ASTRO news
SPRING 2022

THE CHANGING ECONOMICS OF RADIATION ONCOLOGY

The Transformative Effects of Digital Health

The impact of digital health and how it's shaping economic discussions within health care.

Page 8

The Changing Practice of Radiation Oncology

Current trends in radiation oncology treatment delivery and the impact on practice economics.

Page 11

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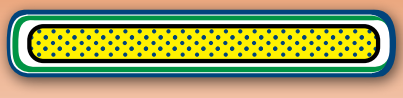

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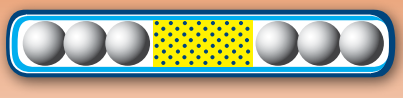

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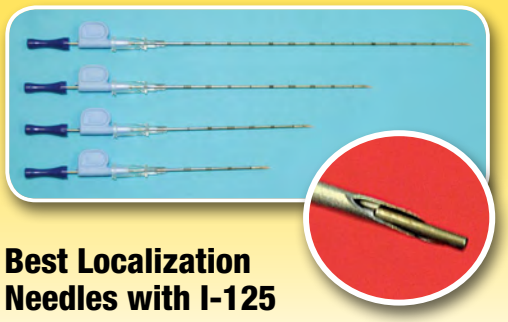

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In This Issue

Features

Society News

Departments

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ASTRO news

AMERICAN SOCIETY FOR RADIATION ONCOLOGY

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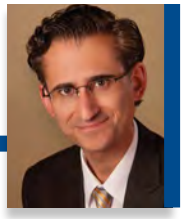
EDITOR'S*notes*

BY NAJEEB MOHIDEEN, MD, FASTRO
SENIOR EDITOR, *ASTRONEWS*

HOW CAN WE LAY THE FOUNDATION for a stable and sustainable future without compromising on innovation and research? Radiation oncology is a small but capital-intensive specialty that's been in the crosshairs of payers for over a decade. Speculation on the economic future of our field has generated intense — often confrontational — debates, both in print and on social media. Adding to that is the uncertainty over digital transformation and AI, changing fractionation schemes in common disease sites, alternate payment models, ad infinitum. The economic focus of this issue is therefore timely and will hopefully stimulate constructive dialogue on the matter. And, toward that end, I am delighted to welcome Connie Mantz, Chair of ASTRO's Health Policy Council as Guest Editor for his wisdom and perspective on this complex issue. I look forward to your thoughts and ideas.

GUEST EDITOR
Constantine Mantz, MD, FASTRO



Among U.S.-based readers of this edition of *ASTROnews*, there is a growing sense that the ground upon which we have built our practices is shifting beneath our feet. Historically, incremental reimbursement under fee-for-service had enabled the development of technical innovations and the subsequent conduct of clinical research that improved patient outcomes. Dose escalation, IMRT, IGRT and SBRT are immediate examples of such innovations. At present, however, we have passed an inflection point beyond which our legacy payment system no longer aligns with best practices for the high-volume conditions we treat. Hypofractionation, despite a large body of mature evidence, is discouraged under fee-for-service for risk of significantly reduced payments. Furthermore, our Medicare fee schedules are subject to statutory requirements of budget neutrality, meaning that the federal government allocates a fixed pool of dollars (after annual adjustments for the number of enrollees, inflation and other factors) to the Centers of Medicare and Medicaid Services (CMS) to pay for its beneficiaries' health care. Under budget neutrality and through a recent set of payment policy changes, CMS has effectively shifted billions of dollars away from specialist procedural services to fund higher reimbursements for primary care services. Radiation oncology has been disproportionately impacted by these changes insofar as global radiation therapy revenues skew heavily toward payments for its procedures. The projected result of these internal and external forces is continued downward pressure on our professional and technical reimbursements for the foreseeable future.

Anticipating these impacts under fee-for-service, ASTRO exercised strategic foresight in 2014 and organized a payment reform workgroup that began to engage with CMS on the development of an alternative payment model for radiation oncology. ASTRO ultimately proposed a model that would uncouple reimbursement from service volume by issuing a single payment for all services over a 90-day period. Episode payments would vary by cancer type and would be determined on a weighted-average basis according to the relative frequencies of all paid services in Medicare's claims database for each cancer type. Finally, the proposed model would hold episode payments stable for five years with subsequent rebasing of payment rates to be determined by changes in service utilization observed in the interim and would also allow fee-for-service reimbursement for new services pending accrual of outcomes data. In total, we believed that such a model would encourage high-value care, allow for a separate revenue stream to nurture innovation and achieve payment stability to support ongoing capital and staffing improvements for our practices.

CMS' RO Model, which was scheduled to launch this January but has since been delayed by congressional action to start January 2023, has adopted many of our proposed model's features but has also included steep discount factors applied to episode payments to

Continued on following page

achieve targeted savings for the Medicare program and trend factors to adjust episode payments annually with payment trends under fee-for-service. According to our impact modeling, these additional features would assure payment cuts relative to prevailing fee-for-service for 70-80% of RO Model participants in addition to ongoing payment instability for all participants. While the RO Model remains delayed, we remain committed to our original goals of payment reform and will continue to work with CMS and others toward achieving fair and stable reimbursement.

In this issue, we are pleased to provide contributing pieces from health policy opinion leaders detailing the inadequacies of fee-for-service pertinent to radiation oncology and the potential opportunities of a well-designed alternative payment model. Dr. Ezequiel Silva details the limitations of Medicare's outdated practice expense methodology — the cost-accounting method used to determine the valuation of our services — in allocating the costs of digital health software in use today and artificial intelligence tools on the horizon so that these increasingly meaningful expenses are appropriately captured in our payments. Along similar lines, Gerald White describes the insufficiency of procedure codes in accounting for the range of technical work performed by the medical physicist in the preparation and performance of modern radiation therapy. Pieces from Drs. Cathryn Yashar and Amar Rewari and Anne Hubbard and from Drs. Aaron Bush, Robert Miller and Mark Waddle each put forward cogent arguments against the RO Model, particularly its punishing effects on those practices already engaged in high-value care and its risks to a practice's ability to fund innovative and necessary improvements to its service lines. Drs. Stephen Abel, Jenna Kahn and Sushil Beriwal identify a 5-15% underutilization of radiation therapy services for eligible patients and describe patient- and physician-related barriers, among which we may reasonably conjecture that unrealized hypofractionation under fee-for-service must be a contributor. Drs. Gustavo Nadar Marta and Philip Poortmans cast needed light on the opportunity of promoting evidence-based care through payment structure from an international perspective by correlating fee-for-service and bundled payments with hypofractionation utilization across 13 national health systems. Drs. Paul Wallner and Arve Gillette provide a valuable historical context on the evolution of radiation oncology practice models, and Drs. Luca Valle, Ann Raldow and Michael Steinberg draw our focus to the ostensible purpose of a publicly funded health care system: to facilitate the delivery of value-driven, patient-centered care while enabling technical and process innovations to advance the field forward.

> "...there is a growing sense that the ground upon which we have built our practices is shifting beneath our feet."

Radiation oncology, if it should continue to foster and disseminate the kind of breakthrough technologies it has done so successfully over the past 30 years, must consider alternatives to current iterations of fee-for-service and the RO Model. Our field is necessarily a high fixed capital expense medical specialty, and our cost structures cannot adapt to continued diversion of Medicare funds under fee-for-service. We do not oppose Medicare's initiative to provide greater funding for primary care; however, we may object to the application of budget neutrality in the allocation of those funds in that doing so renders meaningless preceding efforts to cost services and determine reimbursement. For a radiation oncology practice, the experience under fee-for-service has been arbitrary payment declines long after commitments to expensive equipment and software have been executed under very different financial assumptions. The RO Model exacerbates the problems of fee-for-service through discounting and other negative adjustments that further restrict needed cash flow to sustain our current operations and provide for future improvements.

Looking forward, a payment method dedicated to radiation oncology and its unique operating model that harmonizes aggregated provider payments around a mean of observed utilization and secures those payments against the erratic effects of other fee schedules would promote the diffusion of evidence-supported best practices much as fee-for-service has promoted technical advances. At the same time, fee-for-service may be reserved as a mechanism to price and pay for new services while data accumulate to inform later decisions for inclusion in a bundled payment. Meaningful process and outcomes measures with minimal reporting burden would also be a highly desired feature of such an alternative payment model.

ASTRO will continue to engage with CMS, Congress and other stakeholders during this critical time of transition to achieve fair and stable payments for our services and, ultimately, for the benefit of our patients.

CHAIR'S*update*

BY LAURA A. DAWSON, MD, FASTRO, CHAIR, BOARD OF DIRECTORS

Updates from ASTRO BOD Strategic Planning

BEFORE MY SECOND CHAIR'S UPDATE, I want to express my support for Ukraine following the unprovoked war, leading to horrific humanitarian consequences within days. As I react with sadness and anger, I am reminded to be grateful for my own freedom, family and friends. I am also thankful to be working with so many passionate ASTRO volunteers and staff who have the shared vision to improve the lives of cancer patients.

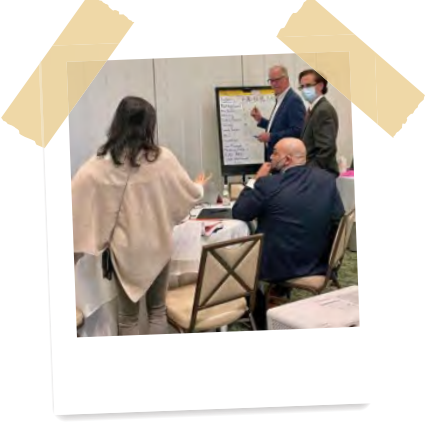
In January, the ASTRO Board of Directors set aside a day and a half to participate in a strategic planning work session. The goal of the session was to review and build on key issues and priorities for the Society and to take a fresh look at the strategic plan. The session was riveting and enjoyable, with most of the Board members participating in person and a virtual breakout room for those who could not travel to the meeting. The hybrid format worked well, and I anticipate that such a format will continue well past the end of the pandemic. In preparation for the session, feedback was obtained from an environmental scan of key stakeholders, interviews with Board of Director members, and a survey of ASTRO committee members.

Two themes that came from the strategic planning session were a need for increased transparency and targeted communication. To that end, an infographic was recently created outlining the steps to volunteer for an ASTRO committee, which is the first stage to getting involved with the Society, potentially leading to becoming a committee vice-chair and chair and an ASTRO Board member. We plan to develop more infographics to highlight other processes that may not be well understood. Increased communication between ASTRO and ASTRO members, all radiation oncologists, all physicians, medical students and other societies, as well as the public, about our resources is our ultimate goal. Effectively and succinctly sharing information is always a challenge, especially in the era of information overload. ASTRO staff and the Board will continue to look at opportunities for increased and enhanced communication.

Strategic goals that came from the strategic planning session included, in no particular order:

- Cultivating fuller engagement with the radiation oncology community, specifically those early in their career.
- Fostering a diverse workforce and improving access to equitable care.
- Driving high quality care.
- Ensuring access to innovative education.
- Showcasing the patient benefits of radiation therapy.
- Enhancing research funding and innovation in radiation oncology.
- Leading policy advocacy.

The Board of Directors were requested to rank these goals (results are pending at the time of writing this update). After ranking, ASTRO staff, in conjunction with the Board of Directors, will work on the tactics and strategies for the priority goals. Please reach out to the Board if you have feedback or other ideas for the ASTRO Board to consider during this process. Since my last Chair's report, ASTRO hired a third party firm, Health Management Associates Inc., to better understand the radiation oncology workforce and



In January 2022, the ASTRO Board of Directors participated in a strategic planning work session, reviewing, building on and prioritizing key issues for the Society. Pictured above, Board members work in small breakout groups to identify key drivers of success and strategic initiatives for the Society, all of which will be used to develop an updated Strategic Plan.

