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Review Article

Modern Workforce in Academic Radiation Oncology: Challenges and Opportunities

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Abstract

Cancer care for the modern patient has become increasingly complex with the competing need to deliver care in closer approximation to the home of the patient. This raises challenges for the modern department of radiation oncology in balancing geographically determined cancer care with academic growth. Career development had uniformly been symbiotic with practice locations at central academic medical centers. The modern workforce needs to adapt and achieve academic growth in centers aligned with health care networks. This manuscript addresses many of the challenges posed by this dichotomy and offers potential problem-solving strategies and solutions to ensure academic success.

Keywords: Academic radiation oncology practice; Career development; Cancer care

Abbreviations

FTE: Full Time Employee(s); NCTN: National Cancer Institute's National Clinical trials Network; NIH: National Institutes of Health; RVU: Relative Value Units

Introduction

The practice of radiation oncology has undergone significant change over the past thirty years. Today, over 60% of cancer patients receive curative/palliative radiation therapy as a component of their disease management. More than 75% of these patients receive radiation therapy with intent to cure, an increase from 50%, thirty years ago [1]. This has significantly changed the modern practice of radiation oncology. Clinical decision strategies are now inherently more complex with influence from patient-specific medical comorbidities, tumor-related information, and image-based information of normal tissue function. These factors define the extent of normal tissue sparing and need for complex volumetric treatment planning. This has promoted, in part, subspecialty practice with multidisciplinary partners including radiation oncology. The time and effort associated with team-patient management should be acknowledged as part of team-oriented metrics for measuring clinical productivity and professional academic growth of each faculty member. The technology of radiation therapy has become exceptionally complex and patient expectations for both outstanding clinical service and clinical outcome have never been higher as measured by patient satisfaction surveys. Modern oncology patient care has become a concierge clinical practice. Because we interact with patients and almost all medical/surgical service subspecialties on a near daily basis, often radiation oncologists are called upon to bridge gaps in service between multiple health care providers, patients, and families. Radiation therapy treatment planning is volumetric and image driven with treatment execution uniquely image guided, making radiation oncology dependent on many imaging tools. As radiation oncology technology has evolved, the skill set of the modern radiation oncologist has had to adapt at multiple levels including acquiring personal real-time expertise in specific work-related information previously reserved for colleagues in other medical, surgical, and radiology practices. Radiation oncologists now often bridge information between surgical and medical colleagues to reconcile issues in daily patient care. To be an effective member of the oncology multidisciplinary team, the radiation oncologist must be fluent in the strengths and limitations of surgical and medical team members as well as understand how advanced technology imaging tools and other evolving biomarkers will affect modern practice. Although radiation oncology functions as a department, individual faculty are now woven into a matrix of patient-centered multidisciplinary partners. An important aspect of modern practice is to learn how to function in a team-oriented patient care approach when team members may not fully appreciate the strengths and training limitations of the radiation oncologist. As a result, radiation oncology department leaders need to understand the challenges imbedded within the workforce and apply guidelines for department function to 1) ensure patient care needs are met 2) the intradepartmental workforce and workflow needs are met and 3) productivity expectations are balanced with individual faculty academic growth and career development.

In this manuscript we examine challenges facing today's physician workforce in radiation oncology and strategies for balancing the competing needs for administrative productivity and requirements for academic career development and personal growth.

Problems, Pitfalls, and Opportunity for Modern Radiation Oncology

Unlike many surgical and medical oncology disciplines, radiation oncology departments often extend to multiple campuses in geographically diverse locations with an embedded expectation for uniform treatment execution. Owners and partners in geographically

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diverse locations may be different within a single global health care system; therefore, network treatment facilities may have varied and diverse administrative interests. The technology of radiation oncology is rapidly changing and informatics tools permit interactions to take place between radiation oncologists and physics planning teams within a network. Modern informatics permits patient-specific case management and treatment planning to be developed across multiple geographic locations with several practitioners at a single time point. Collaborations between faculty can synergistically mature through this mechanism as treatment planning expertise and problem solving between practitioners can be shared between campuses. Accordingly, more uniform department planning and treatment standards can be established, maintained, and adjusted when appropriate with constant review of data and patient outcome information. This permits uniform intradepartmental process improvements to coincide and align with department productivity. These processes will enhance department problem solving and, when applied in a systematic manner, will enhance department academic objectives.

