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Healthcare Reform for Imagers

Finding a Way Forward Now

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The changing healthcare environment presents many challenges to cardiovascular imagers. This perspective paper uses current trends to propose strategies that cardiovascular imagers can follow to lead in managing change and developing the imaging laboratory of the future. In the area of quality, imagers are encouraged to follow guidelines and standards, implement structured reporting and laboratory databases, adopt ongoing quality improvement programs, and use benchmarks to confirm imaging quality. In the area of access, imagers are encouraged to enhance availability of testing, focus on patient and referring physician value and satisfaction, collaboratively implement new technologies and uses of imaging, integrate health information technology in the laboratory, and work toward the appropriate inclusion of imaging in new healthcare delivery models. In the area of cost, imagers are encouraged to minimize laboratory operating expenses without compromising quality, and to take an active role in care redesign initiatives to ensure that imaging is utilized appropriately and at proper time intervals. Imagers are also encouraged to learn leadership and management skills, undertake strategic planning exercises, and build strong, collaborative teams. Although it is difficult to predict the future of cardiovascular imaging delivery, a reasonable sense of the likely direction of many changes and careful attention to the fundamentals of good health care (quality, access, and cost) can help imagers to thrive now and in the future.

Despite stunning technologic advances in imaging, it is easy to be discouraged about other fundamental changes in cardiovascular (CV) care, such as the reductions in reimbursement for office-based testing leading to widespread hospital integration, and sometimes arbitrary-seeming requirements, including imaging pre-notification and pre-authorization. When change of this magnitude and speed occurs, some may be reactive rather than looking to the future. In doing so, it is easy to see opportunity in some areas, but not so easy to be optimistic about others. For example, most will agree that adoption of the electronic health record provides a much needed platform for decision support and other tools to improve quality, including making imaging reports and the images themselves available at every point of care. In contrast, declining reimbursement makes it harder to rationalize the cost of personnel required to collect, report, and improve imaging quality metrics, such as appropriate use. A drive toward cutting costs and maximizing revenue threatens the innovation and graduate medical education that have driven imaging technologic advances and made the U.S. healthcare system the envy of the world. Reasonable questions arise: Will satisfying the ever-expanding forest of quality metrics and further reductions in reimbursement leave us any time or resources

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to actually care for our patients? And will we be labeled—publically—as a "bad doctor" if we sometimes decide that a patient's unique clinical situation demands ordering an "inappropriate" imaging test or procedure?

Identifying where the opportunities lie is perhaps the biggest challenge and yet is the key for imagers to survive and perhaps thrive in this changing healthcare environment. The recent reaffirmation of the constitutionality of the Accountable Care Act by the U.S. Supreme Court has reduced some of the uncertainty, but by no means all. Payers and government are moving us toward a very different healthcare delivery system regardless of legislation. However, although there are lots of buzzwords and demonstration projects, there is little consensus as to what the final product might look like. To counter such confusion, we propose that focusing on fundamental principles can actually provide some much needed direction and perhaps even opportunity.

A number of forward-thinking organizations have proposed broad frameworks for health care in the future. These range from the Institute of Medicine's 6 dimensions of quality (health care must be safe, effective, patient-centered, timely, efficient, and equitable) (1), to the Institute for Healthcare Improvement's triple aim (population health, individual experience of care, and cost) (2). A simple but clinically relevant construct aims for quality, access (or patient value), and reduced cost (or efficiency) as a succinct summary of the desired state. Although we do not know what form or forms healthcare delivery will take in the future, we can be sure that, ultimately, these principles or ones very similar to them will be honored.

Although each individual situation is unique, with nuances and decision points that can only be addressed locally, as a profession and a community, imagers can follow a general direction that will help us realize the future and not just mourn the past and react to the present. In this paper, we use current trends to propose strategies that the CV imager can use to lead in managing change and developing the imaging laboratory of the future (Table 1).