Continued on page 27

Improving Quality, Improving Lives

One of ASTRO's core goals is to ensure that our members consistently deliver the highest quality and highest value care to people with cancer. Much has been done to improve quality and to shine a light on these efforts, a new feature, "Improving Quality, Improving Lives" will be a regular update in *ASTROnews* starting with this edition.

IN JANUARY 2022, ASTRO launched the ASTRO QI Newsletter. This newsletter shares resources, practical applications and educational offerings with leaders in quality and safety and is an exclusive benefit to participants of ASTRO's APEx – Accreditation Program for Excellence® and RO-ILS: Radiation Oncology Incident Learning System®.

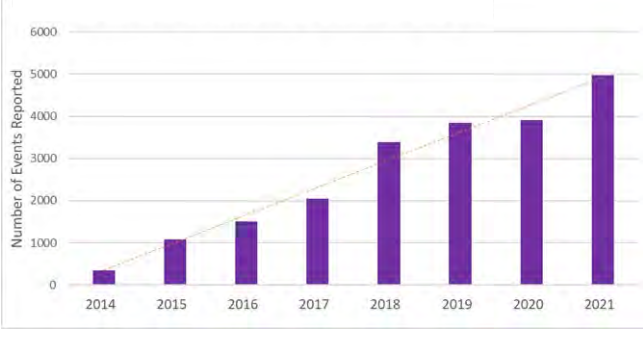
The inaugural ASTRO QI Newsletter provided radiation oncology practices with:

- Free access to a safety session from the ASTRO 2021 Annual Meeting
- Sample documents and resources for use in their facilities
- Practice spotlight highlighting their QI-focused efforts
- Recent safety- and quality-focused publications
- A bulletin of upcoming quality events
- And more….

Two ways radiation oncology practices can demonstrate their commitment to quality and safety is by participating in RO-ILS and APEx. Both ASTRO programs continue to grow as more practices see these initiatives as meaningful ways to improve quality in their clinics.

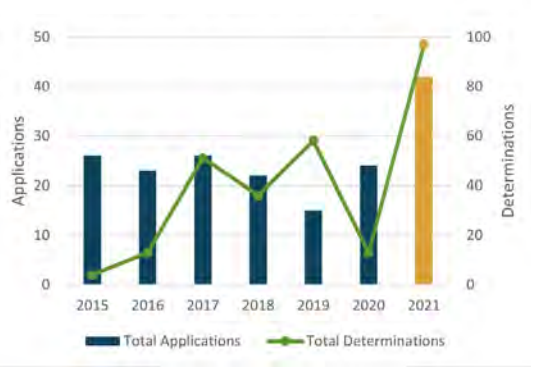
Since RO-ILS began in 2014, more than 21,000 cumulative safety events of varying severity were reported to Clarity PSO. Data contributions continue to grow and have rebounded after COVID took priority in 2020 (Figure 1). This is encouraging as a large number of events is a positive indicator of safety culture, vigilance and learning opportunities. 650 facilities are enrolled in RO-ILS, representing approximately 27% of all U.S. facilities.

Figure 1: RO-ILS reporting continues to increase



APEx, the fastest growing radiation oncology accreditation program, is now recognized in all 50 states. In 2021, APEx saw the highest growth since the program started. There was an 86% increase in applications and ASTRO issued 234% more determinations than the program's historic rolling average (Figure 2). In a recent APEx evaluation survey, 97% of practice staff said they were likely or very likely to recommended APEx to a colleague. APEx provides an external review of the practice's processes and procedures and verifies that the entire radiation oncology team is operating at the highest level.

Figure 2: APEx sees exponential growth in 2021



To learn more about APEx Accreditation, review the article "Why Pursue Accreditation" from the Spring 2020 *ASTROnews* and the Accreditation Program for Excellence (APEx): A Catalyst for Quality Improvement paper in *Practical Radiation Oncology*.

Join APEx and RO-ILS now to receive program-specific benefits to your practice, including the exclusive resources in the QI Newsletter.

ASTRO Board approves independent assessment of U.S. radiation oncologist workforce

ASTRO IS PLEASED TO ANNOUNCE that it has retained the services of Health Management Associates to conduct a thorough analysis of the expected workforce needs in radiation oncology over the next decade. The Workforce Task Force Chair Bruce Haffty, MD, FASTRO, and co-chairs Chirag Shah, MD, and Pranshu Mohindra, MD, recently discussed this process and provided further context around the radiation oncology workforce in an ASTRO Blog. Read the post at www.astro.org/Blog.

Additionally, ASTRO released the following statement on issues impacting residency training programs.

Statement on the U.S. Radiation Oncology Workforce (February 2022)

ASTRO continues to support the critical role of high-quality residency training to optimally educate and prepare our future workforce. It is a foundational principle that residency training positions should be filled by qualified candidates who are enthusiastic about the field. To that end, we encourage stakeholders to carefully consider the following factors as they evaluate the size, selection process and scope of their training programs:

1. *The quality and extent of each candidate's interest in radiation oncology.*
2. *How the specialty, as a whole, as well as individual programs, can engage, recruit and retain diverse applicants.*
3. *Availability of sufficient resources for clinical operations so that the priority for residents is education.*
4. *The future expected need for radiation oncologists.*
5. *Whether participation in the SOAP is warranted and in the best long-term interest of providing quality training, innovation and patient care.*

The ASTRO Board is committed to maintaining distance from the analysis to ensure that there are no perceptions of any internal influence. It is the intention of the ASTRO Workforce Task Force to regularly update ASTRO members about the progress of the study while maintaining the boundaries required to ensure that the analysis and recommendations remain the independent domain of the outside firm.

In Memoriam

ASTRO has learned that the following members have passed away.

Our thoughts go out to their family and friends.

❖

John Horns, MD,
Los Angeles, California

Robert H. Sagerman, MD, FASTRO,
Fayetteville, New York

Hobart W. Shackford, MS,
Providence, Rhode Island

George W. Sherouse, PhD, FAAPM,
Durham, North Carolina

❖

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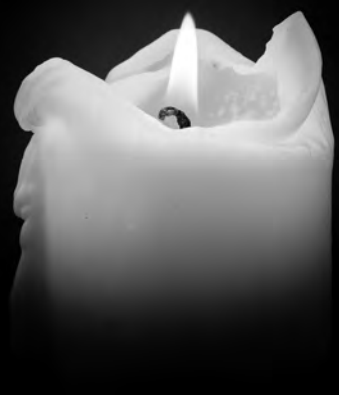

CHANGING ECONOMICS
OF RADIATION ONCOLOGY

In these first two articles, we examine both the effects of digital health on the general house of medicine's economics and the trends in treatment delivery and their impact on practice economics specific to radiation oncology.

The Transformative Effects of Digital Health

BY EZEQUIEL "ZEKE" SILVA III, MD

DIGITAL HEALTH, INCLUDING ARTIFICIAL INTELLIGENCE (AI), is significantly shaping economic discussions within health care. The technology and policy decisions around this topic are evolving so quickly that the impacts may not be apparent to all readers. The COVID-19 pandemic accelerated the growth of digital health due to a perfect storm in the innovation cycle: maturation of technology, consumer demand and supportive public policy. Entering the pandemic, many digital technologies were available with FDA approval for clinical use. Changes in public policy around telemedicine, remote physiologic monitoring, remote therapeutic monitoring and remote therapeutic management helped make these products more available.

The most significant public policy changes came in the form of 1135 waivers, which become authorized when: (1) the president declares a national emergency under the Stanford Act or National Emergencies Act and (2) the Secretary of the Department of Health and Human Services (HHS) declares a public health emergency (PHE) under Section 319 of the Public Services Act.[1] Named after Section 1135 of the Social Security Act, 1135 waivers allow HHS to modify Medicare requirements to address the state of emergency. For example, the infectious nature of the novel coronavirus required distancing between physicians, fellow health care workers and their patients — a circumstance requiring accommodations. By mid-2020, policymakers had established waivers allowing payment parity between telemedicine services and comparable office-based evaluation and management services, expanded patient access to telemedicine, including audio-only services, and expanded coverage for remote patient monitoring.

The result was rapid growth in the use of these digital technologies, particularly telehealth. One could think of this circumstance as one of the largest pilot studies in the history of mankind. But with study comes the responsibility to interpret experience and evaluate outcomes. After the PHE, when the 1135 waivers no longer apply, which policies will stay? Which will expire? Which will remain under consideration? Will the expanded access to telemedicine remain? Will remote patient monitoring grow to include additional clinical conditions? And from an economic perspective, how will government, private payors, physicians and consumers pay for this expansion of services?

AI evolved considerably during the time of the PHE. This is somewhat by coincidence, but it is also somewhat driven by the expansion of digital health described above. All digital health products involve software, often including AI algorithms to inform their output. In April 2018, the FDA approved the first autonomous machine learning (ML) algorithm in clinical practice for a product used to screen the retina for diabetic retinopathy changes.[2] This approval occurred via the FDA's de novo pathway, which is different from the more common 510(k) pathway. The 510(k) pathway requires that a predicate device be identified to which substantial equivalence for the new product is proven. De novo products are sufficiently novel for which there is no legally marketed predicate device. Since early 2018, dozens more AI products have gained FDA approval through clinical trials utilizing ML algorithms. The products are entering clinical practice at an unprecedented pace, raising questions for physicians.

One critical question relates to the way ML algorithms learn. ML algorithms "learn" from training data sets, referred to as supervised (applying annotated or labeled data sets) or unsupervised. Once deployed into clinical practice, the algorithm theoretically could be allowed to continually learn from new data presented to it, referred to as a continuously learning system (CLS). Or the algorithm could be locked such that the training, and hence output, is not altered based on new data presented to it. Hybrid systems allow both. Currently, the AMA does not support the use of any CLS in clinical practice due to the potential for uncertain clinical outcomes and inconsistency with previously supportive clinical trials. Data scientists, however, may argue that continuous learning optimizes the algorithm to adapt to new data — in our case, patient-specific data presented to it. Therefore, physicians and developers must decide if CLS will ever be allowed in clinical practice and, if so, how it will be regulated in practice for optimal patient care.

Quality and Standardization of Data

The expansion of AI has occurred due to the convergence of improved computer algorithms, growth in computing power and storage, and expanded availability of data. One key aspect of this potential is the quality and standardization of data. The underwhelming performance of IBM Watson in health care highlights the limitations of data. Watson had the potential to gather massive amounts of literature, patient data and evolving studies to inform care on a patient-specific basis. But, in the end, Watson could not overcome the wide variation in data presented to it to inform its clinical recommendations. Data from different health care databases, electronic health records, institutions, government payors, private payors and even simple doctor notes were too inconsistent and heterogeneous to allow practical, applicable clinical determinations and recommendations. Physicians often found Watson's recommendations unhelpful, impractical or illogical.[3] The fact that ML does not always allow the easy identification of its determinative methods (referred to as explicability or explainability) heightened these concerns around its output and recommendations. Based on this experience, the call for greater interoperability and data collection standards among data bases is high. The circumstance is somewhat analogous to the development of the Digital Imaging and Communications in Medicine (DICOM) standards in the early 1980s.

