems must overcome a number of challenges in order to establish a culture of safety and continuous quality improvement. Providing radiation medicine professionals with the appropriate resources, and equipping them with safety culture knowledge and quality tools, will promote engagement in quality and safety initiatives. Improving interdisciplinary communication, collaboration, and programmatic buy-in to the concepts of just culture and quality and safety change can be effected at the level of radiation medicine professionals, programme leadership, and the healthcare system. By effectively employing these strategies, a programme can work to improve its culture of quality and safety and positively impact person-centred care and treatment outcomes.

References

[1] Dsouza N, Holden L, Robson S, Mah K, Di Prospero L, Wong C, *et al.* Modern palliative radiation treatment: do complexity and workload contribute to medical errors? *Int J Radiat Oncol Biol Phys* 2012;84(1):43–48.
[2] Abdel-Wahab M, Rosenblatt E, Holmberg O, Meghzifene A. Safety in radiation oncology: the role of international initiatives by the international atomic energy agency. *J Am Coll Radiol* 2011;8(11):789–794.
[3] The Incident Analysis Working Group. *Canadian incident analysis framework*. Edmonton, Canada: Canadian Patient Safety Institute; 2012.
[4] Weller J, Boyd M, Cumin J. Teams, tribes and patient safety: overcoming barriers to effective teamwork in healthcare. *Postgrad Med J* 2014 Mar;90(1061):149–154.
[5] Bright K, Cooper C. Organization culture and the management of quality. *J Manag Psychol* 1993;8(6):21–27.
[6] Canadian Partnership for Quality Radiotherapy. *Quality assurance guidance for Canadian radiation treatment programs*. 2011. Available at: http://www.cpqr.ca/programs/quality-assurance/. [Accessed 4 March 2011].
[7] International Organization for Standardization. *ISO 9001 quality management*. 2015. Available at: https://www.bsigroup.com/en-GB/iso-9001-quality-management/. [Accessed 7 July 2017].
[8] Royal Australian and New Zealand College of Radiologists. Radiation Oncology Practice Standards. Available at: https://www.ranzcr.com/documents/441-tripartite-radiation-oncology-practice.../file. [Accessed 7 July 2017].
[9] Thomadsen B. Critique of traditional quality assurance paradigm. *Int J Radiat Oncol Biol Phys* 2008;71(1 Suppl): S166–S169. http://dx.doi.org/10.1016/j.ijrobp.2007.07.2391.
[10] Brundage M, Foxcroft S, McGowan T, Gutierrez E, Sharpe M, Warde P. A survey of radiation treatment planning peer-review activities in a provincial radiation oncology programme: current practice and future directions. *BMJ Open* 2013 Jul 31;3(7). http://dx.doi.org/10.1136/bmjopen-2013-003241. pii: e003241.

[11] Canadian Partnership for Quality Radiotherapy. *Quality assurance guidance for Canadian radiation treatment programs*. 2015. Available at: http://www.cpqr.ca/programs/quality-assurance/. [Accessed 9 March 2015].
[12] Cao Jeff, Brundage Michael, Donaldson Holly, Dunscombe Peter, Angers Crystal, Bird Louise, *et al*. Quality indicators for radiation treatment: a global perspective: 549. *Asia-Pacific J Clin Oncol* 2014;10(Supp. 9):59–60.
[13] Cooke David L, Dubetz Meina, Heshmati Rahim, Iftody Sandra, McKimmon Erin, Powers Jodi, *et al*. *A Reference guide for learning from incidents in radiation treatment*. Health Technology Assessment Initiative #22, Alberta Heritage Foundation for Medical Research; 2006. Available at: www.assembly.ab.ca/lao/library/egovdocs/2006/alhfm/153508.pdf. [Accessed 29 June 2017].
[14] Clark B, Brown R, Ploquin J, Kind A, Grimard L. The management of radiation treatment error through incident learning. *Radiother Oncol* 2010;95:344–349.
[15] Kapur Ajay, Goode Gina, Riehl Catherine, Zuvic Petrina, Joseph Sherin, Adair Nilda, *et al*. Incident learning and failure-mode-and-effects-analysis guided safety initiatives in radiation medicine. *Front Oncol* 2013;3:305.
[16] Bolderston A, Di Prospero L, French J, Church J, Adams R. A culture of safety: an international comparison of radiation therapists' error reporting. *J Med Imaging Radiat Sci* 2015;46(1):16–22.
[17] *Safer healthcare now! Improvement frameworks getting started kit*. Edmonton, Canada: Canadian Patient Safety Institute; 2015.
[18] Gillan C, Davis CA, Moran K, French J, Liszewski B. The quest for quality: principles to guide medical radiation technology practice. *J Med Imaging Radiat Sci* 2015;46(4):427–434. 46(1):16–22.
[19] Hannaford N, Mandel C, Crock C. Learning from incident reports in the Australian medical imaging setting: handover and communication errors. *Br J Radiol* 2013;86(1022):20120336.
[20] Accreditation Canada. *Cancer care*. 2016. Available at: https://accreditation.ca/cancer-care. [Accessed 29 June 2017].
[21] The International Atomic Energy Agency. *TECDOC-989 Quality assurance in radiotherapy*. 1995. Available at: http://www-pub.iaea.org/books/IAEABooks/5644/Quality-Assurance-in-Radiotherapy. [Accessed 7 July 2017].
[22] Kutcher Gerald J, Coia Lawrence, Gillin Michael, Hanson William F, Leibel Steven, Morton Robert J, *et al*. AAPM Report No. 46. Comprehensive QA for Radiation Oncology: report of AAPM radiation therapy committee task group 40. *Med Phys* 1994;21(4):581–618.