

Clinical Investigation: The Profession

Impact of Quality Assurance Rounds in a Canadian Radiation Therapy Department

Shilo Lefresne, BSc, MD,^{*,†} Ivo A. Olivetto, MD, FRCPC,^{*,†} Howard Joe, MD, FRCPC,^{*,†}
Paul A. Blood, BM, FRCPC, PhD,^{*,†} and Robert A. Olson, MD, FRCPC, MSc^{†,‡}

^{*}Radiotherapy Department, BC Cancer Agency, Vancouver Island Centre, [†]Radiotherapy Department, University of British Columbia, Vancouver; and [‡]Radiotherapy Department, BC Cancer Agency, Centre for the North, Prince George, British Columbia, Canada

Received Sep 3, 2012, and in revised form Oct 8, 2012. Accepted for publication Oct 8, 2012

Summary

This study analyzed a prospectively documented database of a department's quality assurance rounds. It highlighted the following: 1% of the plans reviewed required modifications, certain tumor sites were more prone to inconsistencies in planning, and an inverse relationship existed between a recommendation for modification and years of experience of the treating radiation oncologist. These findings highlight the vital role that quality assurance rounds play in a radiation therapy department's quality assurance program.

Purpose: Quality assurance (QA) programs aim to identify inconsistencies that may compromise patient care. Radiation treatment planning is a well-documented source of variation in radiation oncology, leading many organizations to recommend the implementation of QA rounds in which radiation therapy plans are peer reviewed. This study evaluates the outcome of QA rounds that have been conducted by a radiation therapy department since 2004.

Methods and Materials: Prospectively documented records of QA rounds, from 2004 to 2010, were obtained. During rounds, randomly selected radiation therapy plans were peer reviewed and assigned a grade of A (adequate), B (minor suggestions of change to a plan for a future patient), or C (significant change required before the next fraction). The proportion of plans that received each recommendation was calculated, and the relationship between recommendations for each plan, tumor site, and mean years of experience of the radiation oncologist (RO) were explored. Chart reviews were performed for each plan that received a C.

Results: During the study period, 1247 plans were evaluated; 6% received a B and 1% received a C. The mean RO years of experience were lower for plans graded C versus those graded A ($P = .02$). The tumor sites with the highest proportion of plans graded B or C were gastrointestinal (14%), lung (13%), and lymphoma (8%). The most common reasons for plans to receive a grade of C were inadequate target volume coverage (36%), suboptimal dose or fractionation (27%), errors in patient setup (27%), and overtreatment of normal tissue (9%).

Conclusions: This study demonstrated that QA rounds are feasible and an important element of a radiation therapy department's QA program. Through peer review, plans that deviate from a department's expected standard can be identified and corrected. Additional benefits include identifying patterns of practice that may contribute to inconsistencies in treatment planning and the continuing education of staff members who attend. © 2013 Elsevier Inc.

Introduction

The World Health Organization defines quality assurance (QA) in radiation therapy as "all procedures that ensure consistency of the

medical prescription, and safe fulfillment of that prescription, as regards to the dose to the target volume, together with minimal dose to normal tissue, minimal exposure to personnel and adequate patient monitoring aimed at determining the end result of the treatment" (1). QA programs therefore aim to detect

Reprint requests to: Robert A. Olson, 3333 University Drive, Prince George, BC V2N 4Z9. Tel: (250) 645-7300; Fax: (250) 645-7331; E-mail: rolson2@bccancer.bc.ca

Conflict of interest: none.

Acknowledgment—The authors thank Pam Grewal for assistance with data collection.

inconsistencies that may compromise patient care at every step of the radiation therapy process (2, 3).

Radiation treatment planning is a well-documented source of inconsistency (2). Significant variability exists in choice of patient position, prescribed dose and fractionation, beam arrangement, target volume delineation, and critical organ dose limits. One of the most critical steps in treatment planning is target volume selection, and this has consistently been shown to be subject to significant interpractitioner and intrapractitioner variability for a wide variety of tumor sites (2, 4-6). In recognition of this variability and its potential to affect patient outcomes, several organizations including the American Association of Physicists in Medicine, the European Organization for Research and Treatment of Cancer, and the Canadian Association of Radiation Oncology (CARO), have recommended regularly reviewing radiation therapy plans in the format of interdisciplinary peer review QA rounds (2, 7-9).