AI's greatest, immediate impact may involve the acceleration of therapeutic development. Take, for example, Christian Anfinsen's theory shared in 1972 that a protein's amino acid sequence should fully determine its structure. What followed was a 50-year quest to computationally predict 3-D protein structures based solely on the known amino acid sequence. Related, in 1969 Cyrus Levinthal noted that it would take longer than the universe's known age to calculate all possible configurations of a typical protein. And yet, proteins in real life fold spontaneously. This dichotomy has been referred to as Levinthal's paradox. Remarkably, in 2018, this 50-year problem was solved in a matter of minutes by Google DeepMind's AlphaFold. This is the potential role of algorithms in accelerating drug development to unprecedented levels of speed.[4]

The rapid growth of Software as Medical Devices (SaMDs) has prompted payment policy discussions with payment implications beyond software. The Medicare Physician Fee Schedule (MPFS) payment has three components: work, practice expense and malpractice. The effects of SaMD, especially AI, on physician work remains an open question but one which policymakers are actively exploring. In the 2022 MPFS Notice of Proposed Rule Making (NPRM), CMS asked the following questions: "To what extent are services involving innovative technologies, such as software algorithms and/or AI substitutes and/or supplements, for physician work? To what extent do these services involving innovative technology inform, augment, or replace physician work?"[5] Given the fact that many AI applications could be used on many, if not most, established physician services, the answer to the physician-work question is far-reaching. Does AI make work less by replacing physician-work activities? Or does it make the work greater by increasing the amount of available patient data and increasing intensity of decision making? And what effect does the associated greater or lesser time have on work?

Payment Implications

Practice expense (PE) around AI has similarly important payment implications, especially for capital intensive specialties, like radiation oncology. In the 2022 MPFS NPRM, CMS asks the following question: "How is innovative technology, such as software algorithms and/or AI, changing cost structures in the physician office setting? Do costs for

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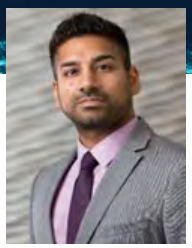
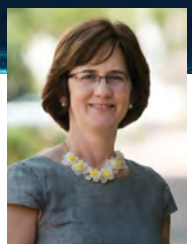
innovative technology, such as software algorithms and/or AI, to furnish services to patients involve a one-time investment and/or recurring costs?" Understanding these questions requires discussion of the broader CMS PE methodology. The methodology is complex, but two variables are especially relevant: direct and indirect expenses. Direct expenses are CPT code-specific, such as clinical staff, supplies and equipment. Indirect expenses are more general, such as utilities, furniture and some computer hardware and software. Where SaMD resides in the methodology is relevant, because indirect specialty-specific costs are based on a survey called the Physician Practice Information Survey (PPIS), administered in the mid-2000s. At that time, SaMD was not as widely applied and, therefore, not captured in the PPIS data. CMS, in the 2021 NPRM notes, "We wrote that as the data used in our PE methodology have aged, and more services have begun to include innovative technology, such as software algorithms and AI, these innovative applications are not well accounted for in our PE methodology. We have considered most computer software and associated analysis and licensing fees to be indirect costs tied to costs for associated hardware that is considered to be medical equipment."[6]

Accordingly, if software is presently characterized as indirect, then those expenses are not captured in the final PE payment. CMS recognizes this challenge and has actively discussed acquiring updated PPIS data to update indirect allocations. On the one hand, this has the potential to capture software-related costs more accurately. On the other hand, any survey of expenses brings uncertainty to future payments across the fee schedule, given the budget-neutral nature of the MPFS. Furthermore, future practice surveys will require considerable effort and resources by such medical organizations as ASTRO, physician leaders and practice administrators.

Ensuring that digital technology, including AI, grow in a high-quality and trustworthy environment has ramifications across health care. The acceleration of these technologies stands to have not only transformative effects on health care delivery but also unpredictable effects on existing delivery models and payment systems. These transformative effects are now squarely in the regulatory space in a way that will be meaningful for years to come. Decisions around those regulations will involve multiple stakeholders — physicians; innovators; industry, federal and state policymakers; and consumer groups, among others.

Ezequiel Silva III, MD, is one of the American Medical Association's (AMA's) most important voices on physician payment. He is the chair of the AMA/Specialty Society Relative Value Scale Update Committee (RUC) and is an authority on how shifts in science and technology should affect payments. He is an interventional radiologist at South Texas Radiology Group in San Antonio.

View references for this article at www.astro.org/Spring22News.

BY CATHERYN YASHAR, MD, FASTRO; AMAR REWARI, MD, MBA; AND ANNE HUBBARD, MBA

The Changing Practice of Radiation Oncology

Current Trends in Treatment Delivery and the Impact on Practice Economics

WHILE MANY IMPUGN the pharmaceutical industry for the explosive growth in health care costs, there is no denying that the existing fee-for-service system also incentivized inefficient care across all specialties. The mantra was "heads in beds" or for radiation oncology "charge per click," which increased utilization, particularly for technologies like IMRT. The focus on volume generation drove unrestrained health care spending and the subsequent, urgent need to shift toward value-based payment. Value-based payment replaces volume with quality and patient outcome incentives. In addition, value-based payment invests in disease prevention, early diagnosis, prospective patient management and higher reimbursement for primary and preventive care services with the expectation that these investments will reduce health care expenditures. This trend in health care investment has shifted payment away from specialty care by $10B over the last decade in order to maintain budget neutrality within the existing Medicare Physician Fee Schedule (MPFS) payment system.

Practice and Payment Innovation in Radiation Oncology

In 2008, the Centers for Medicare and Medicaid Services (CMS) speculated that technological advances in IMRT delivery had created a disconnect between cost and reimbursement. This triggered payment cuts beginning in 2009 and forced the American Medical Association's Relative Value Update Committee (RUC) to revalue the entire radiation oncology treatment delivery and image guidance code set. ASTRO arduously worked with the RUC over a multi-year process toward a fair revaluation, which was disregarded by CMS in the 2015 MPFS. ASTRO sought congressional intervention to avoid additional payment cuts and establish rate stability through the passage of the Patient Access and Medicare Protection Act (PAMPA).

That same year, Congress enacted the Medicare and CHIP Reauthorization Act (MACRA) replacing the Sustainable Growth Rate with the Quality Payment Program (QPP). QPP was operationalized in 2017 and established a two-prong approach to shift payment from fee-for-service to value-based payment, launching the Merit-based Incentive Payment System (MIPS) and Advanced Alternative Payment Model (Advanced APM) programs.

ASTRO long considered the stability advantages provided by alternative payment models for radiation therapy services. The MACRA Advanced APM construct served as an opportunity to decouple volume from value, assuring advances, such as hypofractionation, were viable from a clinical and financial standpoint. However, with the increased use of hypofractionation, each fraction carries increased risk as well as increased value, as small deviations will be relatively magnified.

Conversations with CMS on the development of an Advanced APM for radiation oncology were initially dismissed; however, PAMPA also included a provision requiring CMS to report to Congress on the viability of a radiation oncology APM. ASTRO generated a payment model construct for the agency's consideration and the obligatory report was issued to Congress in November 2017. The report aligned with ASTRO's recommended construct, which generated the needed momentum to encourage continued CMS/ASTRO collaboration on APM development.

In July 2019, when CMS released the RO Model proposed rule, ASTRO was shocked by the unexpected layers of additional payment cuts and administrative burdens applied to the initially straightforward concept. A comprehensive comment letter was submitted to the agency seeking specific remedies to legitimate concerns, notable errors and profligate ambiguities raised by the proposed rule. Unfortunately, ASTRO's factual concerns, the majority of which are shared by the broader radiation oncology stakeholder community and Congress, were substantively ignored in the September 2020 final rule and in subsequent regulatory notices.

Of primary concern is that the model does not recognize that

Continued on following page

many practices have already shifted towards hypofractionation, limiting the ability to generate any additional savings. Rather than recognizing and rewarding early adopters, the model significantly punishes value-based practices relative to practices recalcitrant to adopt national guideline-recommended hypofractionation.

Additionally, despite ASTRO's advocacy, the agency failed to recognize the significant fixed costs associated with operating a radiation oncology clinic. CMS stated that "payment rates are not designed to account for the investment decisions of practices." Clearly, there is a substantial disconnect between shifting to value-based payment and ensuring that radiation oncology practices remain financially viable. To ensure that Medicare beneficiaries have regional access to the best care, practices must retain the ability to maintain existing equipment, invest in new equipment, service lines and technological advancements, otherwise innovation is stifled, and health care disparities are exacerbated.

MPFS Practice Expense Methodology

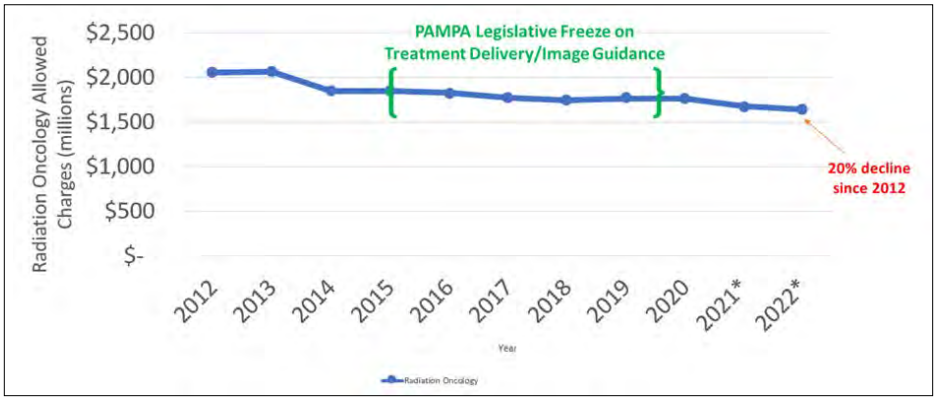
Payment rates under the MPFS are based on three distinct components: Physician Work, Practice Expense (PE) and Malpractice Liability. The average breakdown in payment across the fee schedule between the three components is 51% Physician Work, 45% PE and 4% Malpractice Liability. For radiation oncology, due to the significant equipment expense, the ratio is closer to 25% Physician Work and 75% PE. Practice Expense is split between direct (clinical staff and durable equipment/supplies) and indirect expenses (practice administration and overhead).

Over the past decade, ASTRO has vigorously defended the current PE methodology as it relates to radiation oncology. In 2016, CMS removed on-board imaging from the direct PE formula for IMRT and IGRT and reduced the value of the linear accelerator. These changes negatively impacted radiation oncology payment rates. The agency also increased the equipment utilization rate from 50% to 60%. A higher utilization rate anticipates that equipment is being used more frequently, thus a smaller charge for its use is applied to the payment rate for each service. CMS continues to scrutinize equipment utilization rates, threatening future increases, which will represent additional payment cuts for radiation oncology services.

CMS has identified a number of concerns with the existing PE methodology, namely the inability to verify direct cost estimates and the flawed allocation methodology for indirect costs as reasons for revising the methodology. Further complicating CMS' modifications is the fact that PE must remain budget neutral. Thus, changes reverberate across specialties in both negative and positive ways. In 2019, CMS updated the supply and equipment rates, impacting a number of radiation oncology services, but none were as severely impacted as SRS/SBRT. The SRS/SBRT system equipment item ER083 was reduced by 25%, which has subsequently reduced reimbursement for SRS and SBRT treatment delivery codes over the last four years.

In January 2022, CMS updated the Clinical Labor Price inputs. While this was a positive development for valuing the work of the medical physicist, dosimetrists and radiation therapists, it came at the cost of reducing the value of medical services reliant on expensive equipment, like radiation oncology, to the tune of $3.5B. Despite phasing the update in over a four-year period, the first-year impact on top radiation oncology services ranges from -6% to -11%.

