ORIGINAL ARTICLE

Multi-Institutional Implementation and Evaluation of a Curriculum for the Medical Student Clerkship in Radiation Oncology

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Abstract

Purpose: Radiation oncology curriculum development is challenging because of limited numbers of trainees at any single institution. The goal of this project is to implement and evaluate a standardized medical student clerkship curriculum following the multi-institutional cooperative group research model.

Methods: During the 2013 academic year, a standardized curriculum was implemented at 11 academic medical centers consisting of three 1-hour lectures and a hands-on radiation treatment planning workshop. After the curriculum, students completed anonymous evaluations using Likert-type scales (1 = "not at all" to 5 = "extremely") and free responses. Evaluations asked students to rate their comfort, before and after the curriculum, with radiation oncology as a specialty, knowledge of radiotherapy planning methods, and ability to function as a radiation oncology resident. Nonparametric statistical tests were used in the analysis.

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Results: Eighty-eight students at 11 academic medical centers completed the curriculum de novo, with a 72.7% (64 of 88) survey response rate. Fifty-seven students (89.1%) reported intent to pursue radiation oncology as their specialty. Median (interquartile range) student ratings of the importance of curricular content were as follows: overview, 4 (4-5); radiation biology/physics, 5 (4-5); practical aspects/emergencies, 5 (4-5); and planning workshop, 4 (4-5). Students reported that the curriculum helped them better understand radiation oncology as a specialty (5 [4-5]), increased specialty decision comfort (4 [3-5]), and would help the transition to radiation oncology residency (4 [4-5]). Students rated their specialty decision comfort significantly higher after completing the curriculum (4 [4-5] versus 5 [5-5]; $P < .001$).

Conclusions: A national standardized curriculum was successfully implemented at 11 academic medical centers, providing proof of principle that curriculum development can follow the multi-institutional cooperative group research model.

Key Words: Radiation oncology, undergraduate medical education, curriculum, medical students

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INTRODUCTION

Medical student core rotations in internal medicine, surgery, obstetrics and gynecology, pediatrics, family medicine, and psychiatry typically have well-structured didactic curricula to complement the clinical experience. These curricula are routinely reviewed and improved on the basis of student feedback. However, curriculum development for undergraduate and graduate medical education in specialties and subspecialties, such as radiation oncology, is challenging because of limited numbers of trainees at any single institution. Stepwise models of curriculum development rely on evaluation of targeted needs and feedback, which are hampered by restricted numbers of participants [1]. Medical students applying for residency in radiation oncology complete a median of three clerkships at multiple institutions during their final year of medical school. However, the majority of these clerkships are reported to have no structured didactic curricula for the rotating medical students [2,3]. On the basis of these targeted needs assessments, a structured didactic pilot curriculum was developed for the radiation oncology clerkship and successfully implemented at two institutions in 2012 [4].

To overcome the challenge of limited numbers of trainees at the two pilot institutions, further evaluate the curriculum, and disseminate the curriculum to a wider audience, a multi-institutional collaborative group research model was adapted to educational curriculum development. The multi-institutional collaborative research model has been used successfully for many years to improve patient care for relatively uncommon diseases by pooling patients from multiple institutions around the country or the world to increase the total number of patients treated during a given time frame [5-7]. We hypothesized that a similar model could be applied to subspecialty curriculum development to address the aforementioned clerkship educational gap by exposing a larger number of trainees to a novel curriculum. The Radiation Oncology Education Collaborative Study Group was therefore established with the goal of using curriculum development for the medical student clerkship as a test case for multi-institutional collaborative radiation oncology curriculum development. Thus, the initial 2-institution pilot radiation oncology clerkship curriculum was expanded to 11 selected academic medical centers within the United States in 2013. Here we report the results of the expanded curriculum.

METHODS

Initial development of the curriculum has been previously described [4]. In brief, Kern et al's [1] six-step approach to medical education curriculum development, as outlined in Table 1, was used to develop a curriculum for the radiation oncology clerkship. Before developing the curriculum, a targeted needs assessment was completed to characterize medical students' perceptions of the radiation oncology clerkship experience and to determine what educational content to include in the curriculum [2]. A structured didactic pilot curriculum was designed to teach medical students the fundamentals of clinical radiation oncology, as previously described [4]. The curriculum consisted of three 1-hour lectures on: (1) an overview of radiation oncology, including a history of the specialty, types of treatments, and basic clinic flow; (2) fundamentals of radiation biology and radiation physics; and (3) practical aspects of radiation treatment simulation and planning

Table 1. Kern et al's [1] six-step approach to medical education curriculum development

1. Problem identification and general needs assessment
2. Targeted needs assessment
3. Goals and objectives
4. Educational strategies
5. Implementation
6. Evaluation and feedback