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Original article

Development of quality indicators to monitor radiotherapy care for men with prostate cancer: A modified Delphi method

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ABSTRACT

Background and purpose: Quality indicators (QIs) have been developed for many aspects of prostate cancer care, but are under-developed with regard to radiotherapy treatment. We aimed to develop a valid, relevant and feasible set of core QIs to measure quality of radiotherapy care in men with prostate cancer. **Materials and methods:** We used a RAND-modified Delphi process to select QIs that were regarded as both important and feasible measures of quality radiotherapy care. This involved two phases: (1) a literature review to identify a list of proposed QIs; and (2) a QI selection process by an expert panel ($n = 12$) conducted in a series of three rounds: two online questionnaires and one face-to-face meeting. The RAND criterion identified variation in ratings and determined the level of agreement after each round of voting. **Results:** A total of 144 candidate QIs, which included measures from pre-treatment to post-treatment and survivorship care were identified. After three rounds of voting, the panel approved a comprehensive set of 17 QIs, with most assessing a process of care ($n = 16$, 94.1%) and the remaining assessing a health outcome.

Conclusion: This study developed a core set of 17 QIs which will be used to report from the Prostate Cancer Outcomes Registry-Australia & New Zealand, to monitor the quality of radiotherapy care prostate cancer patients receive.

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The delivery of quality care has been recognised as an indispensable aspect of the healthcare system and important in achieving optimal health outcomes [1,2]. Best-practice guidelines distil evidence and provide recommendations to support clinicians on how quality care ought to be delivered. However, publishing guidelines do not ensure adherence, and suboptimal practice has been observed [3,4].

Quality indicators (QIs) derived from best-practice guidelines allow for standards of healthcare to be assessed, benchmarked and ultimately improved within and between providers [5].

Donabedian proposed a conceptual model which proposes that information about quality of care can be categorised according to a framework assessing healthcare structures, processes and outcomes [6]. Further to this, the Institute of Medicine proposed that quality of care is best assessed according to whether it is effective, efficient, accessible, patient-centred, equitable, and safe [7].

The Prostate Cancer Outcome Registry-Australia and New Zealand (PCOR-ANZ) was developed in 2012 as a clinical quality registry. In 2015 a set of QIs were agreed upon for reporting from the registry, based on the dataset for the national registry and following a review of existing published prostate cancer (CaP) QIs and evidence-based guidelines [8]. Despite 22% of men with localised disease receiving radiotherapy as monotherapy [9], the initial set failed to capture radiotherapy-specific QIs, limited by the sparse radiotherapy data fields in the dataset [8].

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In 2017, PCOR-ANZ developed capacity to import data fields from two large commercial radiotherapy information technology platforms, expanding the options available for the registry to develop radiotherapy-specific CaP QIs. This study was undertaken to develop consensus on a set of radiotherapy QIs which PCOR-ANZ could use to monitor quality of care.

Methods

A RAND-modified Delphi process was selected to identify and define radiotherapy focused QIs, combining evidence from guidelines with expert opinion [10]. This method has been widely used in the development of QIs across the field of healthcare [8,11,12]. The development process involved two phases: (1) Identifying a list of proposed QIs through a literature review and (2) the indicator selection process, conducted in a series of three rounds.

The principles guiding indicator selection were to select: (1) valid and important measures of radiotherapy care which are reflective of quality; (2) indicators spanning the continuum of CaP care (from pre-treatment to post-treatment and survivorship care); and (3) indicators with linkage to supporting high quality evidence or, in the case of novel indicators, to strong over-arching consensus.

Delphi panel members

A panel of content experts contributed to the indicator selection process. The panel comprised of radiation oncologists who were either the nominated clinical leaders of the PCOR-ANZ Steering Committee within their jurisdiction and endorsed by the Royal Australian and New Zealand College of Radiologists (RANZCR), or were nominated by the urologist clinical leader on the PCOR-ANZ Steering Committee. One urologist clinical leader from the PCOR-ANZ Steering Committee was invited to participate on the panel to provide an overall perspective and to provide expert advice on proposed QIs that had a surgical component. To be eligible, all clinicians were required to be currently practicing and treating patients with CaP, registered with the Australian Health Professions Regulation Authority, and actively involved in CaP research.