Figure 1: Decline in MPFS rates over 10 years



Over the last decade, radiation oncology has experienced a 20% decline in MPFS rates as a result of these methodology changes. The chart on the previous page demonstrates the incremental decline that has occurred, including the period in which PAMPA secured a modest amount of rate stability.

The Challenge that Lies Ahead

The summation of these changes put radiation oncology in a problematic and tenuous position. The care radiation oncology delivers in 2022 is more efficient, targeted and personalized with fewer complications and demonstrably improved patient outcomes compared to a mere 10 years ago. This type of care is delivered by technological innovations that are increasingly sophisticated and more expensive. These innovations, as in the drug industry, required immense investments for research and development that are passed on to the specialty. To provide this superior level of care requires not only an initial investment but continuous maintenance for safe delivery. None of this is recognized or rewarded in the current fee-for-service payment system nor the RO Model. This is simultaneous with regular and time-consuming questioning of the physician's clinical judgement by oncology benefits managers, whose aggressive tactics prioritize reducing health care costs on behalf of payers over the physician-patient decision making process.

While the truth sounds grim, it is challenges like these that force us to think differently and consider new approaches. New approaches could include elegantly formulated capitated payment arrangements, similar to the RO Model, that decouple payment from volume, thereby encouraging greater practice efficiency, while protecting those who have already achieved those efficiencies. Such an approach would also provide radiation oncologists with the opportunity to pursue joint decision making with the cancer patients rather than payers and even provide opportunities to pay for wraparound services for those patients who require more support to initiate and successfully complete treatment.

Finally, we must protect accurate and reasonable valuation of radiation oncology equipment and ensure that practices are appropriately incentivized to continue investing in technology. As the PE methodology evolves, it will be incumbent on the field to engage with CMS on the challenges related to high fixed capital expenses. While we can appreciate the need to shift payment to primary care and other preventative medicine services, it should not be pursued at the expense of specialty care that is also of high value.

These strategies require more analysis, collaboration and discussion, but they are worthwhile endeavors, particularly given the current circumstances. Radiation oncology as a field is constantly evolving as technology advances, and the payment system must evolve to meet current and future demands, otherwise the field risks a race to the bottom.

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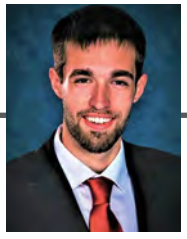
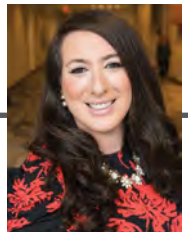
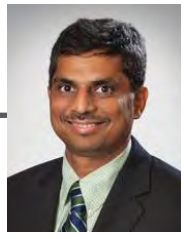
How Do We See What We Don't See

as radiation oncologists?







BY STEPHEN ABEL, DO, MHSA; JENNA KAHN, MD; AND SUSHIL BERIWAL, MD, MBA, FASTRO

RADIATION THERAPY (RT) HAS LONG BEEN ONE OF THE PILLARS of cancer-directed therapy and continues to have a role in both the palliative and definitive management of a wide range of malignancies. In recent years, there is growing concern regarding the decremental patterns of RT utilization partly due to increased usage of hypofractionation and in some disease sites, declining therapeutic indications. Nevertheless, these somewhat obvious sources of decreased radiotherapeutic utilization may be just the tip of the proverbial iceberg.

Current estimates suggest RT is used to some capacity in approximately half of all cancer cases.[1] However, when comparing actual RT utilization rates to estimated optimal utilization rates (models derived from evidence based and criterion based guidelines), several studies have reported actual rates of utilization to be lower than expected.[2,3] When all disease sites are considered, the actual RT utilization rate is 5-15% below the expected utilization rate. This trend of RT underutilization has been suggested across multiple disease sites and in many cases, is much more pronounced (Table 1).

Although the importance of comprehending why the underutilization problem exists should not be understated, perhaps a more critical question is how to effectively address the issue. One potential reason for underutilization is patient preference.

Patients may be referred for radiation oncology consultation and choose against treatment despite its indication. In these circumstances, patients may elect for omission of treatment altogether (i.e., observation) or choose to pursue a separate treatment modality (recommended or not). Strategies aimed at increasing patient education such as use of handouts, videos and other decision aid tools, as well as references, including ASTRO's RTAnswers, may help better inform patients.

Table 1: Reported radiation therapy underutilization rates by select disease site

Disease Site	Underutilization Rate
Stage III Non-Small Lung Cancer	15%[4]
Glioblastoma	24%[5]
Lung Cancer (SCLC and NSCLC, all stages)	25%[4]
Inflammatory Breast Cancer	30%[6]
Early-stage High Risk Endometrial Cancer	47%[7]
Stage I Follicular Lymphoma	70%[8]
Muscle Invasive Bladder Cancer	75%[9]

Another potential reason for lower-than-expected RT utilization rates relates to patient access to care, which can be further divided into two subsets: patient-related barriers and physician-related barriers.

Regarding patient barriers, the patient may have physical, psychosocial, demographic, geographic and/or financial limitations that prevent access to treatment. Although a general trend toward more abbreviated treatment courses has been reported in recent years, compliance with daily outpatient treatment remains a challenge for certain populations. Potential strategies to mitigate patient-related barriers include early identification of potential barriers through routine discussion at multidisciplinary tumor boards; increased incorporation of psychologists, social workers, nursing and other ancillary support services into the patient care paradigm; and development of financial and transportation support programs.

In contrast, physician-related barriers may also limit patient access to radiation treatment and can be a function of upstream referral, or lack thereof. Failure to refer patients with indications for RT may be a result of several factors, including inherent biases toward one's own specialty (or against another); lack of awareness regarding the radiotherapeutic indication; and/or misconceptions regarding the safety and/or efficacy of RT.

Many technological advances have occurred over the last two decades allowing for more accurate, efficacious and safe delivery of RT. It is our responsibility to educate both our oncologic colleagues and trainees alike of these advances and how they can be more effectively integrated into the overall treatment paradigm. Specific examples include informing colleagues of the emerging role of SBRT as a potential alternative to surgery in early-stage NSCLC and as a means of local consolidative therapy in oligometastases. Educational advancement may take place at the tumor board or during dedicated presentations such as grand rounds or trainee lectures. At a larger level, educational resources like RTAnswers, endorsed by representative professional organizations, could consider promotion of new technologies and treatment indications via media, social media or conference events. Regardless of the forum, tactful education may help quell misunderstandings, provide enlightenment and strengthen interdisciplinary communication overall.

In addition to advancing the education of both referring providers and medical trainees, stronger advocacy for the field and increased visibility in the overall care of the patient may positively impact perspectives toward radiation oncology. Multidisciplinary clinics, where potential patients are evaluated in conjunction with medical or surgical colleagues, can improve working relations as well as provide the patient with a holistic overview of treatment options. This approach has been particularly successful in prostate cancer and could be expanded into other disease sites where there is significant radiotherapeutic underutilization, such as muscle invasive bladder cancer (MIBC). Bladder preservation is significantly underutilized in the United States compared to Europe, and despite changes in NCCN guidelines (concurrent chemoradiotherapy is a category 1 recommendation for MIBC), rates of bladder preservation remain low.[9] Incorporating multidisciplinary clinics for diseases like MIBC would allow for upfront presentation of all available treatment options, which could serve as a renaissance for bladder preservation in the treatment of MIBC.

Lastly, assessment of internal tumor registries within the health network can both objectively elucidate disease sites of treatment underutilization and serve as a barometer to assess the effectiveness of an intervention on referral patterns.

Altogether, the decline in use and underutilization of RT in some disease sites is primed for a revival. Improving patient and provider education and advocacy can improve understanding of available treatment options as well as the technological advancements in our field. Advocating for multidisciplinary clinics and tumor boards along with education for trainees can improve visibility and change practice patterns. As radiation oncologists, we can be those gatekeepers in expanding our field.

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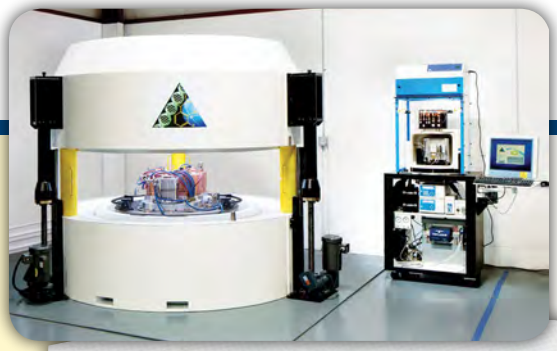

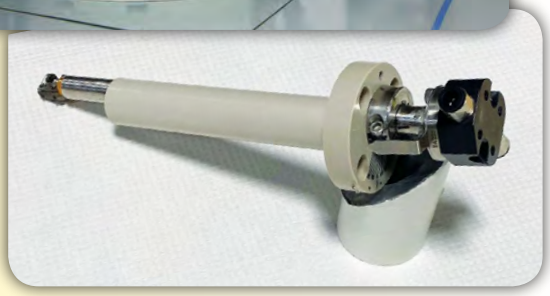

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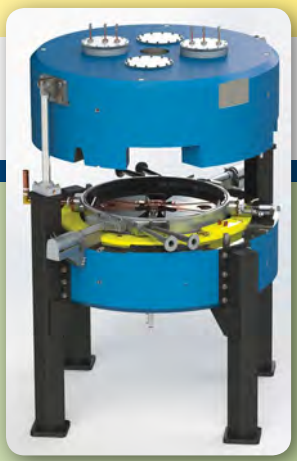

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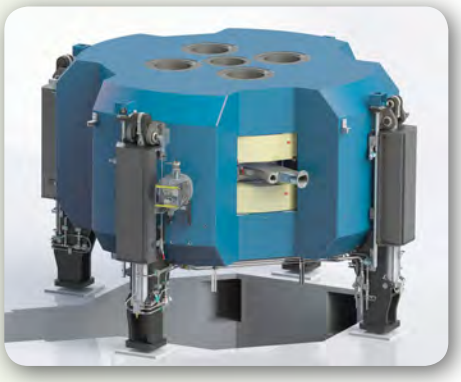

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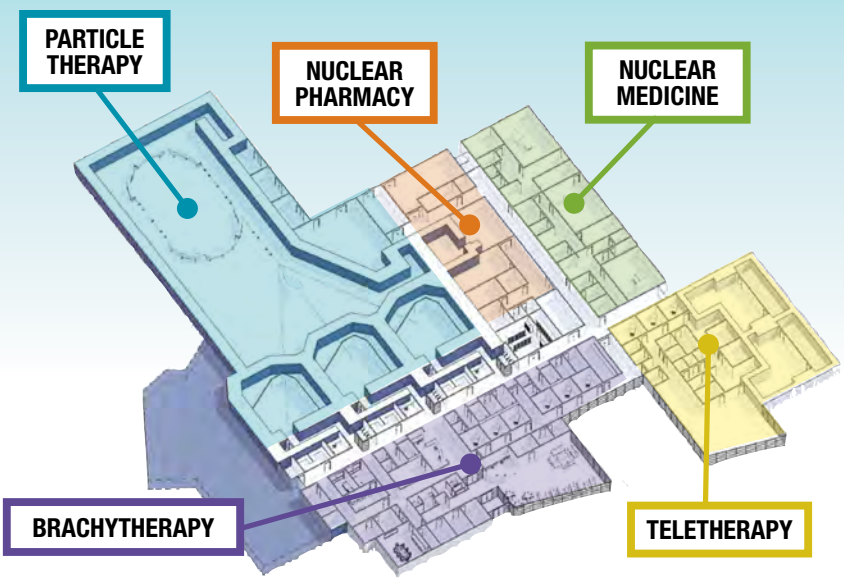

