Improving the quality of radiation oncology: 10 years’ experience of QUATRO audits in the IAEA Europe Region

Joanna Izewska a,⇑, Mary Coffey b, Pierre Scalliet c, Eduardo Zubizarreta a, Tania Santos a, Ioannis Vouldis a, Peter Dunscombe d

a International Atomic Energy Agency, Vienna International Centre, Vienna, Austria; b Discipline of Radiation Therapy, School of Medicine, Trinity Centre for Health Sciences, St. James’ Hospital, Dublin, Ireland; c Department of Radiotherapy, Cliniques Universitaires Saint Luc, Université Catholique de Louvain, Brussels, Belgium; d University of Calgary, Canada

ORIGINAL ARTICLE

Abstract

Background and purpose: The IAEA has developed a methodology for comprehensive quality audits of radiotherapy practices called Quality Assurance Team for Radiation Oncology (QUATRO). This study explores the factors that impacted quality of care among QUATRO audited centres in the IAEA Europe Region.

Materials and methods: The 31 QUATRO reports collected over 10 years include extensive data describing the quality of radiotherapy at the audited centres. A coding key was developed to aggregate and review these data in terms of recommendations for improvement and positive findings (commendations).

Results: Overall 759 recommendations and 600 commendations were given. Eight centres recognized as centres of competence differed from other centres mostly because they operated complete quality management systems and were adequately staffed. Other centres had excessive staff workloads and many gaps in the process of care. Insufficient equipment levels were prevalent. Patient centredness, communication, dosimetry, quality control and radiation protection were frequently commended by QUATRO.

Conclusions: This analysis points to barriers to quality care such as insufficient staffing, education/training, equipment and lack of quality management. It highlights the correlation between the human resources availability and quality of care. It has also identified common action items for enhancing quality of radiotherapy programmes in the Region.

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The Global Task Force on Radiotherapy for Cancer Control has recently published its report highlighting the shortage of radiotherapy treatment facilities worldwide [1]. While establishing capacity has to be the first priority, the quality of the service provided by radiotherapy programmes is the major determinant of outcome for patients.

Although a universally accepted, specific definition of quality in radiotherapy is lacking, the provision of quality treatment is the aspiration of the radiotherapy community [2–4]. Assuring the quality of radiotherapy treatment is largely carried out within the clinical programme itself. However, there is considerable value in including an independent, external review as a component of quality management programmes [5–7].

The IAEA has contributed to the quality of radiotherapy worldwide since 1969 when the IAEA/WHO postal dosimetry audit was introduced [8]. While accurate radiation dosimetry is a necessary condition for quality radiotherapy it is not, of itself, a sufficient condition. Degradation of quality can clearly enter the radiotherapy care path in many places besides machine calibration. Given the IAEA experience in dosimetry auditing over many years, requests were received to conduct audits of clinical practices. In response, the IAEA developed the Quality Assurance Team for Radiation Oncology (QUATRO) audit methodology [9] which has been endorsed by professional societies and recognized by the European Commission in its guidelines for clinical audits [10].

To date 89 IAEA QUATRO audits have been conducted in 77 radiotherapy centres in Europe, Asia, Africa and Latin America. The QUATRO methodology is also used by national audit programmes in several countries both within Europe, e.g. Belgium [11] and beyond, e.g. Philippines, Indonesia and Israel.

We report on the first 10 years of QUATRO experience in the IAEA Europe Region (defined as the European countries eligible
to participate in the IAEA Technical Cooperation programme) with 31 centres in 21 countries audited. It represents the most comprehensive analysis of the quality of radiotherapy practices in the IAEA Europe Region available to date, including strengths, areas for improvement and needs of audited centres.

The primary aim of this present study was to identify and discuss the factors that impacted the quality of care in the audited centres. Observations presented here are potentially relevant to other centres in similar circumstances.