There are times, however, when uniform informatics processes cannot establish nor be the sole function insuring common ground between faculty which is needed for uniform patient execution. Many experienced radiation oncologists were trained in an era that did not include volumetric treatment planning and image guidance. This creates the potential for intradepartmental conflict as the recently trained radiation oncologists are exclusively trained using these tools. Newly trained faculty may/may not possess mature clinical acumen to apply these tools in each situation. Department leadership needs to bridge this gap with frequent chart rounds and sessions dedicated to modern treatment planning including strategies for drawing tumor targets and normal tissue. From these sessions, department standards can be established for more uniform patient care.

There are many tools, including integration of informatics, which can be used to facilitate the development of departmental process improvements. In the ideal circumstance, the department should function on a single platform for rapid sharing of information. To offer centralized treatment planning and uniform department treatment execution, optimal teletherapy equipment needs to be synergistic between campuses, often best accomplished through a single vendor. This provides for compatible planning strategies and uniform treatment execution. Pre- and on treatment chart rounds performed through informatics tools help all department members review imaging and radiation therapy objects in real time and share planning information and decision strategy. It is challenging to replicate each radiation service at all satellite facilities, however modern equipment with a single vendor for intensity modulation, image guidance, motion management, and radiosurgery/stereotactic body radiosurgery helps to promote clinical and academic activity between department members and promotes department efficiency. Modern accelerator technology houses most imaging and treatment execution strategies within a single unit thus decreasing the need for eclectic single purpose equipment. Modern accelerator technology coupled with consistent treatment planning standards can facilitate the development of standards across all treatment campuses. Modern problem-solving issues including target contouring strategies, image guidance, and motion management can be studied in a uniform format and presented in multiple venues coupled with patient specific outcome data for review by both institutional committees and colleagues. This would also include evaluating tumor control and normal tissue outcomes using volumetric radiation therapy planning data coupled with patient baseline functional status and outcome. Developing modern practice standards with metrics for ongoing analysis is readily accepted for publication in many radiation oncology journals. Validating metrics with other institutions with similar technology further promotes academic growth including metrics associated with quality of life and cost between institutions. Therefore, promoting process improvements in the workplace as an academic exercise can enhance patient care and promote academic growth in a synergistic manner. Using metrics that include other department divisions (nursing, therapy, physics, etc) as well as vetting ideas with other university departments/divisions will promote good multidisciplinary interactions. This would permit participation in projects by all facilities within a health care network and serve to have investigators not housed at the central location to be recognized for their contributions. Every patient treated with radiation therapy can be part of a clinical investigation whether the study has modest or comprehensive target endpoints.

Many of the most difficult workplace challenges arise in the identification of work scope between the central university-based campus and satellite staff. Often, disease-based clinical and academic activity tends to be housed at central/university campuses. This is due in part to the fact that surgical and disease-specific subspecialty practices are often centrally located and tumor board and multidisciplinary discussions take place without involvement of satellite Full Time Employees (FTE). There is an inherent perception among department faculty that this activity favors academic growth and that work at satellite facilities does not promote academic growth or career development. Tumor boards are vehicles for oncology providers to meet and share information on patient care. Imaging and pathology objects can be reviewed by all parties at the same time and reach closure on a treatment strategy. This insures that all providers are in alignment with the plan and communication to the patient and family is consistent and uniform. In central disease-based clinics, tumor boards are disease-specific and the providers are more focused disease-oriented issues including subspecialty-based medical and surgical practices. The practitioners involved in the disease based clinic may or may not be familiar with practitioners at the satellite facility. If they are not familiar with off-site practitioners and the communication is incomplete, distance can develop between the central clinic and the site where patient care will be delivered. When patients are referred to a disease-based clinic for evaluation, they are referred to a clinical operation. When patients are sent to a satellite facility, they are often referred to a specific person. Bridging this gap is essential for harmonization within a radiation oncology department. Informatics tools can help bridge this gap in both directions. At present, our satellite practitioners can participate in disease-specific tumor boards via WebEx and arrangements are made for off-site coverage to enable in person attendance at disease based clinics as needed. This permits patient information to be shared appropriately between disease-based clinics and off-site practitioners as well as maintain relationships between disease-specific clinical staff and all practitioners. Tumor boards at satellite facilities often are more general in scope and not disease-specific. Nevertheless, these tumor boards have a very important function