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INTERNATIONAL PERSPECTIVE

Variation in Reimbursement Structure Worldwide

BY GUSTAVO NADER MARTA, MD, PHD, AND PHILIP POORTMANS MD, PHD

THE DEFINITION OF REIMBURSEMENT comprises the model in which capital is transferred from health care funders to health care providers. Criteria, including quality of care, acceptability and accessibility, are often related to reimbursement. Depending on its structure, reimbursement can function as an instrument capable of stimulating the implementation of health care innovations, including new technology or, all too often, it can encourage health care providers to adhere to the current practices. In many circumstances, the reimbursement model is unfortunately used as a cost-containment instrument rather than as a stimulus toward improving efficiency and quality.[1]

The way in which a new procedure and/or technique is reimbursed usually reflects its significance or, in other words its value, as rated by the paying sources. The system of reimbursement used in a nation offers insights into how its health care system deals with financial compensation for services related to specific treatments.[1]

Aspects related to health care policies, financing and reimbursement are notorious challenges in the oncology context worldwide due to their intrinsic impact on the dynamics of research, the flexibility toward accommodating the increasing number of patients and the rapid implementation of innovations in cancer care.[1] Indeed, the increasing cost of novel cancer treatments absorbs an increasing share of the health care financial plan of any country. This is becoming unsustainable, and further increasing unequal accessibility to optimum health care. The judgment about how and when new treatments should be reimbursed is a key point, since reimbursement is a crucial obstacle to the implementation of novelties that can offer clinically relevant advances in clinical outcomes.[2] An optimized health care organization requires numerous operational systems and instruments to measure quality indicators, such as availability, accessibility and acceptability, and ultimately outcomes. Based on that, legislation and governmental models for reimbursement are developed. In general, the mechanism of reimbursement can be classified into two groups: separate fees per activity (fee-for-service) or lump sum for the entire treatment (fixed fee).[3]

Overall, the budget for radiation therapy is estimated to be 5% of the annual amount dedicated for oncology expenses and hence represents less than 1% of the overall health care financial expenses.[3] Although these values seem quite insignificant compared to the total health care budget, it is common that implementation of new radiation therapy techniques, including hypofractionation regimens, are set to compete with other requests unrelated to radiation oncology, which may even result in reduction of the existing reimbursement. While radiation therapy schedules are increasingly moving toward moderate- and ultra-hypofractionation based on solid evidence, reimbursement issues directly impact its implementation in clinical practice. It is evident that the incorporation of shorter fractionation regimens depends on the refund policy adopted by each country.[3-5]

Table 1 shows the basis of reimbursement and the potential impact of moderate hypofractionation-based radiation schedules for breast cancer on revenue of 13 countries from six continents.[3] Of note, although reimbursement rules diverge meaningfully between private and public sectors and different countries, the monetary loss observed by a reduction in amount reimbursed per patient due to the use of hypofractionation-based regimens is often considerable and relatively comparable across countries. Importantly, in countries where reimbursement is independent from the number of fractions (e.g., Netherlands and UK), hypofractionated breast irradiation is standard for all patients, except for cases of re-irradiation and concomitant chemoradiation. Alternatively, in regions where reimbursement models are based on payment per fraction (e.g., Germany, France and USA), reluctance persists towards the incorporation of hypofractionation in daily practice.[4]

It is important to recognize that fewer radiation therapy fractions require optimal planning and delivery of high radiation quality. The outdated system of paying by the number of fractions is senseless and counterintuitive and is hampering introduction of

evidence-based shorter therapies. Considering that treatment using fewer fractions might cost relatively more to be planned and delivered than conventional fractionation, it is imperative to implement a remuneration system based on indicators such as complexity rather than number of sessions.

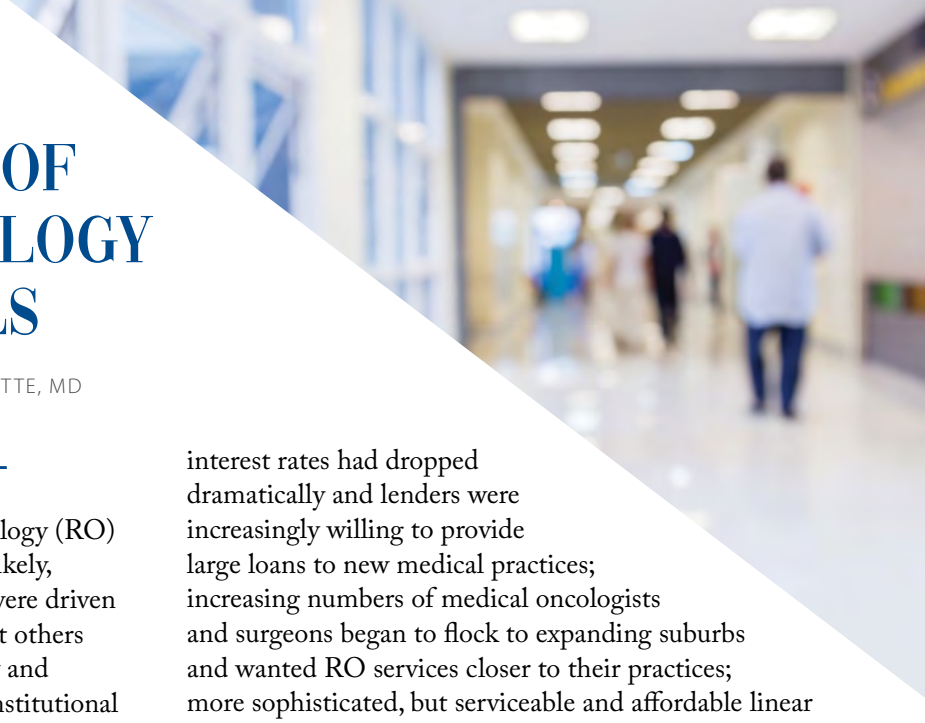
Radiation therapy has advanced extensively throughout the past 20 years, with innovative techniques allowing more efficient and precise treatments with less side effects, thus permitting

Continued on page 25

Table 1: Basis of reimbursement and potential impact of moderate hypofractionation-based radiation schedules for breast cancer on revenue

Republic	Clinical practice	Reimbursement practice	Does total number of fractions influence of the reimbursement?	Economic deficit generated by the reduction in income per-patient from using an hypofractionation-based
Australia	Public practice	Separate fees per activity	No	–
	Private Practice			
Brazil	Public practice	Lump sum for the entire treatment (fixed fee)	No	–
	Private practice	Lump sum for the entire treatment (fixed fee)	No	–
	Private practice	Separate fees per activity	Yes	10 – 20%
Canada (Quebec)	Public practice	Separate fees per activity	Yes	5 – 10%
	Private Practice	–	–	–
Canada (Nova Scotia)	Public practice	Lump sum for the entire treatment (fixed fee)	No	–
	Private Practice	–	–	–
Denmark	Public practice	Separate fees per activity	Yes	30 – 40%
	Private Practice	–	–	–
France	Public practice	Separate fees per activity	Yes	30 – 40%
	Private Practice	Separate fees per activity	Yes	30 – 40%
Israel	Public practice	Separate fees per activity	Yes	30 – 40%
	Private practice	Separate fees per activity	Yes	–
Italy (Tuscany Region)	Public practice	Separate fees per activity	Yes	30 – 40%
	Private Practice	Separate fees per activity	Yes	30 – 40%
The Netherlands	Public practice	Lump sum for the entire treatment (fixed fee)	No	No
	Private Practice	–	–	–
South Africa	Public practice	Lump sum for the entire treatment (fixed fee)	No	–
	Private Practice	Separate fees per activity	Yes	30 – 40%
Spain	Public practice	Lump sum for the entire treatment (fixed fee)	No	–
	Private practice	Lump sum for the entire treatment (fixed fee)	No	–
Taiwan	Public practice	Separate fees per activity	Yes	20 – 30%
	Private Practice	Separate fees per activity	Yes	20 – 30%
United Kingdom	Public practice	Separate fees per activity	Yes	30 – 40%
	Private Practice	Separate fees per activity	Yes	30 – 40%
United States	Public practice	Separate fees per activity	Yes	20 – 30%
	Private Practice	Separate fees per activity	Yes	20 – 30%

Note: Modified from Marta GN et al. *Clin Oncol (R Coll Radiol)*. 2021 May;33(5):322-330.



THE EVOLUTION OF RADIATION ONCOLOGY PRACTICE MODELS

BY PAUL E. WALLNER, DO, FASTRO, AND ARVE GILLETTE, MD

SINCE EMERGING AS A PRIMARY MEDICAL SPECIALTY in the 1960s, practice models for development and ownership of radiation oncology (RO) facilities have demonstrated progressive, and likely, inexorable evolution. Some of these changes were driven by factors relatively unique to the specialty, but others followed general trends in health care delivery and funding experienced by many physician and institutional medical care providers.

Prior to the 1960s, clinical RO programs were relatively uncommon and almost entirely housed and managed as clinical services within diagnostic radiology departments. Trainees were overwhelmingly general radiology residents who might take a RO rotation as part of their three-year program. In the early 1960s, visionary RO leaders began to urge development of dedicated RO clinical services, training programs and certification. As those proposals were adopted, the specialty grew in number of facilities and physicians. The enactment of Medicare and Medicaid in 1965, associated with more reliable commercial RO payment, provided additional financial support for growth of the specialty. However, a number of factors effectively assured that growth would be almost entirely limited to academic health centers and large community hospitals: interest rates were at historic highs, reducing individual borrowing capacity, but hospitals were awash in low-interest loans made possible by the post-World War II Hill-Burton legislation; commercial availability of megavoltage radiation equipment was beginning, but the available units remained expensive and complex; the availability of ROs, medical physicists and dosimetrists failed to support rapid expansion of centers; medical and surgical oncology programs were generally limited to academic centers and large community hospitals; and the benefits of RO in a myriad of cancer presentations was just becoming evident.

In the late 1970s and early 1980s, clinical and market forces led to changes in the practice model: academic RO departments continued to expand, but the increasing number of graduates could no longer be absorbed or had little interest in remaining in the academic setting; interest rates had dropped dramatically and lenders were increasingly willing to provide large loans to new medical practices; increasing numbers of medical oncologists and surgeons began to flock to expanding suburbs and wanted RO services closer to their practices; more sophisticated, but serviceable and affordable linear accelerators, treatment planning computer systems and CT-simulators became available to provide services previously limited to the academic setting.

Expansion of RO Programs

The post-World War II growth of suburban rings also saw a rise in consumers who demanded greater availability of local educational, cultural and health care services. The rise of health maintenance organizations (HMOs) providing payment for many services by capitation, encouraged individuals and small groups to develop multiple sites of service to cover broader capitated populations. These groups often maintained both hospital-based and free-standing practices, sometimes as joint ventures with their hospital "partners." The rapid expansion of non-profit hospitals often found them burdened with significant capital demands, so they frequently encouraged individual physicians and physician groups to develop nearby oncology services. Preferred Provider Organizations (PPOs) practices were incentivized to expand and merge with other similar groups to serve increasingly larger populations and have beneficial negotiating positions with payers. Medical and surgical specialists had been forming longitudinal practices for many years, and RO practices began developing or joining integrated multispecialty oncology groups. The ultimate demise of many HMOs placed these large multi-specialty groups in a favorable financial position as more patients returned to payment under a fee-for-service system. Ultimately, some of the same hospitals that had encouraged independent practices to expand began to develop their own subsidiaries, which either created new RO programs, purchased existing groups or pressured creation of joint ventures.