Materials and methods

The QUATRO methodology

QUATRO audits are organized by the IAEA in response to voluntary requests by eligible radiotherapy centres. They draw on high level international experts with broad experience in the field who comprise the auditing teams for QUATRO missions. Teams are composed of a radiation oncologist (RO), medical physicist (MP) and RTT. They receive specialized training in order to ensure consistency in the auditing approach among the teams and between geographical regions. In European audits, 26 different QUATRO experts participated (10 ROs, 8 MPs, 8 RTTs).

The QUATRO audit methodology incorporates a predefined structure with 37 check lists that guide the audit process and facilitate a standardized approach to peer review of the audited centre’s infrastructure, patient and equipment related procedures, quality assurance and safety programmes, as well as professional training programmes [9]. The audit is based on staff interviews, reviews of documentation and observation of radiotherapy practices, carried out over 5 days. The health policy and economic context, within which the radiotherapy services are embedded, are also evaluated. In addition, the QUATRO physics auditor makes dosimetric measurements using IAEA equipment. QUATRO teams are assisted in their assessments by guidance for best radiotherapy practices outlined in IAEA publications [12–14] and other publicly available recommendations [15–18]. Several of these recommendations, including accreditation programmes, have been discussed by Donaldson et al. [19].

An important deliverable from a QUATRO audit is an assessment of practice quality: strengths were acknowledged and areas for improvement identified by auditors. Some centres were recognized as operating at a high level of competence (denoted as ‘CC’ in this paper). A CC is assessed as being capable of delivery of sustainable services to a level that can serve as a model for other radiotherapy services representing the level of practices achievable in the country. Figs. 2–4 display key parameters of the audited centres showing great variation in workload, equipment and staffing levels. The heterogeneity apparent with these characteristics has been observed also at the national levels in Europe [20–22]. Due to this heterogeneity data collected in this study can be considered representative of the various levels of care in the Region.

Results

Profiles of the audited radiotherapy centres

The QUATRO programme generated great interest among countries in the IAEA Europe Region. Among 89 QUATRO audits in all world regions, 31 audits were conducted in 21 European countries (Fig. 1) with 14% (31/227) of all centres in the region participating. Centres which requested an audit were facilitated. Centres audited belong mostly to the public sector and include a wide spectrum of human and capital resources, extending from small to large centres and using radiotherapy technology from basic to advanced. Seventeen were national cancer centres with the infrastructure and radiotherapy services representing the level of practices achievable in the country. Figs. 2–4 display key parameters of the audited centres showing great variation in workload, equipment and staffing levels. The heterogeneity apparent with these characteristics has been observed also at the national levels in Europe [20–22]. Due to this heterogeneity data collected in this study can be considered representative of the various levels of care in the Region.

Findings

Auditors were very cognizant of the need to provide a balanced view of the programmes they were auditing. Hence, local strengths were identified as well as opportunities for improvement. Table 2 summarizes the findings from 31 European QUATRO audits structured according to the coding key developed for this project. Altogether 600 commendations and 759 recommendations for improvement were analysed.

Eight out of 31 centres were designated as CCs through the QUATRO programme on the first audit round and additionally two more centres were recognized as CCs in follow up audits. Of the total 600 commendations, 220 were given to the 8 CCs in the first audit (average 27.5 per centre) and 380 to the 23 other centres (average 16.5 per centre). Correspondingly, CCs received 82 recommendations (average 10.3 per centre) while the other centres received 677 recommendations (average 29.4 per centre). The results of a two-tailed Mann–Whitney test for the numbers of commendations and recommendations returned the p-values of 0.032 and 0.003, respectively, confirming the differences between CCs and others are statistically significant.

More information on QUATRO findings is given in the supplementary material

To extract the main messages from this huge amount of data, rows indicated in green in Table 2 highlight those topics which attracted at least twice as many commendations (C) as recommendations (R) \(C/(C+R) \geq 0.667\). Yellow indicates categories for
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امکان دانلود نسخه تمام متن مقالات انگلیسی
امکان دانلود نسخه ترجمه شده مقالات
پذیرش سفارش ترجمه تخصصی
امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
امکان دانلود رایگان ۲ صفحه اول هر مقاله
امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
دانلود فوری مقاله پس از پرداخت آنلاین
پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات