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Value-based radiotherapy – A radiation therapist perspective

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Abstract

While radiation therapy is essential in cancer care, up to 30% of healthcare is considered low value. Healthcare professionals should work to increase the value of the services. This paper aims to discuss how radiation therapists (RTTs) can contribute to value-based radiotherapy. A selection of literature is used to underpin the discussion. RTTs potential contributions to value-based radiotherapy are discussed through three overarching mechanisms: 1- avoiding low-value care, 2- altering the benefit–risk balance of justified services, and 3- increasing accessibility and efficiency. Finally, RTTs cross-cutting contributions are discussed. Examples where RTTs can contribute to value-based radiotherapy are patient management, use of technology, incident reporting, and research and innovations. RTTs are in a unique position to increase the value of radiotherapy services. However, many barriers exist. There is a need for a value-based culture. Leaders of radiotherapy departments must acknowledge RTTs capacities to increase value of the services

Introduction

Radiation therapists (RTTs) play a key role in treatment planning and delivery in radiotherapy. In a systematic review, the most reported outcomes from radiation therapists' advanced practice are enhanced service capacity, higher patient satisfaction, and safety maintenance (1). These are all factors associated with high value care. While RTTs are essential in providing high value care to patients, they are also key in work aimed at reducing services of lower value. This paper adds to the debate of value-based healthcare, by providing a radiation therapists' perspective on value-based radiotherapy. Based on a

selection of relevant literature, this paper aims to discuss how RTTs can contribute to value-based radiotherapy.

Background

Radiotherapy is essential in cancer care, and it is estimated that about 39 % of all cancer patients need radiotherapy (2). Radiotherapy adds value to the patient as it prevents and/or delays cancer development, cures patients and reduces symptoms. Accordingly, radiotherapy prolongs life and increases quality of life. However, a basic paradox of healthcare exists as there are underuse of effective health services while there is an overuse of services of low value (3). It has been estimated that about 30% of healthcare is low-value services (where benefits do not outweigh harm and costs), while about 10% of healthcare is considered harmful (4). Radiotherapy has accordingly potential to harm patients and reduce quality of life.

Value in healthcare does not depend on input, but is measured by the outcome achieved (5). Value-based radiotherapy is not about reducing costs, but more importantly about increasing the value of the services that are delivered. In a value-based healthcare system, the term value can be divided into four pillars; personal value, technical value, allocative value and societal value (6). Consequently, high-value care perceived by the individual might not be perceived of value by society and vice versa. Such various perspectives must be balanced in clinical practice. Moreover, what constitutes value might differ from country to country and from region to region. For example, Sharma et al. (7) performed a study attempting to reduce daily imaging in palliative radiotherapy. This practice is perceived low-value in the US as the national guidelines regards daily imaging as unnecessary for palliative patients as it can increase treatment time and expense for patients in distress (7). However, this practice contrasts with the increasing use of daily imaging for treatment verification around the globe (8-10).

The ESTRO-HERO value-based radiotherapy project aims to assess value of radiotherapy innovations and to support clinical implementation and equitable access (11). This is highly warranted. Moreover, the project seeks to define the magnitude of evidence needed to support clinical implementation (11). Still, removing or reducing the use of services that are ineffective or even harmful is equally important. Research within other fields of healthcare has demonstrated this to be difficult, as many barriers for change exist, both at the organizational and personal level (12, 13).

RTTs work in the sphere between the radiation oncologist and the medical physicist and are involved in both technical and patient management aspects in radiotherapy. The RTTs act therefore as a link between theory and practice, for example by being the ones' who actual delivers the "theoretical treatment plan" to the patient. Hence, RTTs must assess if the treatment regime or treatment plan, which in theory is the best for the patient, indeed is the best in real life.

Accordingly, RTTs are in a unique position to contribute to value-based radiotherapy at the local level. In this paper, their contribution is discussed through three overarching mechanisms: (1) avoiding low-value care, (2) altering the benefit–risk balance of justified services, and (3) increasing accessibility and efficiency. Finally, RTTs cross-cutting contributions are discussed.

The following discussion is structured accordingly.

Discussion

Avoiding low-value care

Radiation therapists are uniquely placed as frontline professionals to engage with patients (14, 15). They are the ones who actually meet the patient at the time of treatment, and are therefore in an exclusive position to identify changes in clinical status and patient wellbeing (16). Such changes can be identified through patient assessment. In a value-based healthcare system it is most common to take the patient perspective while at the same time it is the healthcare professionals who interpret what is of value to the patient (17). Still, it is a tendency to focus on biomedical endpoints for assessing value. RTTs should, however, approach and interact with patients holistically (18). For example, as there is growing evidence that cancer treatment is overused in terminal palliative care, and the optimal level of radiation therapy is undefined (19), an holistic approach might identify patients that may not benefit from radiotherapy, due to deterioration in clinical status, treatment tolerance, or patient preferences. In such situations, RTTs may contribute by raising concerns within the multidisciplinary team, thereby supporting decisions to modify or discontinue treatment. This “gatekeeping” role represents an important contribution to personal value, as it helps ensure that treatment aligns with patient goals (6). However, this role is not without challenges. Decisions to withhold or discontinue treatment remain complex and ultimately rest with the physician. RTTs’ contributions may therefore depend on organisational culture, communication pathways, and clearly defined professional roles. Additionally, there is a risk that variability in RTT experience and training may influence assessments of clinical appropriateness.

Altering the benefit-risk balance

A second major source of low-value care is services that are justified but delivered with suboptimal quality. RTTs contribute to improving the benefit–risk balance by enhancing both treatment effectiveness and safety.

