Measuring **Quality Healthcare** in Radiation Oncology

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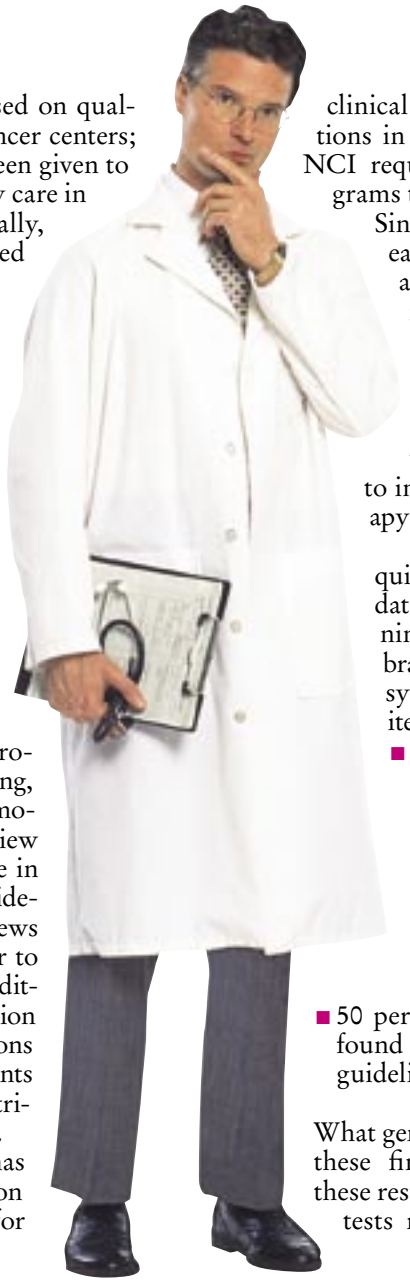

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Much attention has been focused on quality of care in community cancer centers; however, less attention has been given to defining and ensuring quality care in radiation oncology. Generally, quality care in radiation oncology is measured using six criteria:

1. High patient satisfaction scores
2. Low treatment-error rates
3. Accreditation status
4. Compliance with the American Association of Physicists in Medicine (AAPM) Task Group report TG-40 and TG-53 recommendations
5. Physician and employee satisfaction
6. Equipment functionality and the associated amount of downtime.

Quality Care in Radiation Oncology

Quality of care has different meanings for different groups. For example, patients define quality care in terms of outcomes (tumor management), symptom control, treatment-process education, staff responsiveness, scheduling, and environment (clean, quiet, soothing atmosphere, etc.). Clinicians, on the other hand, view quality care in terms of the processes that are in place to assist with quality assurance (QA) guidelines. These processes consist of chart/reviews and rounds, chart audits, physics checks prior to treatment, and physician peer review. Accrediting organizations, such as the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), require chart audits to ensure patients are receiving supportive care (social work, nutrition) and to document other quality initiatives.

The National Cancer Institute (NCI) has strict quality of care requirements for radiation oncology departments that receive funding for clinical trials—approximately 1,300 institutions in North America and internationally. NCI requires these radiation oncology programs to participate in independent reviews. Since it is not possible to physically visit each site on a routine basis, these reviews are carried out using several different methods, including onsite reviews, retrospective patient chart evaluations, and comparison of dosimetry data. The cancer programs use the results of these independent reviews to develop recommendations on ways to improve the quality of their radiotherapy treatments.

Among other criteria, the NCI requirements include a review of dosimetry data for photon and electron beams, planning systems for external beam treatment, brachytherapy sources, and planning systems. A report on the institutions visited during 2001-2003 found:[1]

- More than 97 percent of the institutions received one or more recommendations for improvement, with an average of four recommendations per site.
- 82 percent of the institutions were found to be *not* in compliance with AAPM TG-40 quality assurance guidelines.
- 50 percent of the radiation programs were found deficient in the 2 percent tolerance guidelines for wedge transmission.

What general observations can be drawn from these findings? Perhaps most importantly, these results show that the comprehensive QA tests recommended by TG-40 are neces-

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sary—even in states that have no regulations regarding accelerators. However, if the results of these TG-40 QA tests are not compared to current clinical values (e.g., current output data from the linear accelerators), they are rendered essentially useless.