The widespread marketplace penetration of IMRT in the early 2000s provided significant new sources of technical revenue. While this proved beneficial to RO facilities and their owners, it also incentivized non-ROs, especially urologists, to develop their own RO facilities. This development was enabled by the "in office ancillary exemption" of the Stark self-referral laws. During this period, entities known as physician practice management firms (PPMs) rapidly entered the marketplace. With the promise of reduced administrative burdens, IT support, access to capital and improved payer contracting, these firms were quickly embraced by individual and group practices, but the promises were often unmet and many of these firms disappeared.

Expansion of Investors

With expansion of regional RO groups, entrepreneurial leaders saw opportunities to acquire or develop additional sites, and ultimately, several of these groups had a large, longitudinally integrated national presence. As these organizations attained extraordinary size, geographic distribution and revenues, they attracted interest from institutional investors, especially private equity firms and hedge funds. This phenomenon was not unique to RO, with similar developments in dermatology, anesthesiology, emergency medicine, family practice and multi-specialty groups. As early as 2016, a report by Zhu suggested almost 20% penetration of non-physician investor ownership of these practices. Many medical specialties remain attractive to outside investors because of generally high liquidity in capital markets, a view that health care remains recession-proof thus reducing risk, high practice valuations, ability to generate income for related entities, and positions as "platform" services with dominance in regional markets.[1,2]

The establishment, growth and ultimate path of two of the country's largest integrated oncology practices exemplify the variability of market trends, their interest within the commercial and investment community, and how those divergent paths may lead to a similar conclusion.

Texas Oncology, PA (TOPA) began as a medical oncology group in Dallas in the mid-1980s. As the practice expanded, pharmacy, gynecologic oncology, and where possible, RO services were added to existing practice sites and included in newly developed sites. The organization grew exponentially and joined with U.S. Oncology Network (USON), essentially a PPM that provided services to the TOPA group. At the time, USON had over 200 sites under management. With additional large organizational relationships, USON was ultimately purchased by a private equity firm in 2004, for more than $1B, and in 2010, was sold to McKesson, Corp. for over $2B. McKesson later purchased other large integrated oncology groups. McKesson is a publicly traded international company headquartered in Irving, Texas, specializing in pharmaceutical sales, health information technology, medical supplies, and care management tools. In 2021, it reported over $200B revenue with more than 78,000 employees.[3]

Radiation Therapy Services, Inc. (RTSI), was founded in 1983 as a single, physician-owned RO facility. As the group added facilities by asset acquisition, internal development and joint ventures, non-RO practices were integrated. What later became 21st Century Oncology Inc., ultimately grew to more than 120 RO sites in the U.S. and South America. The company was initially held privately, was later publicly traded, and then again, taken private. A series of financial and legal setbacks led to bankruptcy, with rescue by private equity and hedge funds. In 2020, the company was purchased for a reported $1.5B by GenesisCare, a company founded in Australia in 2005 with a single cardiology facility. GenesisCare is currently a provider of cardiology, oncology, pulmonary and other clinical services in Australia, New Zealand, England, Spain and the U.S. It is privately held, with over 440 clinical sites and more than 5,000 employees.[4]

Authors Note: This article is intended to provide some history and current context, especially for those who have entered RO relatively recently. Space constraints permit only superficial discussion of the various practice models described and their myriad nuances. In preparation of this manuscript, the authors have generally relied on personal experience and observations. Both are employees of non-physician-owned corporations, but both also have experience with each of the models described. Because of state-based corporate practice of medicine and certificate of need laws, local and regional practice models may differ in timing, definition, and extent, and even within generalized models, individual physician and/or facility relationships may differ. The designation of "corporate ownership" should be avoided as a discriminator, because even in single facility practices or the academic setting, physicians are typically employed by a corporate entity. As groups have grown, non-physician managers are frequently employed, but often, physician leadership is retained. With outside investment, those physician corporate leaders are often

Continued on page 23

An Alternative Pathway for Alternative Payment Models

BY LUCA F. VALLE, MD; ANN C. RALDOW, MD, MPH; AND MICHAEL L. STEINBERG, MD, FASTRO



THERE WAS A TIME when the only exponential growth curves that troubled radiation oncologists were those that modeled tumor growth. Now, the unsustainable rise in domestic health care spending has become an unavoidable reality for many of us, as the impact of rising costs without proportional improvements in quality or outcome continues to blunt the overall impact of the critical work we do.

Our legacy reimbursement system espouses a "bill per click" philosophy that asymmetrically favors technical payments over professional payments and is untethered to outcome measures. Because this unsustainable payment infrastructure is built for the system we have and not the system we need, change is both required and inevitable. However, at the same time we cannot meaningfully preserve the patient-centered values of our field if payors are myopically driven to haphazardly grind down payment for care by any means necessary. Indeed, the literature is rife with examples of how critical populations of cancer patients could be harmed[1] by these abrupt and sometimes irrational changes to reimbursement.

We are of the mind that the ideal payment platform will accomplish the cost saving mission in a way that is sensitive to the complexity of radiation oncology and drives the core patient-centered principles of our specialty forward. In this way, we avoid the dichotomy of "winners" and "losers" that so often characterize discussions of changes to payment policy and instead enable all stakeholders to profit from the necessary adaptations to payment in our field. Rather than winners or losers, there will be providers who align their practice with the patient-centered mission of our field (and are financially rewarded accordingly) and providers who don't (and are financially penalized accordingly). These values, the nuances of which may be up for debate, must be fundamentally patient-centered and value-driven. They must also enable the technological and process of care innovations that are critical for the advancement of radiation oncology. In the world of alternative payment models, value reigns supreme, so it's worth spending a moment focusing on the "value of value." We have come to define[2] value in radiation oncology as quality (structure, process and outcome)/cost, and we must reward practices who prioritize and objectively demonstrate their commitment to increasing the features in the numerator while decreasing the cost denominator. Remunerable commitments to structure might look like participation in accreditation programs (e.g., APEx) that seek to ensure a minimum standard for keeping patients safe from an infrastructure and staffing perspective, thus relating structure and process to outcome. Prospective peer review of radiation therapy plans, utilization of standardized dosimetric plan quality reports, implementation of incident learning systems, tracking of patient-reported outcomes,[3] and appropriate training in unconscious biases also tie in with measurable structural and process changes that pay real dividends in improving the quality of patient care. Rewardable process improvements might also take the shape of delivering evidence-based treatments that are more convenient to patients and their families. Increasing the proportion of hypofractionated and ultra-hypofractionated treatments represents the low-hanging fruit here, as is rewarding practices for completion of head and neck and cervical cancer treatments within expeditious evidence-based windows. Again, both examples of process improvements that are of great benefit to patients and simultaneously highly measurable in an objective fashion.

Fundamental health system rearrangements that address the pervasive disparities in access to quality health care in our country could also be rewarded with a novel payment model. For example, rewarding large health systems that invest new infrastructure in underserved communities while penalizing systems that operate and expand exclusively in high-income markets might also fight the growing health care disparities that exist largely as a function of place[4] alone. By aligning the incentives for our process of care with the best available evidence in a structured

environment that prioritizes patient safety and access to culturally competent care, we ensure the best outcomes for our patients in the most reproducible fashion.

On the subject of reducing the denominator of cost, practice-driven savings should conceivably be rewarded by a system where providers earn a credible percentage of the savings they generate, as featured in some Accountable Care Organization models.[5] In the current system, we have all seen examples of intentionally engineered practice patterns that drive up expense, so imagining this same ingenuity realigned toward effective care that nets savings in health care is a satisfying notion. Sadly, the CMS alternative payment model stresses withholds and downside penalties as opposed to real sharing of cost savings. The potential deleterious impacts of these changes are uncertain.

And finally, built into any reimbursement platform must be the understanding that radiation oncology is a highly technical field perpetually in a state of rapid technological evolution. This unique innovative dimension, which attracted many of us to the field in the first place, has time and time again proven to improve the therapeutic ratio[6] for our patients in novel ways. The costs associated with keeping up with this innovation (and indeed leading the charge for new innovation) are not insignificant, and any model that expects the continued rapid integration of new technology must compensate for this as well. This is of particular relevance in a context where improvements in technology also place an increased demand on human capital[7] in radiation oncology. After earning the aforementioned rewards, requiring re-investment of a certain percentage of that remuneration into technology, research or education is an intuitive approach to ensure continued innovation.

These aspirational tenets must be anchored in the truism that we will not succeed in meaningful change by fighting against the existing reality. Change will instead come from building a new platform that makes the old platform obsolete. And as we consider the latest CMS RO-APM, and indeed any new proposed model, a word of caution is warranted. We must espouse quality measures that are important to measure, not simply measures that are easy to measure, lest our specialty adopts the folly of rewarding A while hoping for B.[8]

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Continued from **THE EVOLUTION OF RADIATION ONCOLOGY PRACTICE MODELS**

replaced by investor representatives. In the current health care marketplace, increasing size and market share are deemed as positive advantages, and even academic centers are increasingly consolidating and growing by acquisition and new program development These academic centers frequently approach the size, revenue generation, marketing budgets and management salaries of large businesses. We have made no attempt to imply that any one model is "better" or "worse." As with most judgments regarding the health care enterprise, that determination ultimately remains within the "eye of the beholder." Changes that involve organizations, personal and societal culture, and financial gains or losses will ultimately have "winners" and "losers." If the ultimate determining metrics are patient outcomes, retention of physician clinical decision-making, quality, safety, value, maintenance of provider and patient satisfaction, and benefit to society, we suggest that the jury remains out.

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Actionable Modifications to the CMS RO-APM

BY AARON F. BUSH, MD, MARK R. WADDLE, MD, AND ROBERT C. MILLER, MD, MBA, FASTRO



"America's health care system is neither healthy, caring, nor a system"
– Walter Cronkite

WHILE SOME MAY VIEW renowned journalist Walter Cronkite's aforementioned quote as hyperbole, the perception of health care in the U.S. has become nearly synonymous with being inaccessible, broken and exceedingly expensive. Therefore, it was no surprise when the Affordable Care Act established the Center for Medicare and Medicaid Innovation (CMMI) with the goal of phasing out fee-for-service payments in favor of quality based payments. Following the boom of intensity-modulated radiation therapy (IMRT) and its associated increase in Medicare expenditures, the field of radiation oncology was one of the earliest specialties to trial an alternative payment model.

It should be clearly stated that the radiation oncology alternative payment model's (RO-APM) goal of replacing the existing fee-for-service structure with an episode-based payment methodology is both admirable and well-intentioned. Especially as radiation therapy (RT) becomes increasingly hypofractionated and complex, a reimbursement model that encourages value over volume is desperately needed. Unfortunately, as evidenced by the multi-year failure to implement the RO-APM, CMMI has yet to design a model that can practically realize its ambitions. Herein, we will describe actionable modifications to the current model that would allow for affordable value-based care while appropriately acknowledging the intricacies of RT.

First, the model should not be mandatory. Practices should be incentivized to join for the possible reward of shared savings, improved efficiency and payment bonuses based off applicable quality metrics. Forcibly and randomly implementing the model on 30% of all RT episodes is counterproductive in that it masks feedback on how well the model is being received and endangers practices unable to rapidly make such a drastic transition (notably, in rural and underrepresented communities).