One driver for low-value services, is the use of technology just because it is available, not because it is necessary or adds value to the service (20). Efforts to enhance benefits might therefore include optimizing the use of already existing technologies. This includes participation in protocol development, quality assurance, and interdisciplinary discussions. For example, the use of advanced imaging systems yield the possibility for daily 3D-imaging for treatment verification and adaptive radiotherapy (ART). The increasing use of IGRT and

ART makes RTTs essential in evaluating how these technologies should be used. RTTs must therefore discuss the level of technology used, for example what are the pros and cons for 2D vs 3D imaging at the linac for specific patient groups, imaging frequencies and actions based on imaging findings. Bujis and colleagues (21) describes how RTTs, together with radiation oncologists and physicists, developed take action protocols to act on anatomical changes seen on CBCT. Consequently, the protocol provided a better balance between workload and efficiency in relation to appropriate response to anatomical changes identified at the treatment unit.

Another way of enhancing benefits include patient-centred initiatives such as tailored follow-up. Najeem and colleagues (22) implemented a follow-up regime by telephone, led by RTTs. The study concluded that the regime was beneficial to identify patients in need for additional care post-radiation treatment. However, RTTs contribution to such tasks are rarely explicitly defined (23). Due to inconsistencies in education and training, RTTs might lack advanced communication skills and understanding of patient psychology. This can be achieved through continuing professional development (24) and survivorship specific training (23). Such initiatives may improve personal value by addressing patient needs beyond technical treatment delivery.

RTTs play also a crucial role in reducing risks. This includes ensuring accurate treatment delivery and identifying anatomical variations during IGRT (25), and participating in incident reporting. Incident reporting systems are designed to capture unsafe conditions, near misses, risks, and incidents, and to learn from such events (26). Consequently, RTTs should report incidence and near misses and contribute actively to learn from mistakes and to change practice accordingly. These activities are central to technical value, as they directly influence treatment quality and patient safety.

Increase accessibility

A third category related to low-value care is inefficiencies in service delivery, including delays, underuse of effective treatments, or suboptimal utilisation of resources. Consequently, technical value is related to system efficiency, ensuring that the allocated resources are used in an optimal way (6). RTTs contribute to addressing these challenges through workflow optimisation, implementation of new technologies and improving the use of existing technologies.

New technologies might improve value (16) by replacing repetitive and time-consuming task (15). Moreover, new technologies such as advanced imaging guiding and surface guiding systems might change the workflow in which radiotherapy treatments are delivered (27). Accordingly, RTTs can increase the value of radiotherapy services by contributing to optimizing the workflow within their department. Optimization efforts might lead to increased productivity, thus freeing time for more patients to be treated. For example, the use of artificial intelligence and scripting might improve the treatment planning process and could be a major contribution to the efficacy of radiotherapy departments. However,

automated processes need human oversight, expertise and critical decision-making (28). RTTs are ideally positioned to lead implementation and to use technologies safely (15) and RTTs should therefore take a leading part in this work. Moreover, the implementation of new technologies or changes in workflows must be evaluated so that increased productivity does not compromise quality and safety. RTTs should therefore not only take part in the implementation of technologies but most importantly, ensure that innovations are evaluated and reassessed. The latter is vital for increasing the value of radiation therapy services.

Cross-cutting contributions: research, innovation, and system-level impact.

Across all three domains, RTTs might contribute to value through engagement in research, innovation, and quality improvement initiatives. Generating and implementing evidence is essential for reducing low-value care and promoting effective practices.

While RTTs are well placed to participate in such activities, existing literature indicates that research engagement remains limited (29). As one precondition for working evidence-based is that available evidence exists, RTTs must conduct research within their own field. RTTs should therefore contribute to the production of evidence by initiating and participating in research together with the multidisciplinary team. RTTs must play a role in research and ensure that treatments are planned and delivered in line with updated evidence and patient preferences.

Many drivers of low-value care lie beyond individual professional practice, including financial incentives, organisational structures, and cultural factors. As such, RTT contributions must be understood within a wider system context. Achieving value-based radiotherapy requires not only individual efforts but also supportive institutional frameworks. Strengthening research capacity among RTTs could therefore enhance their contribution to value-based radiotherapy.

Critical reflections

This paper addresses how RTTs might contribute to value-based radiotherapy. However, there are several limitations to such generalization. For instance, there is no harmonization of radiotherapy education across the European Union (30). The education level and roles of radiation therapists varies (31), and lack of regulations and specific training might lead to underdeveloped competencies (32). Moreover, underdeveloped competencies might compromise patient care (32). Accordingly, education of RTTs should be more harmonized.

Moreover, there are many drivers for low-value care. Verker and colleagues (20) identified series of system factors, knowledge factors, and social factors that yielded low-value services. Key factors for low-value care utilization are the payment system, the pharmaceutical and medical device industry, fear of malpractice litigation, biased evidence and knowledge, medical education, and a “more is better” culture (20). Hence, there is a need to change both the system and the culture towards a value-based approach. In an

optimal value-based setting, participation of RTTs in improving the services will be both natural and prioritized.

This discussion paper is based on a selection of literature. Literature might exist that could support other viewpoints. Hence, there is a need for a more systematic literature review on the topic. Further research should focus on RTTs role, and facilitators and barriers for enhancing value of radiotherapy in the context of value-based healthcare.

Conclusion

RTTs are in a unique position to increase the value of radiotherapy services. However, many barriers exist. There is a need for a value-based culture. Accordingly, leaders of radiotherapy departments must acknowledge RTTs capacities to increase value of the services. This paper provides examples where RTTs are key stakeholders for such efforts. Hence, RTTs should be a natural part in increasing the value of radiotherapy services and bringing radiotherapy forward.

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