Quality

Many guidelines and standards have been developed by our professional societies and accrediting and certifying bodies. These represent the efforts of countless experts to define minimum standards, optimum standards, and best practices in imaging. They bring great value by providing a robust foundation for all discussions about quality, especially with administrators, policy makers, and payers. Every imaging technician and physician should become familiar with these documents and use them in their day-to-day work. A balance between the comprehensive and practical approaches is required—some of the recommended guidelines and meticulous standards may seem out of reach or unnecessary for routine studies (e.g., extensive echocardiographic quantitation of mitral regurgitation), and yet one must be able to apply them in the correct circumstances. In general, mediocre work will become less acceptable.

Guidelines tend to address image analysis and sometimes acquisition, yet there is a need for guidance across the entire range of imaging laboratory function and patient involvement. Although more than 15 years old, the continuous quality improvement (CQI) recommendations from the American Society of Echocardiography (ASE) (3) provide a step-by-step road map that covers all structural and process aspects of echocardiography laboratory quality. Other modalities have similar roadmaps (4–7). Documents such as the American College of Cardiology (ACC)–Duke Think Tank on Imaging Quality (8) and the ASE recommendations for quality echocardiography laboratory operations (9) emphasize the importance of the interfaces between the imaging laboratory and the referring physician for patient and test selection and results dissemination and incorporation into care, in addition to the more conventional image acquisition and interpretation. Documents such as these make clear that it is not enough to be a crackerjack imager; quality also includes the entire functioning of the laboratory and its service to patients and referring physicians.

Table 1. Attributes for Success for Imaging Laboratories During Healthcare Reform

Quality
1. Implement imaging guidelines and standards
2. Structured reporting
Develop databases to track quality measures and other parameters required for laboratory accreditation
3. Use quality benchmarks for ongoing quality improvement programs, including
Appropriate use
Reproducibility of measurements and report findings
Accuracy by comparison with other modalities
Timeliness of study performance, interpretation, and reporting
Radiation safety
Access and value
1. Enhanced availability—longer hours, convenient locations
2. Customer service
Track patient satisfaction
3. Collaboratively implement new technologies and uses of imaging
4. Integrate health information technology in the laboratory
Order entry
Reporting
Image access
5. Work toward the appropriate inclusion of imaging in new healthcare delivery models
Cost
1. Minimize laboratory operating expenses without compromising quality
2. Take an active role in care redesign initiatives to ensure that imaging is utilized appropriately and at proper time intervals on a diagnosis by diagnosis basis
Leadership
1. Learn leadership and management skills
2. Strategic planning
3. Build strong, collaborative teams within the laboratory, the practice, the heart center, and across the institution

When such quality standards are followed universally, important improvements in other areas of care such as reduced downstream testing, improved correct diagnosis rate, and improved health status can result.

The very complex and as yet unanswerable question of whether CV imaging alters downstream health outcomes is highly relevant, but beyond the scope of this paper. Instead, we as an imaging community must first tackle imaging/laboratory quality issues, as poorly performed imaging is unlikely to have any impact (8). Thus, we urge imagers to focus on immediately actionable and practical measures of quality while the larger issues of imaging's relationship to outcomes are still being debated (10).

Being knowledgeable about the role of imaging in new CV technologies such as transcatheter aortic valve replacement and percutaneous mitral valve repair, and acquiring new imaging techniques like 3-dimensional echocardiography or equipment that enables use of lower radiation exposures during nuclear and computed tomography procedures, are necessary but will no longer be enough to claim superior quality imaging. Achieving quality will increasingly depend on consistency and adherence to standards, which in turn requires careful implementation and tracking of operational and professional improvements. It is more incremental than mercurial.

Laboratory evaluations that equate increases in volume or productivity with "quality" are similarly doomed to be outdated. As the thoughtful imager has long argued, such measures may actually denote decreasing quality because of unrealistic productivity expectations or inadequate staffing and resources. However, making the argument that these traditional metrics should be supplanted by new ones that are more germane will take sustained advocacy supported by reliable data, as well as the development of viable alternative metrics. Although it is a long-held belief that higher quality practice will result in better health outcomes, studies are needed that examine the relationship between quality imaging practices and outcomes (10).