Phase 1: Literature review

Step 1. Developing a list of proposed indicators

International guidelines relevant to CaP or radiotherapy were reviewed to identify evidence-based recommendations. The guidelines included seven European [13–19], five Australasian [20–24], two Asian [25,26] and five American publications [27–31]. The OVID Medline database was searched to identify literature containing existing QIs relevant to CaP and radiotherapy care developed by research groups. Guideline recommendations were converted to quantitative QIs with proposed numerators and denominators developed by three authors (ET, JM, SE). Pre-assessment of the proposed QIs was conducted, and any indicators determined not measurable or quantifiable were removed.

Step 2. Development of supplementary material to assist panellists

A supplementary document was created to assist panellists in making an informed decision when selecting QIs. Indicators were stratified into structure, process and outcome quality domains

[6] and then further categorised into the Institute of Medicine's dimensions of healthcare [7]. The grade of evidence was recorded for each proposed QI. To accommodate for the different grading systems between guidelines, the grade of evidence was standardised and categorised by the reviewer ET (A, B, C, D, or 'no grade listed') and is listed in Appendix A. In situations where the grade of evidence differed between guidelines for the same indicator, the highest grade was selected.

Phase 2: Development of quality indicators

Step 3. Round one voting

Panellists were asked to use the supplementary document to assist in rating each proposed indicator on a Likert scale of 1–9 (1 = not important and 9 = very important) according to how important the indicator was in measuring quality of radiotherapy care and its association with improved patient outcomes. Indicators were presented in chronological order in terms of management – Pre-treatment; Treatment; Salvage treatment; Post-treatment/ Outcomes; and Information and Support. Panel members had the option in round one of not voting if the indicator was not within their expertise or they had difficulty understanding it. Panellists were also welcome to suggest QIs to be considered in round two of voting. Panellists were given 10 days to complete the round one voting process.

Step 4. Data analysis of round one voting and preparation for round two

Data were analysed according to the RAND criteria [10], and a traffic light system of *green*, *amber*, and *red* classified each indicator by their Median score (M) and Disagreement Index (DI), described in Table 1. The RAND DI quantified the level of disagreement between panellists for each of the indicators, with a lower score indicating a higher degree of agreement, and a $DI \geq 1$ indicating disagreement. Indicators were colour coded as green if they were considered highly important ($M \geq 8$) with little disagreement among panel members ($DI < 0.75$). Where panellists selected 'unable to comment' this was considered a null vote and the denominator was adjusted accordingly.

Step 5. Round two face-to-face meeting

Considering the Delphi method is an iterative process, results from the first round informed the key points of discussion and rating in the subsequent face-to-face round. All proposed indicators were discussed and addressed in isolation at this meeting, even if there was agreement in round one determining the QIs' inclusion or exclusion. At the end of each section panellists re-rated the importance for all indicators. Panellists were also asked to score the feasibility of collecting the data required to construct the numerator and denominator for the indicator, using the same Likert scale (1–9). As with round one, panellists were invited to nominate new indicators in round two. Inclusion, exclusion and the need for further discussion of each indicator was reviewed and confirmed during this round.

Step 6. Data analysis of round two voting and final confirmation

Provision existed for a third round of online voting on residual concerns or issues relating to proposed QIs. Panellists were given the opportunity to review the set of indicators after the second and third round of voting, along with their definition of numerators and denominators for final confirmation of the QI set.

Table 1

The criteria for indicator classification after round one voting.

Median	1–5.5	6–7.5	8–9
Agreement $DI \leq 0.75$	Excluded (Red)	To be discussed (Amber)	Included (Green)
Disagreement $DI > 0.75$	To be discussed (Amber)	To be discussed (Amber)	To be discussed (Amber)

DI: Disagreement Index.

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