Regarding the payment structure itself, we agree that episodic bundled payments are an appropriate change in certain situations, especially as hypofractionation becomes more prevalent. However, this model is overly ambitious. Focus should be narrowed to disease sites that have clear options for hypofractionation where adoption has been slow, such as breast and prostate cancer. Further, critical patient factors were ignored when designing this model, such as cancer stage. Cancer stage is key for the selection of treatment and our research shows that higher stage patients have historically higher costs to deliver care, likely due to larger treatment volumes and other treatment related factors.[1] Without considering the distribution of these factors among practices in design of the model, there may be practices, particularly rural practices seeing higher rates of advanced stage patients, that face a very real decision of financial viability versus standard of care practice. Additionally, intention matters, and palliative treatments, although appropriate for an episode-based reimbursement, should have a separate timeline from curative treatments given the unpredictable nature of the frequency of these treatments. For example, within a 90-day period one patient with painful bone metastases may only require one treatment while another could need several.

For those patients appropriate for bundled reimbursement, the calculation of base rates should be completely redesigned. To maintain site neutral payments, all treatment centers should be represented, and the economic climate of the field should be acknowledged. Yet, base rates are currently set to be only calculated from the historical average of fee-for-service claims using Hospital Outpatient Prospective Payment (HOPPS) data. Historical Medicare Physician Fee Schedule (MPFS) claims must be included in base calculations, which is only further highlighted by 8.75% in proposed cuts, which were partially averted via congressional action.

Adjustment factors must also be significantly modified. Discount factors should be removed entirely as they are an artificial construct that inhibits the ability to determine if the model itself decreases costs by improving efficiency and providing appropriate

site-neutral base rates. Additionally, linking payment to quality is critical to ensure cost saving practices do not harm patients. However, the current implementation using generic quality metrics — for example, communicating treatment summaries, screening for depression and documenting plans for pain relief — are all clearly designed for primary care and inpatient services. Rather, quality metrics that cancer patients and oncologists both agree are meaningful should be used, such as patient reported side effects, cancer outcomes and patient satisfaction surveys. These are more difficult to track, but the question stands: If we are not technologically prepared to track the outcomes that truly matter to define value of care, should we be implementing such a far reaching and mandatory APM?

Finally, and importantly, the RO-APM base rates must account for the increased complexities of novel treatments. Innovation does not happen overnight and proton therapy offers clear dosimetric advantages and potential decreases in toxicity, yet currently there is no adjustment factor to account for this. The same logic can be applied to advanced image guidance, which is significantly more complex to implement, yet receives the same reimbursement as a plan without any image guidance. These technologies are used by a fraction of practices and as a result were not appropriately considered when base rates were calculated. If they are to be included, an adjustment factor should be used for these cases.

The radiation oncology community must continue to advocate for itself and our patients to generate a sustainable payment methodology. It is paramount that this model both improves access to quality care and respects the complexity of RT planning and treatment. Further cooperation between CMMI and the radiation oncology community will be required to ensure such a model is ultimately created.

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Continued from **VARIATION IN REIMBURSEMENT STRUCTURE WORLDWIDE**

shorter and less burdensome fractionation regimens to our patients. Reimbursement systems unluckily limp behind this technological and clinical development, hampering the implementation of novel, evidence-based radiation therapy advances. The key for this impasse is to adjust reimbursement systems. Innovative reimbursement systems that consider the constant development of radiation therapy tools and properly cover for the cost of evidence-based treatments, therefore supporting sustainable access, have never been more vital.

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Action at a Distance – Reimbursement Implications

BY GERALD WHITE, MS

IN THE PHYSICS WORLD, the term "action at a distance" is well known, and an appreciation of it is crucial when describing and using a variety of physical phenomena. Magnetism, gravity and an assortment of atomic level forces can all provide action without what we might generally describe as physical contact. In contrast, the medical endeavor is not an "action at a distance" activity, but rather requires proximate contact between physician and patient. The activity of the medical physicist in radiation oncology straddles these two worlds (and here, I stretch the analogy a bit), working hands-on with patients (brachytherapy, stereotactic treatments, radiopharmaceutical therapy) but also at a distance (image fusion, delivery plan creation and analysis, system calibration, beam modeling, Monte Carlo tweaking, and AI data set training are only a few examples). I like to think that radiation oncology is unique in this regard. The healing reach of the radiation oncologist is inseparably intertwined with a complex physics process that uses particles accelerated to nearly the speed of light and a dizzying array of mechanical and computer techniques to disrupt the reproduction of cancer cells.

The specialty is embedded within the larger house of medicine, and, as we consider reimbursement mechanisms, we find that the fit between our process of care (at least on the technical side) and current constructs for valuation of and payment for services is not good. I have heard our situation described using the "round hole – square peg" analogy, but in fact the reality is even more discordant, perhaps more like putting the hammer, rather than the peg, through the round hole. The payment system for non-hospital radiation oncology services is anchored by the Resource Based Relative Value Scale (RBRVS).[1] The system was originally focused on surgical processes and, while now extended to all medical specialties, remains oriented toward those procedural specialties. Central to the valuation/payment process is the model of a "procedure" in which the physician acts on the patient for a defined amount of time, with associated non-physician expenses linked (sometimes minute by minute) with the physician work. This model fails in radiation oncology for physics intensive services, as the work of the medical physicist may not be linked directly to physician work time/effort and the associated practice expense (for example, linear accelerators, the most expensive item on the CMS equipment list). Attempts are made to develop valuation, and hence payment, for procedures not directly linked to physician procedure time, but the process stretches reality for many radiation oncology applications.

Some of the medical physics work that accrues to the benefit of an individual patient can be described by including the work in a CPT described procedure, but a growing amount of this essential work is not directly attributable to that patient, causing a fundamental disconnect with the "procedure" based valuation system. The CPT description system is a poor match to today's radiation oncology techniques. We face constant battles with payers regarding the use of IMRT, stereotactic techniques, brachytherapy and the legion of constituent procedure codes that describe portions of the overall process. This mismatch will only become worse as the technical complexity of radiation oncology diverges from the patterns of other specialties and becomes incomprehensible to the keepers of the CPT/RUC/CMS categorization processes. Many of these codes were created years ago and survive today only after hammering their definitions and descriptions of use from the original shapes into something that resembles current practice. Both the offset and slope of the mismatch graph will increase sharply as the contributions of the physicist become more complex, more integrated across patient groups and treatments and more removed from direct links to patient specific CPT described physician work procedures. A change is required for the entire technical reimbursement scheme, the current reliance on RBRVS methods cannot cope with our

rapidly developing and complex applications of technology. And here, I also include the HOPPS, also based on CPT code payments but with a different valuation methodology.

To properly recognize the technical expense of the radiation oncology endeavor and avoid constraints generated by hyper-granular task descriptions, reimbursement will need to be unlinked from physician specific procedures based on particular CPT codes and restructured to recognize the integrated role of the medical physicist (and the overall technical effort) in radiation oncology. Some suggestions to make this happen:

- Eschew the CPT code-based payment system for our technical reimbursement. Establish a baseline reference level for the cost of delivering a course of radiation therapy. Instead of relying on historical payment data, which we know is flawed, an analysis of the actual costs of delivering the radiation therapy service (a renewed Harvard style effort) should be undertaken. Rather than beginning with a granular piecework tabulation of costs, the project should determine the average cost of treating a patient for a radiation oncology course across a well sized sample of high-quality radiation centers. This would capture the baseline costs of the medical physics endeavor and include all non-physician costs and provide a firm foundation for complexity adjustments, either up or down from the average.
- Create diagnosis related complexity adjustments based on increments up or down from the average cost per patient.
- Create peer-review based quality systems using professional society accrediting programs (e.g., APEx, IROC) as a foundation to guard against practitioners invoking inappropriate pathways of care or inadequate technical processes.

CMS has proposed the RO-APM, with payment based on an episode of treatment for a particular cancer diagnosis. This moves us somewhat in the direction that will be necessary but is fundamentally different from the system I propose above. The model's reliance on historical CPT code usage and individual practice historical patterns will carry over fundamental defects into the new system. The RO-APM is still based on historical CPT code valuations for procedures and includes an unnecessary Byzantine level of complexity using carrot and stick rebates/penalties and invokes quality reporting measures that are trivial compared to serious peer-based systems.

It is time for a remake of our payment process for technical work and expense. We and our patients deserve a system that does not require clinical care pathways to be compromised by a "flea market" type piece-by-piece review and haggling negotiation for each constituent part of our work.

Gerald White, MS, is a medical physicist at Colorado Associates in Colorado Springs and a past-chair of the ASTRO Code Development and Valuation subcommittee. He has been active in the ASTRO, AAPM and ACR economics effort for several decades.

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Continued from **CHAIR'S UPDATE**

to provide recommendations to leadership (see details on page 7).

As mentioned in my 2021 ASTRO Presidential Address, there is motivation to engage early career radiation oncologists and physicists. A diverse group of (mostly) early career radiation oncologists and physicists, presently led by Dr. Austin Sim, chair of ARRO, will prepare a report for the Board in June on this important initiative. ASTRO is proud to be an official co-sponsor of the Radiation Oncology Education Collaborative Study Group (ROECSG), that hosts symposia focusing on education in radiation oncology, which is growing in popularity, especially among early career radiation oncologists. Abstracts from this meeting will be published in the Red Journal. And, new this year, the Board has approved two annual ASTRO Mentorship Awards, so please submit your nominations.

BY DAVID A. L. MORGAN, MB, CHB, ON BEHALF OF THE ASTRO HISTORY COMMITTEE (CHAIR: NAOMI R. SCHECHTER, MD)

Giants of Radiation Oncology: Biographical sketches from the ASTRO History Committee

James Ralston Kennedy "RP" Paterson, PhD (1897-1981)

Always an enthusiastic educator, Paterson ran a daily teaching session called the "Noon Clinic." One of the morning's new patients would be examined by a trainee who was then asked to outline a management plan, which was then questioned by Paterson and the audience. This picture, circa early 1950s, shows Paterson chairing a Noon Clinic. Image courtesy of Nicola Russell, MD.

IN THE PRESENT TIME, most radiation oncologists will be familiar with the name Ralston Paterson mainly as the joint creator of the Paterson-Parker Rules for brachytherapy calculations, but Paterson deserves wider recognition for his astonishingly far-sighted thinking about other aspects of radiation therapy and cancer medicine generally. A detailed biography has previously appeared in the Red Journal, written by Juan del Regato in 1987, and from this, only a few details need repeating here. The aim of this current "mini-bio" is to emphasize how Paterson foresaw much that only later gained general acceptance.[1,2,3]

Known affectionately as "RP," Ralston Paterson was a Scot, born in Edinburgh in 1897. After an international training in radiology, he was appointed director of the Holt Radium Institute in Manchester in 1931, a post he held until his retirement in 1962. His clarity of thought gave him both immense organizational skills and scientific rigor. The Holt Radium Institute was, unofficially at first, linked to The Christie Hospital, and the name "The Christie" rose to international prominence under Paterson's leadership. The "Manchester School" developed a distinctive philosophy of therapeutic practice, described in his 1948 textbook "The Treatment of Malignant Disease by Radiotherapy." A second edition of this, written after the widespread adoption of megavoltage techniques, appeared in 1963.

Some of the important elements of Paterson's techniques stood in stark contrast to those used by other "schools." Controversy between the "Manchester School" and the followers of Gilbert Fletcher was often intense, even at times acrimonious. Paterson described treatments with multiple fields applied from various angles, using the "pin-and-arc" method of beam direction. Nearly all radical treatments were given over a maximum period of three weeks, using larger doses per fraction, but smaller overall doses to much smaller volumes than used in the "parallel-opposed, 2 Gy per fraction, more prolonged courses advocated by Fletcher.