Although most CV imaging laboratories currently use structured reporting, it is clear that ongoing attention to health information technology, including meaningful use requirements (11), will make this a requirement for all laboratories in the near future. Discussion of the components, advantages, and importance of structured reporting can be found in the ACC/American Heart Association (AHA) Health Policy Statement on structured reporting in CV imaging (12). Further, it is now important that each imaging laboratory collect and analyze its own data for reproducibility, accuracy, and comparison with other modalities and clinical outcomes, an exercise that is immeasurably easier with reporting systems founded on a relational database platform. Imaging laboratories should ensure that their performance is not only exceptional but also well known to referring physicians, who may have a choice of imaging providers, or who may have financial incentives not to use imaging at all.

National trends toward professionalism and accountability are requiring imaging laboratories to pay closer attention to external determinations of quality. There is every indication that adherence to such metrics will increasingly be required in the future. Unfortunately, there is a range of organizations that have jurisdiction over imaging quality, such that satisfying requirements is not simple. There is no question that payer requirements for laboratory accreditation will become both more widespread and more stringent. Similarly, requirements for personnel certification and even licensure will also increase. In the future, structural measures such as these will likely not be sufficient. Imaging laboratories will have to demonstrate quality to stakeholders on an ongoing basis for both processes and outcomes. Although the precise metrics may be specific to each modality and are still undecided, it is clear those measures of appropriate utilization, safety (e.g., radiation dose), and timeliness of providing the service and reporting results will be included. Indeed, the National Quality Forum (NQF) has already approved draft performance measures related to CV stress imaging utilization and cardiac computed tomographic angiography (CTA) radiation exposure (13). (For a discussion of the types of quality metrics that may be applied to imaging technology, see the ACC/AHA Methodology for Developing Technology Quality Metrics document [14].) The drive toward increased accountability and patient-centered care has brought public reporting to the CV imaging world. Although this currently simply lists accredited laboratories and board-certified imagers, in the future, this may include statistics such as adherence to appropriate use criteria (AUC), age of equipment, average wait times for appointments, costs of imaging tests (including copays), and so forth. Finally, as our colleagues in other areas of CV medicine also respond to increasing demands for accountability and transparency, imagers need to provide whatever support is necessary to ensure that internal and external quality metrics for general cardiology care that may depend on imaging performance are satisfied. For example, when care pathways require timely determination of left ventricular ejection fraction, imagers must be responsive and supportive.

Access

In the healthcare arena, the term "access" has many meanings. For the imager, an important meaning relates to patient value, which can range from delivery of services in a timely and efficient manner to patient centeredness and patient satisfaction.

Most imaging laboratories are cognizant of the time intervals between

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study order and performance, and performance and report delivery. Access also means imaging laboratory locations convenient to both patients and referring physicians with attention to removing barriers for those with disabilities as well as supplying general amenities such as parking and convenient hours. It is essential that such access issues are tracked and minimized not only for elective outpatients but also on nights and weekends, for emergency rooms (ER) and intensive care units, and for all types of procedures. Increasing cost pressures to reduce length of stay means that hospitals will strongly seek to provide 24/7 services. Thus, laboratories may be forced to implement new technician and physician staffing models in addition to considering, in the correct circumstances, the use of directed rather than comprehensive imaging protocols.

Access also means that imaging laboratories should be ready to aid in the incorporation of new innovations into routine care; the recent publication of 2 large randomized trials demonstrating the efficiency and safety of the use of immediate cardiac CTA in low-intermediate chest pain patients means that imagers will be called upon to provide ER services in this large population (15,16). Partnerships with ER physicians or chest pain observation units and across imaging specialties (cardiology and radiology) can ensure that changing clinical needs are able to be met by imaging laboratories.

Other new technologies, such as handheld or point-of-care ultrasonography, bring different challenges. As "high end" imagers, we must acknowledge the inevitability of these advances and work to mitigate the possibility that they may "dumb down" our profession. The best option is to proactively work with the intended users to ensure adequate training, use guidelines, credentialing, and quality assurance as well as establishing in a collaborative fashion appropriate clinical use and algorithms for subsequent referral.

Access does not just mean appointment availability or responsiveness, but rather that a high level of overall service and value is provided to patients and referring physicians. Identifying customers' needs and preferences is an important first step in ensuring that their expectations are met. In particular, the move to patient-centered care is highly relevant to the imaging laboratory and the CV world, as made clear by the recent ACC and American Society of Nuclear Cardiology (ASNC) health policy statements on this topic (17,18). At a minimum, each imaging laboratory should review its policies and procedures and patient flow from a patient's viewpoint. However, that does not substitute for the patient's own voice: collecting and acting on patient satisfaction survey data are essential.

