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Original Article

# A Multidisciplinary Evaluation of a Web-based eLearning Training Programme for SAFRON II (TROG 13.01): a Multicentre Randomised Study of Stereotactic Radiotherapy for Lung Metastases

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## Abstract

*Aims:* In technically advanced multicentre clinical trials, participating centres can benefit from a credentialing programme before participating in the trial. Education of staff in participating centres is an important aspect of a successful clinical trial. In the multicentre study of fractionated versus single fraction stereotactic ablative body radiotherapy in lung oligometastases (TROG 13.01), knowledge transfer of stereotactic ablative body radiotherapy techniques to the local multidisciplinary team is intended as part of the credentialing process. In this study, a web-based learning platform was developed to provide education and training for the multidisciplinary trial teams at geographically distinct sites.

*Materials and methods:* A web-based platform using eLearning software consisting of seven training modules was developed. These modules were based on extracranial stereotactic theory covering the following discrete modules: Clinical background; Planning technique and evaluation; Planning optimisation; Four-dimensional computed tomography simulation; Patient-specific quality assurance; Cone beam computed tomography and image guidance; Contouring organs at risk. Radiation oncologists, medical physicists and radiation therapists from hospitals in Australia and New Zealand were invited to participate in this study. Each discipline was enrolled into a subset of modules (core modules) and was evaluated before and after completing each module. The effectiveness of the eLearning training will be evaluated based on (i) knowledge retention after participation in the web-based training and (ii) confidence evaluation after participation in the training. Evaluation consisted of a knowledge test and confidence evaluation using a Likert scale.

*Results:* In total, 130 participants were enrolled into the eLearning programme: 81 radiation therapists (62.3%), 27 medical physicists (20.8%) and 22 radiation oncologists (16.9%). There was an average absolute improvement of 14% in test score ($P < 0.001$) after learning. This score improvement compared with initial testing was also observed in the long-term testing (>4 weeks) after completing the modules ($P < 0.001$). For most there was significant increase in confidence ($P < 0.001$) after completing all the modules.



*Key words:* Clinical Trials; eLearning; image-guided radiotherapy; stereotactic radiotherapy

## Introduction

Quality assurance during technically demanding radiotherapy trials has been shown by such trials as the TROG

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98.02 phase III [1] and the RTOG 9704 [2] to critically affect cancer outcomes and the likelihood of trial success. As more multicentre clinical trials of advanced technologies open, a high-quality credentialing programme can ensure that treatment techniques are delivered according to protocol. The importance of the credentialing process has been highlighted in the Gynecologic Oncologic Group Protocol 165 trial, which found that major protocol deviations were observed only in centres that did not receive credentialing compared with those centres that were credentialed [3].

In establishing a radiotherapy credentialing programme, a challenge for the trial management committee is to provide a clear protocol that can be interpreted in the same way by all participating hospitals. Co-operative clinical trials groups, such as the Radiation Therapy Oncology Group and European Organisation for Research and Treatment of Cancer, have published recommendations [4,5] for establishing credentialing requirements. These recommendations for radiotherapy-based clinical trials emphasise the participation in a dosimetry audit as well as a planning dry-run exercise. For stereotactic ablative body radiotherapy (SABR), the challenge is the various levels of SABR experience in participating centres. Provision of education and training can therefore appeal to institutions where SABR is new. By mandating participation in a knowledge credentialing process, a minimum educational benchmark is ensured.

Web-based training is attractive because it can be easily delivered to large groups of participants in a relatively cost-effective way. The effectiveness of web-based training in a multicentre clinical trial setting has been reported by Foroudi *et al.* [6]. This report described the effectiveness of an eLearning platform that was part of the credentialing programme for the multicentre study of online adaptive radiotherapy (TROG 10.01) [7]. However, the effectiveness of such an education platform for a multidisciplinary audience has yet to be presented. Based on the success of this platform, our study will report on the effectiveness of web-based training in a trial of lung stereotactic radiotherapy. The TROG 13.01/ALTG 13.001 SAFRON II trial is a randomised phase II multicentre clinical trial comparing the toxicity of a single 28 Gy in one fraction regimen of SABR versus a 48 Gy in four fraction regimen (clinicaltrials.gov NCT01965223) [8]. The study target accrual is 84 patients in order to investigate the primary end point, which is the number of participants experiencing less than or equal to 5% toxicity at 12 months after treatment. As part of the development phase of this multicentre study, training and education for the multidisciplinary team (radiation oncologist, medical physicist and radiation therapist) was a component of the participating centre credentialing process.

The aims of this study were to investigate among radiation oncologists, medical physicists and radiation therapists: (i) knowledge retention of stereotactic body radiotherapy principles and (ii) individual self-confidence rating before and after eLearning intervention.

## Materials and Methods

### *Participants*

Institutional ethics board approval was received for this study. Radiation oncologists, medical physicists and radiation therapists from Australian and New Zealand centres who expressed interest in the SAFRON II study were invited to participate in the eLearning programme. A full protocol was provided to all participants who agreed with the eLearning programme.

### *Module Development*

Training modules for lung SABR radiotherapy were developed to cover all aspects of the clinical pathway of a patient undergoing SABR treatment. A multidisciplinary review team made up of radiation oncologists, medical physicists and radiation therapists determined the core topics for the curriculum. Each module was written by two members from the most relevant profession. Upon completion of the modules, the content was sent out for review by two peers with a mixture of SABR experience. All modules were created in Microsoft PowerPoint™ before being converted into web-based training modules. The learning platform was based on the Adobe Connect™ (Adobe Systems Inc. San Jose, CA, USA) and Adobe eLearning software suite, which allowed mixed media to be used when presenting the content. Specific details for this platform have been previously published [6].

Seven modules were developed to form the curriculum that could be accessed by all participants. For each professional stream, fundamental core modules were determined. Core modules were mandatory for completion by the respective discipline with a testing component before and after participation in that module. Table 1 provides a high level summary of the module content as well the profession assigned for evaluation after the module.

### *Pre-/Post-eLearning Design*

For each core module, with the exception of *Quality assurance*, a bank of 10 multiple-choice questions was created. Each question had four possible answers, of which only one was the correct answer. Each question was designed to be of similar difficulty level as the others within each module. Before starting the modules, participant demographic details were entered into the online database, which included years of experience (within their discipline), institution and state/territory of origin, and discipline (radiation oncologist, medical physicist, radiation therapist).

Before each examinable module, the first five of the 10 available questions were tested. The same questions were given to all participants. At the end of each examinable module, all 10 questions were examined. This was to assess short-term knowledge retention. Four weeks after the

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