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Preliminary communication

Improving radiation oncology through clinical audits: Introducing the IROCA project

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ABSTRACT

As radiotherapy practice and processes become more complex, the need to assure quality control becomes ever greater. At present, no international consensus exists with regards to the optimal quality control indicators for radiotherapy; moreover, few clinical audits have been conducted in the field of radiotherapy. The present article describes the aims and current status of the international IROCA "Improving Radiation Oncology Through Clinical Audits" project. The project has several important aims, including the selection of key quality indicators, the design and implementation of an international audit, and the harmonization of key aspects of radiotherapy processes among participating institutions. The primary aim is to improve the processes that directly impact clinical outcomes for patients. The experience gained from this initiative may serve as the basis for an internationally accepted clinical audit model for radiotherapy.

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1. Background

In recent decades, the effectiveness of radiotherapy has increased considerably due to the advent of ever more powerful, more precise technologies, such as intensity-modulated radiotherapy (IMRT). The use of more sophisticated technologies has also increased the complexity of radiotherapy delivery. As a result, every step in the radiotherapy process has become more demanding and multifaceted, requiring strict attention to detail to assure that the high doses of radiation are delivered precisely to the treatment target. To ensure the quality of radiotherapy delivery and treatment, it is essential to monitor the process carefully and systematically, with routine and frequent checks and assessments. However, the development and implementation of quality control measures have not kept pace with the remarkable technological advances achieved in recent years.[1–4]

A common approach to quality control in cancer care involves the use of quality indicators. Ideally—given the wide variety of processes and techniques involved in treating different types of cancer—these indicators should be specifically designed (or adapted to) each tumour type. In this sense, the availability of a set of internationally recognized and standardized indicators to permit international comparisons among radiotherapy centres would be highly desirable. Yet experience in this area remains limited, with no consensus with regard to the optimal indicators for radiotherapy.[3] Indeed, although several different groups[3–7] have attempted to identify a core group of quality indicators for radiotherapy, no widely-accepted or internationally-recognized core set of indicators is available at present.

While quality indicators are important to ensuring quality control, to be of any real value these indicators must be applied to actual clinical practice—preferably by external evaluators. This process, known as a clinical audit, provides an opportunity to conduct an in-depth analysis of the procedures and processes governing patient care. To date, such clinical audits have been used only sparingly in radiotherapy,[2,3,8] although measures to increase their use have been taken, including a European Union directive requiring their use.[4]

Interest in developing and implementing a system of quality standards in radiotherapy has increased greatly in recent years.[9–12] Nevertheless, only a limited number of clinical audits, including one by our group,[2] have been conducted to date.[2,13–15] It is in this context that the multi-institutional, international IROCA (*Improving quality in Radiation Oncology through Clinical Audits*; www.iroca.eu) project was born. The aim of this project is to compare radiotherapy processes among participating institutions [the Wielkopolskie Centrum Onkologii (WCO) in Poznan, Poland; the Institut Català d'Oncologia (ICO) in L'Hospitalet (Barcelona), Spain; the Instituto Português de Oncologia (IPO) in Porto, Portugal; and the Università degli Studi del Piemonte Orientale (UNIUPO) in Novara, Italy] using a core set of quality indicators. To our knowledge, this is the first project of its kind and scope.

In the present paper, we provide an overview of this international project, which involves the design and implementation of a clinical audit to assess adherence to a set of core quality indicators to evaluate departmental/institutional structure, radiotherapy processes and procedures, and clinical outcomes among the five participating institutions. The overall aim of the project is to improve quality and safety in radiation oncology by promoting adherence to quality indicators and by harmonizing radiotherapy processes among the participating institutions. Ultimately, the main objective is to improve clinical outcomes for patients. The approach used in this project to harmonize radiotherapy processes among different institutions may serve to promote a greater use of clinical audits in radiotherapy in Europe.

2. Methods & discussion

This study was modelled on two previous studies. The first was performed jointly by the ICO (Catalan Institute of Oncology) and the WCO (Greater Poland Cancer Centre), with results published in 2014.[2] In that study, which was conducted—in part—to generate more practical experience in quality control, the clinical audit assessed adherence to seven quality indicators for preoperative rectal cancer treatment. This experience was invaluable, both in improving key elements of care at the audited institutions, and in learning about how to develop and conduct a comprehensive clinical audit, a challenging and highly complex task. In addition, in the year 2015, the ICO (Catalonia, Spain) performed an in-house clinical audit among their three radiotherapy centres (in Badalona, L'Hospitalet, and Girona). Results from that study have not yet been published. Nevertheless, the combined experience of these two previous studies has helped to guide us in developing the model described here.

2.1. *Organization of the project*

A Steering Committee (SC) consisting of senior members of the IROCA project was formed to guide the development of this project. The IROCA members held a series of meetings to establish the aims and protocol for the study, including selection of the target cancer types for the audit. After a careful review of the literature and based on previous experience, the committee selected the most appropriate quality control indicators for those tumour sites and for general radiotherapy processes. A Technical Committee (TC) was constituted to perform the statistical analysis and to develop the reports. A detailed study protocol, including the questionnaire and all other relevant data, has been developed. The project's key aims are summarized in Table 1.

2.2. *Cancer types for evaluation*

Two cancer sites, prostate (ICD-9:185.9 and ICD10: C61.9) and rectal cancer (ICD-9: 154.1; ICD-10: C20.9) were selected for the clinical audit.

These specific cancer types were chosen due to their high incidence rate,[16] the relevant role of radiotherapy in their treatment, our prior experience, and because all participating institutions treat large numbers of patients for these two cancer types. In the case of rectal cancer, the high incidence and mortality rates associated with this cancer make it an