These findings also raise a more troubling question. If these results reflect only those radiation oncology programs receiving NCI funding, what steps are being taken to ensure that quality treatment is being delivered in the remainder of the radiation oncology departments across the United States?

QA Demographics Survey

At TMA Technology Ltd., we perform onsite, third-party, independent reviews on beam output data and other dosimetric parameters in radiation oncology departments. In our recent QA Demographics Survey, which was distributed to approximately 425 members of the Society for Radiation Oncology Administrators (SROA), we looked at some of the "hot" issues and procedures in radiation oncology departments. Fifty-six radiation departments returned the survey—a 13 percent response rate. Of these, 73 percent were hospital-based programs and 27 percent were freestanding radiation facilities.

Here's what they said:

- 41 percent of the departments are accredited with either the American College of Radiology (ACR) or American College of Radiation Oncology (ACRO).
- 80 percent conduct physician peer review meetings. Issues such as high-risk/low-volume procedures, unplanned treatment breaks (48 percent), mortality (41 percent), and recurrences either adjacent to or within previously irradiated fields (31 percent) are reviewed at these meetings.
- 93 percent of the managers reported knowing what constitutes a state reportable event.
- 83 percent had conducted a root-cause analysis for a state reportable event.
- Only 50 percent of the managers knew the AAPM TG-40 guidelines, and only 32 percent tracked compliance with the TG-40 recommendations.

Survey respondents also reported on the quality indicators tracked by their radiation programs. These included:

- Patient satisfaction (95 percent)
- Treatment misadministration (80 percent)
- Physics checks prior to third treatment (73 percent)
- Number of simulations and starts (48 percent)
- Patient waiting time (36 percent)
- Consistency between what is written in the chart and what is entered into the Record and Verify (R/V) system (30 percent)
- Port film repeat rate (30 percent)
- Machine overrides (29 percent)
- Block re-cut rate (7 percent).

Full QA Demographics Survey results can be found on TMA's website (*www.TMATech.com*).

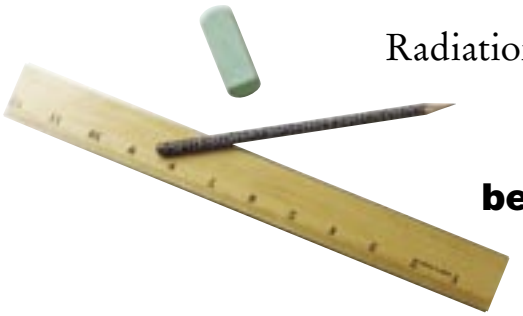
According to our survey, 85 percent of radiation departments use Continuous Quality Improvement (CQI) methodology within their departments and 50 percent use CQI methodology cross-departmentally to improve processes for ensuring delivery of a quality service. Today FOCUS-PDCA is the most popular CQI methodology being used by the healthcare industry. Another methodology that is migrating into healthcare is Six Sigma. Early adopters of Six Sigma are having success reducing costs, improving patient safety, and increasing patient and staff satisfaction ratings.

Of particular interest to radiation oncology is the Failure Mode and Effectives Analysis (FMEA), a tool that is embedded in Six Sigma to identify and prevent errors from occurring. Recommended by JCAHO, this tool is useful when implementing new technology. The explosion of newer and more complex technology within radiation oncology is rampant. Many cancer programs are faced with implementing new services in a rather short time frame (see box on this page). FMEA can help radiation departments identify what could possibly go wrong *before* implementation—allowing them the opportunity to correct errors before the first patient is treated.

New Technology *and a Shrinking Workforce*

The field of radiation oncology has seen the emergence of new technologies such as intensity modulated radiation therapy (IMRT), image-guided radiation therapy (IGRT), MammoSite, and TomoTherapy. In fact, new technologies are being introduced so fast, that the AAPM has not had time to standardize and make final recommendations via an official Task Group report for the QA processes of many new procedures. Additionally, these new technologies are very labor intensive—adding additional processes onto an already large workload for many radiation oncology departments. Compounding the issue is the fact that many radiation programs are currently experiencing staffing shortages.

