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Title

The Director of Prostate Imaging: advancing care for prostate cancer patients

Permalink

<https://escholarship.org/uc/item/6vx607k9>

Journal

Abdominal Radiology, 42(9)

ISSN

2366-004X

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Publication Date

2017-09-01

DOI

10.1007/s00261-017-1132-5

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Peer reviewed

The Director of Prostate Imaging: Advancing Care for Prostate Cancer Patients

Manuscript type: Perspective

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Disclosures of Interest:

ACW - Scientific advisory board member for 3D Biopsy, LLC
ABR - Royalties, Thieme Medical Publishers

Abstract

The radiologist's role extends far beyond interpretation and reporting of medical imaging. In this manuscript, we describe the role of the Director of Prostate Imaging. We believe this model can and should be implemented at other institutions, ultimately serving to improve the care for prostate cancer patients. Moreover, this model can be translated to support the development of an array of patient-centered service lines not only in abdominal imaging, but throughout radiology practices at large.

Introduction

The radiologist's role extends far beyond interpretation and reporting of medical imaging. Radiologists are physicians who advocate for the well-being of their patients as individuals and as populations who suffer from a given condition. To this end, one avenue for radiology practices to improve the quality of care for patients and referring physicians is to foster specific service lines, engaging a champion in the practice to optimize the delivery of care within the particular area. Whether this service line relates to a modality such as ultrasound, an organ or body region such as prostate or pelvic floor, or even a comprehensive integrated system such as a women's imaging or thyroid biopsy clinic, the director of such a program focuses attention on the specific subject, seeking enriched experience and expertise, and continually perusing improvements in the delivery of care. While this article explores one example in detail (namely, the Director of Prostate Imaging), the lessons learned from this role could be applied improve care delivery in a wide variety of other service lines. In this regard, while consideration of the Director of Prostate Imaging is valuable in itself, it moreover provides a salient example of the benefits of developing service line leadership in a radiology practice or department.

The authors of this article are all abdominal radiologists at large university medical centers that, in addition to their academic titles, also hold a formal designation that recognizes their leadership in the field of prostate imaging within their institutions. The pathway to this recognition varied from case to case. One author developed a new program in close partnership with an analogous local champion within the Urology department; one was recruited with the specific goal of building a prostate imaging program after gaining considerable experience in the area at an earlier institution; while one further grew and reshaped a previously existing program. A concerted direction and vision, along with departmental and institutional support and buy-in, served as a key commonality for developing the requisite expertise in the area.

Herein we describe the attributes of these positions in prostate imaging and the relevant roles the authors play in their institutions. This is a model that, in our opinion, is valuable for improving patient care, and could be implemented at other sites. While the exact names of the positions vary (e.g. Director of Prostate Imaging, Director of Prostate MR Imaging, and Director of Clinical Prostate MR Imaging Program), in this article we will use the term Director of Prostate Imaging throughout.

- Urologist and other referring physician engagement

The Director of Prostate Imaging is the physician point-person and department's liaison to other specialties, in particular urologists. In this realm, the responsibilities vary from site to site, but are typically focused on improving clinical care through high quality imaging and communication. Among the many activities are shared planning of institutional policies and pathways for imaging men with suspected or biopsy-proven prostate cancer; joint development of distinct protocols for different patient populations,

e.g. pre-treatment versus post-treatment protocols; joint development of report templates that address the local clinical needs; informal review and formal case discussions in conferences and tumor boards; evaluation of outside imaging examinations for quality and potential use in patient management; discussion of new imaging applications; and troubleshooting individual cases as necessary. An embedded radiology reading room in the urology clinic can serve as a powerful way of achieving the integration of radiology and urology [1]. Technology-assisted remote collaboration, for example using live video and screen-sharing, serves as an alternative approach [2].

- Biopsy and focal therapy program

The increasing recognition of MR imaging as a tool that is able to reliably identify and characterize prostate cancer has led to an increase in its use to guide procedures, in particular transrectal ultrasound guided-biopsies. While these procedures were initially performed using a cognitive approach, (i.e. visual co-registration based on landmarks identified by both imaging modalities), current systems allow for the fusion of previously obtained MR images and real-time ultrasound. The process, though, requires active participation of the radiologist who must segment the prostate (i.e., outline its contour) and identify potential targets (i.e., mark on the images the suspicious sites that should be sampled by the urologist). It is usually the Director of Prostate Imaging who performs these tasks or supervises and coordinates them. In some instances, the Director of Prostate Imaging may also personally perform the biopsies. Finally, the Director of Prostate Imaging can collaborate with the urology department when first initiating a fusion biopsy program, for example providing input regarding the selection from among a range of commercial available platforms. This consensus decision is valuable given that both departments stand to be highly impacted by the new workflow. The visibility this

position affords means that the Director of Prostate Imaging may also be sought by community physicians interested in establishing a referral system for prostate MRI and segmentation prior to targeted biopsy performed by the outside referrer, if not for imaging and targeted biopsy all performed by radiology, potentially involving in-bore MRI-guided biopsy.