promoting outstanding modern patient care in the community. A disease-based expert can, in turn, either attend or remotely log into a community tumor board. Historically, tumor boards required in person attendance to review objects and participate in the dialogue. This had the advantage of face to face interaction between providers and remains for many practitioners the optimal manner for interactions. However, adjustments need to be made in tumor boards, chart rounds, and faculty meetings to accommodate the needs of the off-site practitioner. Practice management, including federal/state regulations in radiation oncology; require that physicians be present on-site from the beginning of the treatment day until the final patient has completed treatment. This complicates travel for off-site practitioners. Nevertheless, adjustments need to be made in the manner that we conduct these meetings for all practitioners to be and, more importantly, feel included and part of the clinical and academic programs. This requires time and effort as well as an investment in optimal tools for system informatics integration.

Another challenge for developing productivity metrics is recognizing that the use of Relative Value Units (RVU) may not always reflect the work and productivity of radiation oncology. RVU captures elements of physician work, practice expense, and malpractice liability expenses with a conversion factor into a specific dollar value. The conversion factor is periodically updated according to a formula determined by statute. The use of RVU initiates a conversation for productivity; however, may be biased to treatments which have a higher reimbursement for procedures thus provide a false perspective on physician productivity. Oncology is a difficult area to fully analyze by this process. A physician can spend an hour with a patient and family discussing that there is no longer active therapy for the patient. This will not generate a RVU, nevertheless is important and highly productive use of physician time that can not be acknowledged through this mechanism. Many radiation oncology codes including treatment execution have no physician work component further complicating the evaluation of productivity. Placing a cost value on each time element of physician care can lead to both over treatment and decreased physician time with patients and families with guarded outcome. Productivity needs to reflect all elements of the mission, not just the mission of profit. It is recognized that we need to meet budget and this is under constant revision and evaluation. Within the overarching budget, the leader needs to create a strategy that keeps physicians moving forward in their careers and concurrently meet the needs and expectation of administration.

Optimal Department Structure and Compensation Strategy for Clinical and Academic Success

There are many factors which are changing the practice strategy for radiation oncology. More practices are becoming part of integrated health care networks which include comprehensive cancer centers and strong community-based practices. More oncology reimbursement is being negotiated as an integrated cost, making it important for radiation oncologists to be visible and function through matrix organizations. Accordingly, more radiation oncologists function as a group in the academic and community settings. This becomes increasingly complex as society places emphasis in distributing advanced technology radiation therapy into community-based practices. The challenge remains in creating a department structure with geographically dispersed faculty. There are services which require centralization of care. Pediatrics and brachytherapy services are not uniformly distributed throughout radiation therapy practices and often are centralized in department structure to insure quality assurance and optimal care. These services create asymmetry in RVU distribution as often the time required to provide outstanding service is not recognized by fiscal metrics. The asymmetry needs to be recognized by the department leader and the leader must advocate to administration in order to build a comprehensive productivity strategy for the department as an integrated network.

Faculties have diverse interests and strengths. Modern departments require multiple disease-based areas of expertise, therefore diversity of interest is important in creating a strong modern department. In creating a modern comprehensive compensation strategy, there are many competing requirements which need to be addressed to meet the needs of all faculty members as well as address administrative expectations for department profitability. The compensation portfolio requires a base allocation driven in part by academic rank and years of service as well as a yearly allocation rewarding activity during the previous year. The reward system needs to recognize the tripartite mission of patient care, education, and research. Specific faculty members will place emphasis on various areas of the mission including education and clinical/translational and basic science. Diversity of interests among the faculty members will serve to strengthen the department clinical and academic portfolio and add strength to the cancer program. This can also include development of tumor boards and multidisciplinary clinics for common cancers in satellite facilities integrated with the primary campus.

Much of compensation in radiation oncology is driven by clinical revenue, therefore for clinically based faculty compensation strategies will be driven in part by clinical volume. Clinical volume and revenue in radiation oncology are driven almost exclusively by new patients to the department. Although there are established patients on treatment for definitive and palliative care, the department's financial health is driven by new patient volume, similar in scope to surgical specialties. Therefore, for department compensation in our department at the University of Massachusetts Medical School, each full time faculty member (1.0 FTE) will see 200 new patients/year for their base salary allocation. For faculty that does not work full time, the new patient figure is adjusted to their specific FTE status. For example, a 0.6 FTE will have the base number of 120 new patients/year.