A British Columbian radiation therapy department has been prospectively documenting the details of its QA rounds since 2004. The purpose of this study was to assess the outcomes of the rounds. The primary objectives were to determine the proportion of plans that received recommendations for modification, to determine the reason for the recommendation, and to assess the relationship between the grade given for each plan, tumor site, and mean years of experience of the planning radiation oncologist (RO).

Methods and Materials

The QA rounds in this study took place over a 1-hour period on a weekly basis, excluding holidays and summer months. All external-beam radiation therapy plans approved for treatment in the 5 business days before rounds are compiled. Approximately 10 plans are randomly selected for discussion and review. The planning RO provides a summary of the patient's oncologic history and rationale for the plan, and a radiation therapist (RT) presents the treatment plan. After discussion by an interdisciplinary team, the plan is assigned a grade of A, B, or C. "A" plans are adequate and do not require modification. "B" plans are satisfactory to continue treatment but receive suggestions for potential changes that should be incorporated into similar plans in the future. "C" plans are unsatisfactory and require correction before the next fraction of radiation therapy is delivered.

A prospectively maintained electronic database containing the results of the QA rounds was obtained for the dates of March 2004 to February 2011. The database included the name of the treating RO, the primary tumor site, the treatment intent (curative vs palliative), and the grade assigned to the plan after review. A surrogate for the years of experience of each RO was calculated by subtracting the year of graduation from medical school from the date on which the plan was reviewed. A numeric coding system was used to maintain RO anonymity. To facilitate statistical analysis, primary tumor sites were allocated into 12 larger tumor categories, which included breast, central nervous system, gastrointestinal (GI), gynecologic, genitourinary (GU), head and neck, lung, lymphoma, primary unknown, sarcoma, skin, and thymus cancers.

Individual clinical and radiation therapy records were reviewed for each case that received a grade of C. Information analyzed included the oncologic history of the patient, the radiation therapy prescription, target volumes, dose-volume histograms, and documentation from the ROs and RTs during the patient's treatment.

This information was compiled to determine the changes that were made to the C plans.

Statistical analyses were performed with SPSS 14.0 software. Descriptive statistics were used to determine the distribution of tumor sites, the years of practice of ROs, and the proportion of plans that received a recommendation for change. χ^2 tests were used to determine the relationship between tumor site and recommendation for change. Analysis of variance statistics were used to determine the relationship between years of experience and the recommendation for change.

The University of British Columbia Research Ethics Board provided approval for the study.

Results

General QA rounds characteristics

The first QA rounds were held on March 9, 2004. Between March 2004 and February 2011, a total of 1247 completed radiation therapy plans were available for review, in 135 sessions. A mean of 9 plans were reviewed during each 1-hour session; 85% of the plans were of curative intent, and the remainder were palliative. The reviewed plans represented 13% of all radical plans and 2% of all palliative plans that were completed by the department during the study period. Among 12 tumor sites examined, plans of patients with cancers of the breast (31%), GU (19%), and GI (13%) sites were the most commonly reviewed (Fig. 1).

Plan grades

The proportions of plans that received a recommendation of A, B, or C were 93%, 6%, and 1%, respectively. The tumor sites with the highest proportion of plans graded either B or C were GI (14%), lung (13%), and lymphoma (8%) (Fig. 2). Rectal primaries made up the largest proportion of the GI plans that received a grade of either B or C.

Relationship between oncologist experience and QA round outcomes

The database included 21 radiation oncologists including full-time, part-time, and locum staff. Nine staff members (43%)

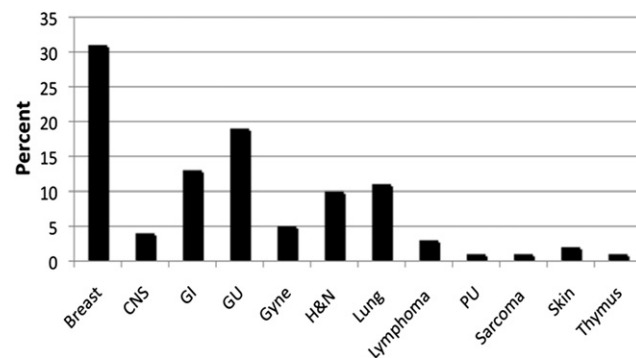


Fig. 1. Distribution of primary tumor sites reviewed during study period. GU = genitourinary; Gyne = gynecologic; H&N = head and neck; PU = primary unknown.

Download English Version:

<https://daneshyari.com/en/article/8223072>

Download Persian Version:

<https://daneshyari.com/article/8223072>

[Daneshyari.com](https://daneshyari.com)