More recently, this same process is being considered for focal ablations of prostate cancer using laser, high-intensity focused ultrasound, cryosurgery, or irreversible electroporation. While this is still a very new application that has been performed in a limited number of centers, it stands to become more common in the near future. These procedures can be performed using the same US/MRI fusion technology mentioned above or, depending on the technique, inside the bore of the MR system. In either case, the urologist or the radiologist may perform the procedure, or even perform it jointly. As a burgeoning research area, a dedicated radiologist who can balance and adjust imaging and interpretation parameters to meet this new challenge is paramount.

- Radiologist engagement

As with other imaging tests, consistent interpretation and reporting of results is critical for impacting the clinical value of prostate MRI. The PI-RADS v2 guidelines were developed to address this issue [3]. Nonetheless, studies show moderate inter-reader variability of PI-RADS v2 [4,5]. It is thus important to have systems in place to attempt to minimize the problem. Two main methods are typically utilized: continued assessments and training, and use of report templates. It is usually the responsibility of the Director of Prostate Imaging to organize baseline and continued training for radiology colleagues who interpret prostate MRI based on ongoing assessment of radiological-pathological correlation and feedback from clinicians. This may require routinely assessing the

presence and extent of interpretation variability among colleagues and addressing these with additional formal training, radiologic-pathologic correlation conferences, and informal case-based consultations. The Director of Prostate Imaging is expected to function as the local expert in the department, answering specific and general questions from colleagues. Prostate imaging can be daunting for even seasoned radiologists, and although potential pitfalls are well documented, the experience that comes in leading the development of the program can be invaluable in handling challenging cases. The use of report templates is the other approach to minimize variability. The Director of Prostate Imaging may supervise the development of such reports, but the process takes into account the opinions and needs of urology and radiology colleagues. Such collaboration with referrers as well as with radiology colleagues is valuable to assure the necessary information that will guide clinical management is included in the report, as well as to guarantee the template is simple enough to be utilized without disruption of every-day work, and is accepted and used by all parties. While broad participation is encouraged, having a point-person to give structure, direction, and maintained momentum, ensures the highest likelihood of success in this process.

In addition, the Director of Prostate Imaging is responsible for teaching community radiologists and international scholars through CME courses and organized or ad-hoc visiting educational programs, along with updating local colleagues of new developments in the field. Continued participation in the major meetings and workgroups and collaborations with national and international colleagues is crucial to successfully achieve this goal.

- Trainee engagement

Imaging of prostate cancer is rapidly evolving to include not only multiparametric MRI, but also molecular imaging such as C-11 choline or PSMA PET imaging [6], which

collectively can be daunting for trainees. The Director of Prostate Imaging works alongside the directors of the residency and fellowship programs to stimulate interest and incentivize trainees to deepen their involvement in the full breadth of prostate imaging and engagement in patient care. This can be accomplished through lectures to residents and fellows within radiology, urology, and radiation oncology, case-based interpretation sessions, multidisciplinary journal clubs, research projects, and support for attending scientific meetings.

- Technologist engagement

From a technical acquisition perspective, multiparametric prostate MRI is a challenging and evolving technique. It is, thus, very important for the Director of Prostate Imaging to work closely with the technologists to ensure consistent and adequate image quality. Protocol refinements, image optimization, and the testing and introduction of new sequences all fall within the scope of this relationship. Ongoing standardization efforts by the American College of Radiology (ACR), European Society of Urologic Radiology (ESUR), and AdMeTech Foundation call for images to be acquired utilizing specific parameters [3], and it is the responsibility of the Director of Prostate Imaging to verify that the correct protocol is being utilized. The Director of Prostate Imaging should also be available to assist the technologist and determine the best course of action when, at the time of scanning, patients cannot follow standard protocols. An example is the determination to proceed and scan the patient without using intravenous contrast when a contra-indication to its use is identified by the screening protocol applied by the technologist. Lastly, in centers that use an endorectal coil, the Director of Prostate Imaging trains those involved in coil placement (whether technologists, nurses, or other radiologists), for example through in service examinations and proctoring. It must be ensured that the coil is placed not only with technical proficiency, but also in a

streamlined manner that considers the patient experience.

To enhance the relationship with the technologists, the Director of Prostate Imaging may conduct periodic question-and-answer sessions with the technologists who perform prostate MRI examinations, describing recent protocol updates, recurring artifacts, or other challenges, while fielding technologists' inquiries regarding any aspects of the protocol. The Director may also take this opportunity to provide a brief lecture to the technologists regarding clinical aspects of prostate cancer imaging. Beyond such sessions, the Director may, on occasion, directly sit with and observe the technologists as they perform clinical examinations. This experience can give the Director better insights into any practical challenges faced by the technologists, as well as provide an appreciation for the overall flow of the examination that may help guide further protocol refinements. This degree of technologist engagement is especially important when implementing protocols that place greater demands on the technologist for ensuring successful acquisition, such as to perform MR spectroscopic imaging or coil placement.