Faculties have diverse interests and bonus/at risk compensation needs to reflect the tripartite mission. In our department, each faculty member receives 50 points for meeting base allocation and needs to achieve 100 points to receive bonus/at risk compensation. This can be accomplished through multiple pathways based on faculty interest independent of practice location. For every new patient a faculty member evaluates, they receive an additional point. Therefore, if a faculty member is exclusively focused on patient care, they receive bonus/at risk compensation if they see 250 new patients/year. Faculty receives 1 point for every hour for formal teaching medical/allied health student, residents, and fellows. Therefore, fifty hours of formal teaching in addition to seeing 200 new patients/year would make the faculty member eligible for bonus/at risk compensation. This includes

formal prepared teaching/lectures at tumor conferences when appropriate. Faculty receives 5 points for every abstract submitted to a society meeting and 10 points for every paper submitted for consideration for publication. An additional 10 points is awarded if the paper is accepted for publication. Faculty receives 50 points for every grant submitted in a National Institutes of Health (NIH) format. For each patient entered on a National Cancer Institute's National Clinical trials Network (NCTN) or in-house clinical trial, the faculty member receives 1 point. During an approved leave of absence, the department will exclude the disability time as a percent FTE effort as the faculty member is held harmless from lost productivity during this time. At the discretion of the department chair, a faculty member may be awarded additional bonus/at risk incentive in recognition of performance during the year that may not be fully recognized by the current incentive structure. Examples of this may include leadership recognition and public service. Faculty have the responsibility to see patients and cover the practice from the beginning of the treatment day until the final patient is treated. In diverse geographies, patient populations may vary in different department locations. The incentive structure allows the department chair to make sure certain incentives are balanced and everyone is rewarded for work performed in various work environments including research and basic science interests.

Summary

The work environment in radiation oncology has undergone significant change over the past decade. There are fewer individual practices as radiation equipment and treatment planning become more complex. Most professional practices are now part of groups that can be housed in several environments. Historically groups worked in a single environment and patients were expected to travel for centralized cancer care. The environment has changed as society has requested that advanced-technology radiation therapy be available in the community combined with community-oriented medical oncology. Radiation oncology becomes integrated with the community environment and brings academic focus to the community environment. Balance is needed and will serve to upgrade and enhance community practice as the radiation oncologist becomes more involved in medical education and participation in medical staff affairs. This change in perspective requires a transition in work scope within the workplace environment. The technology of radiation oncology lends itself well to integrated group care in multiple geographies; however, this alone does not insure that the radiation oncologist on site necessarily feels part of a group matrix or group practice environment. The environment for cancer care is undergoing change and we are witnessing the evolution of service line based care. We have transitioned into a navigator-centered disease-specific referral and evaluation system housed within multidisciplinary clinics for common cancers. This has enhanced broader discussion among colleagues and has the secondary benefit of visually defining strengths and limitations of each service. Good programs become very good when all parties can harmonize and develop efficient work habits for patient care. Very good programs become excellent when each service reviews outcomes and makes adjustment in work scope and workflow based on review of internal information. Excellent programs become outstanding when outcome evaluations become part of an integrated effort for clinical translational science.

Several papers have been written a prominent group of radiation oncologists reviewing their collective findings on the future of the radiation oncology workforce in the United States. There is a predicted undersupply of physicians needed to address radiation therapy patient care needs of the future. However, this assumption was based on a platform of 140 training positions available each year. Training slots have now increased to 200 per year. While this does not currently predict for an oversupply of radiation oncologists, the information suggests that those entering the workforce may have fewer choices in terms of practice environment and location than in the past. It is incumbent on department leadership to make certain the specific site location has the correct environment for personal and academic growth [2-9].

Leaders and senior members of groups should commit and develop strategies to promote group dynamics and support clinical and academic growth for all on-site and distributed faculty. This is not a simple task yet an important step forward for our changing discipline. Health care has changed and radiation oncology and our faculty will continue to work and adapt to the changing environment.

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