ASTRO recently surveyed its members and found that practices have a staffing vacancy rate of 18 percent. This number translates into an additional 1,800 radiation therapists needed in the workforce. A significant majority of survey respondents indicated that this staffing shortage impacted the quality of patient care being delivered in their respective departments. While recruitment efforts have increased the number of radiation therapists in the workforce, workers continue to move out of the field into management positions, to retire, and/or to leave for other fields. The bottom line: the adoption of new technologies requires more skilled man-hours.



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Radiation departments that can provide **QA data** will be ahead of the game **and may potentially benefit** from higher reimbursement rates.

Why QA Matters

Large purchasers of healthcare (employers) want to ensure that their employee health benefits are provided by clinicians who provide quality service and have the data to back it up. Insurance payers are also looking to contract with evidence-based providers—ones with the patient volume and a quality track record. Radiation departments that can provide QA data will be ahead of the game and may potentially benefit from higher reimbursement rates.

Still, tracking an institution's patient outcomes within its radiation oncology department can be a daunting task. For a variety of reasons—physician preference, patients moving out of a geographical area, or insurance-driven decisions—patients oftentimes are not followed for as long a time period as in the past. An additional problem: within the cancer registry, radiation oncology fields are no longer required fields. At best, delivered dosages can be obtained. In most cases, little information regarding complication rates (short- or long-term) is available. Doing retrospective studies is time consuming, and most non-academic facilities do not have the staff to support such endeavors. Whatever the barriers, the radiation oncology field *must* make QA data collection a priority as our healthcare system moves towards evidence-based outcomes.

We Have the Technology…

Several tools are available to assist radiation oncology managers in tracking QA issues. IMPAC and VARiS are two of the most widely-used integrated data and image management software programs. Both programs have extensive reports that provide information on:

- Demographics (zip code, gender)
- Revenue enhancement (payment, authorizations, co-payments, and costs)
- Patient statistics (new/old, curative/palliative, referring doctor)
- Scheduling (equipment utilization, productivity)
- Treatment information (site-specific treatment plans, variances, overrides, dosage).

Another tool is the Radiation Oncology Performance Enhancement (ROPE) Database, which was developed by TMA Technology to complement IMPAC and VARiS. This program helps oncology managers track quality indicators, benchmark departmental processes, and print reports for internal use as well as for accreditation. ROPE also educates staff about JCAHO, ACR, and ACRO standards by linking departmental processes to relevant advisory material.

Here's how ROPE works. The program tracks the operational processes involved in patient quality assurance, equipment quality care and personnel education, productivity, and licensure/certification renewals. The information is processed by an online application service provider and can be accessed through any workstation, laptop, or PDA with Internet access. Much of the information in the database is related to standards recommended by JCAHO, ACR, and ACRO. The section on linear accelerator, simulator, and treatment planning system equipment is based on recommendations by the various AAPM task groups.

The ROPE database interfaces with IMPAC and VARiS so that users can generate real-time reports that can be used during the survey process for accreditation, federal and state inspections, and benchmarking efforts. Oncology staff can also use these reports to implement "best practices" for quality improvement. The ROPE database works with the Web portal, *www.tmatech.com*, to provide quick access to over 200 documents, which can be downloaded and customized for any radiation department, as well as a library of over 650 industry-related links and the latest news in radiation oncology.

Data are king. To effect change, your radiation program must have hard data and not go on intuition alone. Remember, *you cannot manage what you do not measure.*

QA is Here to Stay

By their very nature, radiation oncology procedures are complex. This complexity makes it vital for staff (physicists, dosimetrists, therapists) to be well prepared and to record procedures in an accurate and timely fashion. Patients should not be "rushed" into treatment with a newer technology either due to physician insistence or because of financial incentives due to better reimbursement. Treatment and QA policy and procedures should be in place *prior* to application of a new technology. Moreover, patient education should precede treatment.

Tools and resources are available for efficient QA data collection and tracking. Further, adoption of resources to streamline and improve quality assurance issues will maximize efficiency and improve performance in our radiation departments. With the growing consumer emphasis on quality healthcare, these procedures are likely to become required for treatment and licensing.

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References

[1]Followill D, Lowenstein J, Ibbott G. Quality Assurance: It's here to stay. *AAPM Newsletter.* January/February, 2003.