Patient-centered care includes both informed and shared decision making (17,19). Whereas the practice of informed consent is generally followed in imaging laboratories, the content of the consent may need to be addressed to encompass the concept of more active patient involvement in care decisions. Although imagers quote statistics about risk of esophageal perforation with transesophageal echocardiography or malignancy risk with a specific radiation exposure before gaining consent to perform a procedure, to effectively incorporate the patient into the decision to proceed with an imaging test requires a new model. Not only will the patient need more education about the testing options, risks, and safety but also this discussion will need to be performed long enough before the test so that there is time for discussion. Such efforts will require development of education tools in addition to mechanisms for the patient to discuss with primary care physicians and imagers (19).

The national effort to improve health information technology has implications for access as well as quality. Computer order entry systems will become the standard and, if customized properly, can allow for more rapid and accurate order transmission (including better communication of the clinical question), decision support, education regarding utilization, and other advantages. Further, a robust electronic health record offers the possibility of more rapid reporting and, eventually, remote access to images themselves, an invaluable aid as patients commonly receive care in more than 1 location. However, unless the imaging laboratory leadership is actively engaged in contributing to the design and implementation of health information technology systems, these potential advantages may not be well articulated or prioritized, and the implementation may fall short of meeting the imaging laboratory's true needs. Health literacy efforts will also undoubtedly push for patients to have rapid access to their imaging reports, and therefore, image management needs to be considered in any health information technology system.

As new technology comes to CV medicine, it is incumbent on imagers to ensure that the services they provide are appropriately valued and available to be integrated into new care pathways. Standard pre- and post-procedural evaluations may be required on the same day as electrophysiology and catheterization laboratory procedures to accommodate shorter hospital stays or even same day discharges. More complex evaluations (such as quantitation of cardiac dyssynchrony or optimization of resynchronization devices) may be required or examinations may be markedly more time consuming (such as the intraprocedural support required for structural heart disease interventions such as transcatheter aortic valve replacement and closure devices). The prolonged duration of these procedures raises questions about imager time and reimbursement that must be addressed in collaboration with the procedural team. Possible solutions range from the conventional but time-consuming approach of revising the

current procedural terminology codes to adequately cover those services that are more labor and time intensive, to more novel solutions such as prospectively negotiated sharing of procedural revenue.

Finally, the concept of access has the potential to be radically changed if proposed models for healthcare delivery, such as the development of patient-centered medical homes, are widely adopted. Under such constructs, primary care physicians (and occasionally specialists caring for common chronic diseases) function as gate keepers to the imaging laboratories, with financial disincentives to refer to specialists or perform testing. Another new healthcare delivery construct, the accountable care organization charges a combined physician-hospital organization with ensuring the quality and efficiency of the entire spectrum of care across a large population. Payers are experimenting with similar "quality contracts" that share savings between payers and providers (20). Although imagers may have previously been focused on carving out an identity in relationship to competing CV tests, initiatives like patient-centered medical homes and accountable care organizations are more likely to reduce overall test volume than force test substitution and to shift needed imaging to lower cost providers. Under any of these scenarios, it is essential that imagers clearly convey the value and quality of what they do, and proactively assist decision makers in designing and implementing care pathways that minimize both under- and over-use of imaging. An initial start to this process should be an evidenced-based evaluation of the role of cardiac imaging in the diagnosis and management of common cardiac diagnoses such as heart failure, valve disease, and coronary artery disease. Such information will be critical as cardiac imaging and its frequency are scrutinized by those determining what should be included in the typical episode of care for such diagnoses.