As the twentieth century progressed, and after Paterson's retirement in 1962, while the influence of his "Manchester School" remained strong in many British centers, and elsewhere, most notably Toronto, it was the "parallel-opposed, 2 Gy per fraction" schedules that came to be more widely regarded as "conventional" internationally. Now, in the third decade of the twenty-first century, the pendulum is swinging back, and treatment with fractions larger than 2 Gy, and using multiple, relatively small fields — all as advocated by Paterson — is increasingly used. Of particular note, the emergence of hypofractionated breast treatments is rapidly becoming accepted as the international "norm." Both of the major collaborative trials that provided the evidence base for this change used an "experimental" (hypofractionation) arm of 15 or 16 fractions, as Paterson had proposed decades earlier (and had indeed continued to be "standard" rather than "experimental" in Manchester, Toronto and many other places). Paterson could rightly be regarded as the "father of modern hypofractionation schedules!"

Paterson's systems of record keeping and reporting were also ahead of his time, with reports of all patients treated at the Christie, including survival rates, published annually from 1931 onwards.

But one of his most outstanding, yet sadly under-appreciated, contributions to oncology overall was his pioneering clinical trial work. In the late 1940s, he instigated the very first randomized clinical trial

in the whole of international cancer medicine. Use of an x-ray induced artificial menopause in younger women with breast cancer had been widely practiced, but it was at Paterson's suggestion (perhaps a more forceful word might be used) that the Christie radiotherapy department decided to offer it on a randomized basis to eligible patients. A second trial, where patients were randomly allocated to receive or not receive post-mastectomy radiation therapy, was initiated soon afterwards.

Lastly, he would surely be gratified to know that his granddaughter, Nicola Russell, has followed in his footsteps, and is a radiation oncologist at the Netherlands Cancer Institute, Amsterdam, with a keen and active role in clinical trials.

From the ABR

BY PAUL E. WALLNER, DO, FASTRO, AND DAVID LASZAKOVITS, MBA

Changes in the Hospice and Palliative Medicine Subspecialty Certification

IN 2006, THE AMERICAN BOARD OF MEDICAL SPECIALTIES (ABMS) approved the proposal forwarded by 10 co-sponsoring ABMS Member Boards (MBs) to create a fellowship leading to subspecialty certification in Hospice and Palliative Medicine (HPM). The American Board of Radiology (ABR) was one of those initial co-sponsoring MBs. Each co-sponsoring MB was directly involved in developing fellowship requirements and policies, creating exams, awarding certificates and assessing maintenance of certification, but exam administration was managed by the American Board of Internal Medicine (ABIM), acting for the sponsoring MBs. The first subspecialty certification exam was administered in 2008. Candidates for the certificate applied directly to the MB that had awarded their primary certification. From 2008 through 2012, ABR diplomates interested in pursuing the HPM certificate were able to apply based on practice experience, but after 2012, a one-year fellowship was required for eligibility.[1,2]

From its inception, the HPM subspecialty certification exam was administered bi-annually. From 2008 through 2022, the ABR awarded 64 HPM certificates: 56 to radiation oncologists, four to diagnostic radiologists and four to interventional radiologists. Fifty-six of the certificates were awarded between 2008 and 2012 (87.5%), but since 2014, only eight certificates have been awarded. There are currently four fellowship programs approved by the Accreditation Council for Graduate Medical Education (ACGME) Radiation Oncology Review Committee (RO RC), but none of the program directors are radiation oncologists.[3]

The ABR has reviewed the declining interest of its diplomates in HPM certification and considered the resources necessary to continue to serve as a co-sponsoring MB. Because of this decline, the ABR has elected to change its status from a co-sponsoring to a qualifying board. Diplomates of qualifying boards remain eligible to take the HPM fellowship and to receive the subspecialty certification, but effective December 1, 2021, the initial certification exam will be administered by the ABIM, which will award the certificate and be responsible for continuing certification requirements. FAQs to assist diplomates with queries related to the administration revisions have been made available on the ABR website.[4]

View references for this article at www.astro.org/Spring22News.

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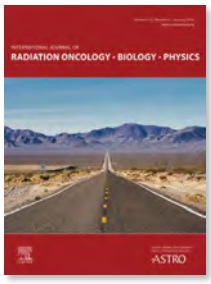
Source: 1. https://www.cancernetwork.com/view/radiation-dermatitis-recognition-prevention-and-management. 2. Singh M, Alavi A, Wong R, Akita S. Radiodermatitis: a review of our current understanding. Am J Clin Dermatol. 2016;17:277-92.The material contained is for reference purposes only.

JOURNALS HIGHLIGHTS



HIGHLIGHTS FROM *INTERNATIONAL JOURNAL OF RADIATION ONCOLOGY • BIOLOGY • PHYSICS*

January 1, 2022

A Story of Hypofractionation and the Table on the Wall

Robert Timmerman, MD

In the debut of a new feature section, Dr. Timmerman recounts how he typed out tables of dose-volume constraints, arranged by the number of stereotactic fractions given, while watching favorite television shows after work. These tables, to become affectionately known as the "Timmerman tables," now paper the walls of dosimetry workrooms around the world. As a bonus, we are provided with the newest and most complete version of these tables.

February 1, 2022

Parotid Gland Stem Cell Sparing Radiation Therapy for Patients with Head and Neck Cancer: A Double-Blind Randomized Controlled Trial

Steenbakkers et al.

This double-blind, randomized controlled trial tested whether parotid stem cell sparing would preserve parotid gland function better than standard parotid sparing technique. One hundred two head and neck cancer patients were randomized with the endpoint being >75% reduction in parotid gland saliva production at 12 months as compared to pre-treatment. Only one patient in the stem cell sparing arm and two patients in the standard arm experienced this endpoint. However, on multivariable analysis, the mean contralateral stem cell region dose was the strongest dosimetric predictor for moderate to severe patient-reported daytime xerostomia and grade ≥2 physician-rated xerostomia, indicating some potential effect.

March 1, 2022

Geographic Access to Radiation Therapy Facilities in the United States

Maroongroge et al.

This study collected data from state regulatory agencies and the Imaging and Radiation Oncology Core and the Radiation Dosimetry Services groups at MD Anderson Cancer Center, for the purpose of identifying all U.S. facilities with linear accelerators treating humans in 2018-2020. This was compared to a similar older dataset from 2005. The authors found a 16.4% increase in the number of U.S. RT facilities from 2005 to 2020. In 2020, 77.9% of the U.S. population was living within 12.5 miles of an RT facility, but 1.8% of the U.S. population had limited geographic access living more than 50 miles from an RT facility.

These articles represent a sampling of content from Dr. Yom's Issue Highlights, printed at the beginning of each Red Journal. For additional highlights, please visit www.redjournal.org/issues.

HIGHLIGHTS FROM *PRACTICAL RADIATION ONCOLOGY*

January/February 2022

Long-term Follow-up of Short-course Androgen Deprivation, Long-term Effects of Regional Nodal Irradiation, the Benefits of Pelvic IMRT, and Single-fraction SBRT for Lung Oligometastases

Dulaney and Dover

In this edition of PROshot, Drs. Dulaney and Dover review four practice pearls from four different disease sites: prostate, breast and gynecologic cancers, and metastases broadly. They explore short-term ADT and the risk of recurrence and mortality in prostate cancer patients; regional nodal irradiation and the risk of long-term mortality from breast cancer; GI toxic effects for IMRT compared to 3-D conformal RT in the treatment of cervical cancer; and single-fraction SBRT for up to three noncentral lung metastases.

External Beam Radiation Therapy for Primary Liver Cancers: An ASTRO Clinical Practice Guideline

Apisarnthanarax et al.

Strong recommendations are made for using EBRT as a potential first-line treatment in patients with liver-confined HCC who are not candidates for curative therapy, as consolidative therapy after incomplete response to liver-directed therapies, and as a salvage option for local recurrences. The guideline conditionally recommends EBRT for patients with liver-confined multifocal or unresectable HCC or those with macrovascular invasion, sequenced with systemic or catheter-based therapies. Palliative EBRT is conditionally recommended for symptomatic primary HCC and/or macrovascular tumor thrombi. EBRT is conditionally recommended as a bridge to transplant or before surgery in carefully selected patients. For patients with unresectable IHC, consolidative EBRT with or without chemotherapy should be considered, typically after systemic therapy. Adjuvant EBRT is conditionally recommended for resected IHC with high-risk features. Selection of dose-fractionation regimen and technique should be based on disease extent, disease location, underlying liver function and available technologies.

Be sure to check out the **ASTRO Journals podcasts** for issue highlights, in-depth discussion of published articles and conversations about the field of radiation oncology. Episodes are available on most major podcast platforms, including iTunes and apps in the Google Play Store, as well as on each journal's webpage under the "Collections" tab.

HIGHLIGHTS FROM *ADVANCES IN RADIATION ONCOLOGY*

A Phase 2 Trial Combining Pembrolizumab and Palliative Radiation Therapy in Gastroesophageal Cancer to Augment Abscopal Immune Responses

Chao et al.

Pembrolizumab, a PD-1 inhibitor, has demonstrated durable clinical activity in a small number of gastroesophageal cancers. The study evaluated whether the combination of palliative radiation therapy with pembrolizumab can augment antitumor immune responses in gastroesophageal cancer. The authors conducted a single-center, nonrandomized, phase 2 trial in adult patients with gastroesophageal junction, metastatic gastric, or esophageal either squamous cell or adenocarcinoma. Fourteen patients were enrolled in the study. Results showed that the combination of pembrolizumab and palliative radiation therapy offers long-lasting results; however, abscopal biologic changes were inconclusive. Future studies should focus on other biomarker analyses to further understand the putative mechanisms and identify patients who would benefit from that approach.

Rapid and Durable Symptom Palliation with Quad Shot Radiation Therapy to Nonosseous Metastatic/Recurrent Cancer in Elderly or Frail Patients in a Rural Community Clinic

Whoon Jong Kil, MD

Palliative radiation therapy is used to manage the symptoms of advanced and metastatic cancer. While a similar palliative regimen has been used in osseous and nonosseous metastatic/recurrent sites, research is lacking on the effectiveness of palliative radiotherapy in reducing pain. Additionally, nonosseous metastatic/recurrent cancer symptoms can vary from osseous cancer, including local pain, mechanical obstruction, uncontrolled bleeding and infection or pressure at the affected sites. The authors reported on the palliative symptom response and objective tumor response after quad shot among 12 elderly or frail patients with nonosseous metastatic/recurrent cancers in various sites and varying histology who were treated between 2018 to 2021. All patients experienced a 100% decrease in subjective palliative symptoms two to three weeks after quad shot 1 (QS1). Overall, the treatment showed low toxicity, with no patient experiencing a grade 3 or above.

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ASTRO'S 64th Annual Meeting is the premier radiation oncology scientific event in the world and attracts more than 11,000 attendees each year. The 2022 ASTRO Annual Meeting — Artificial Intelligence and Emotional Intelligence: Caring for the Patient in a Wireless World — will include a full program with engaging educational and scientific sessions, live SA-CME courses and networking events. We are excited to continue several popular offerings from past years — such as the Cancer Breakthroughs session and Storytelling — as well as deeper dives into important topics with our Master Class series. As you mark your calendar, please note that the meeting will end early this year at 1:45 p.m. CT on Wednesday, October 26.

Registration and housing for the Annual Meeting will open in mid-June.

We look forward to seeing you in San Antonio!

astro.org/annualmeeting