- Quality improvement

Quality assurance (QA) programs of various forms are in place in our institutions, and the Director of Prostate Imaging is either engaged as the supervisor of a smaller, more specific, quality program in prostate imaging, for example assessing adherence to reporting standardization, or as a member of a larger and more comprehensive QA team, for example seeking to improve workflow and patient satisfaction department-wide. The methods utilized vary from institution to institution, but common approaches use PDSA-like (plan–do–study–act) methods. The specific goals of each QA program will vary slightly at each institution, to address the most pressing local concerns, but all aim at improving the quality of provided service. Irrespective of the details, it is important that the Director of Prostate Imaging takes ownership of the tasks that directly impact on

prostate imaging. Another aspect of quality improvement is radiologic-pathologic correlation. The Director of Prostate Imaging may institute regular reviews, often engaging urologists and other practitioners, where imaging and pathology are reviewed for concordance. The development of a “fusion” report that synthesizes this information, requires input from departments of radiology and pathology with a champion in each, but adds value to patient care in the form of concordance reporting.

- Patient and community engagement

Personalized medicine and patient-centered care are increasingly recognized as important avenues for successful health-care. As may be expected, men with prostate cancer are often knowledgeable about their disease and seek information about it prior to management decisions. The Director of Prostate Imaging is ideally positioned to directly educate and assist patients with questions that pertain to their scans, including inquiries about the protocol, the scanning procedure, and test results, among other topics. Formal mechanisms to support such patient-physician communication include an in-person consultation service as well as a formalized process for review of scans from outside institutions. Furthermore, the Director of Prostate Imaging is available to collaborate with institutional staff to improve patient education by assisting in the development of instructional material (brochures, online content, etc). Other related activities may include open house lectures, and visits to stakeholders (e.g. referring physicians in the community, insurers, as well as patient advocates and support groups). While these efforts often start at an individual institution, partnerships with subspecialty societies and foundations can effectively broaden their reach. This education is not unidirectional – by directly engaging patients, the Director of Prostate Imaging develops a heightened understanding of community concerns and perceptions that can be applied in subsequent quality efforts.

- Research

The wealth of prostate MRI research is easily recognized by a simple search of PubMed. The span of publications in recent years extends from basic science, to clinical and translational research, to health policy. The Director of Prostate Imaging is a member of one or more multidisciplinary teams that aim to foster technical developments and improvements in acquisition and utilization of prostate MRI. This requires working with a range of scientists of various backgrounds. In basic sciences, research teams might include bioengineers, mathematicians, physicists, and computer scientists, among others. Clinical scientists typically include urologists, but also radiation and clinical oncologists, nurses, and pathologists. Collaborations are also nurtured with epidemiologists, biostatisticians, and others. Many projects occur in parallel, and often led by other non-radiology investigators. Yet, the Director of Prostate Imaging is usually an essential collaborator or co-investigator who provides a unique blend of both imaging, clinical, and technical input for the successful advancement of such projects. This requires, among other things, the organization and participation in regular research meetings, selection of the appropriate design and imaging protocols for the proposed research, interpretation of imaging data and analytic results, and writing and reviewing manuscripts and grant proposals.

- Conclusion

While many of the tasks we assign to the Director of Prostate Imaging might occur in academic departments at the behest of the business development service and without a point-person, the Director brings value to the institution by accelerating and unifying processes, increasing efficiency while overseeing quality and ensuring a global

vision for the program. With institutional support, the Director of Prostate Imaging can successfully enhance clinical care, assist educational efforts that target the broader community along with specific and invested health care providers, and serve as an effective local advocate for prostate imaging. The formal institutional recognition of a Director of Prostate Imaging helps to maintain a high-quality service line that adds value to patients and referring physicians. The Director of Prostate Imaging may have a mandate to implement programs in a manner that is more effective than in an entirely decentralized system. While decision-making is highly dependent on the hierarchical structure of the organization and local culture, the Director of Prostate MRI provides the radiology department with a stronger voice in serving as an advisor to clinical departments in establishing care pathways for patients with known or suspected prostate cancer. A consistent voice to referrers, patients, and colleagues may also facilitate the coordination of enduring multidisciplinary efforts. While the title comes with increased responsibilities, it is also a sign of appreciation that boosts morale and empowers the recognized individual. This radiologist is now accountable to meet heightened expectations and ensure the success of the institution in this particular service line. We believe this model can and should be implemented at other institutions, ultimately serving to improve the care for prostate cancer patients. Moreover, this model can be translated to support the development of an array of patient-centered service lines not only in abdominal imaging, but throughout radiology practices at large.

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