Cost

The term "cost" in the healthcare construct has many meanings, including the true incremental expense of performing an additional test (operational cost), and payment innovation that is undoubtedly part of the future of imaging and imaging physicians. Imaging expense has always been difficult to track precisely, and includes both fixed costs (the cost of setting up and maintaining a laboratory and doing the first test) as well as variable costs (the cost of performing each additional test). There are many avenues for imaging laboratories to reduce costs without adversely affecting quality; a full discussion is out of the scope of this paper. However, imagers should be encouraged to search for innovative approaches not traditionally considered. A cardiac imaging laboratory may be able to find purchasing partners to reduce costs of medications and supplies, whether in radiology departments or by volume discounts made possible by joint purchasing with other (perhaps competing) imaging laboratories. In any system in which imaging is part of a bundled payment, whether episode of care or diagnosis-related groups, the least expensive test is the one not done, provided, of course, that patient outcomes do not suffer. When imaging is required, each laboratory should consider implementing modality-specific testing protocols that can reduce costs. For example, nuclear laboratories may perform stress imaging first in lower risk patients without a history of coronary artery disease, thereby eliminating the need for rest imaging in patients with normal stress studies. In echocardiography laboratories, newer techniques such as contrast and 3-dimensional may reduce the time required for patient imaging (and coincidentally improve patient satisfaction and enhance test accuracy) while increasing throughput.

Traditional payment models incentivize laboratories to focus both internally (reducing expenses) and well as externally (maximizing revenues). Although minimizing expenses will always be desirable, reimbursement is changing dramatically and rapidly and in unpredictable directions. Regardless, reimbursement of individual tests will not be rising. For the time being, the imaging laboratory may see its best strategy as maximizing revenue in the still largely fee-for-service outpatient world and for professional fees, while minimizing expenses in the inpatient environment where diagnosis-related group payments treat the technical component of imaging as a deficit, which reduces margin on a fixed payment. However, under new care models such as those mentioned, health systems with multiple laboratories may actively redirect patients to the lower cost laboratories within the network, making the goal of maximizing revenue from charges irrelevant if not counterproductive. Outside of health systems, payers are experimenting with tools to provide more transparency about costs of care; Aetna has a software application designed to help its enrollees to search for lower cost options for needed services.

In the near future, reimbursement may be based on a single payment intended to cover the entire care of a patient for a year, much like the health maintenance organization payments of the mid 1990s, or a fee covering both professional and technical services for an episode of care (such as a percutaneous coronary intervention plus 3 months of follow-up). In situations such as these that do not acknowledge the extra expense of testing in some patients over others, the imaging laboratory and physician will need to demonstrate quality, availability, value, efficiency, and reduced downstream use of resources to justify receiving a piece of the fixed payment. Such arguments are much more effective if made prospectively at the time that "care bundles" are

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being created, and require the imager to be knowledgeable regarding system-wide challenges and persuasive regarding the value of imaging, as well as having the ear of decision makers. In these situations, imaging laboratories that can demonstrate accountability to provide appropriate use of studies will have an advantage. Virtually all AUC implementation studies demonstrate that most over-use is clustered into a narrow range of indications: testing of low-risk or asymptomatic patients or repeated testing, especially at frequent intervals, when there has been no change in clinical status (21). Demonstration of an appreciation for and willingness to implement the AUC in common episodes of care will help to demonstrate the imaging laboratory's cost efficiency in bundled payments.

A further wrinkle in healthcare reimbursement is the increasing adoption of pay for performance algorithms. Although part of hospital reimbursement for more than a decade, the at-risk percentage of total payment is increasing to double digits (22). Such concerns are now being extended to the imaging laboratory, where laboratory accreditation or other demonstration of appropriate imaging use may be more generously reimbursed. Further, such "value-based purchasing" is now being extended to physician payments, with a small percentage increase in reimbursement for meeting metrics in fee-for-service payment schemes (or a reduction for not meeting metrics). Although few imagers are now being held financially accountable for imaging quality, large group and employed physician compensation plans are increasingly using a physician's performance on quality metrics (which include imaging appropriateness) to determine an ever larger share of salary rather than solely basing salary on productivity. As physician payment models evolve, imagers should recognize that, in the future, compensation may be related to imaging quality metrics, and they should, therefore, be engaged now in defining the quality metrics by which they will be compensated; in the ever tightening healthcare economic environment, these will need to be robust.

Leadership

Implicit in the preceding discussion regarding the imager's role in the future healthcare environment is the need to find opportunity in the midst of change. This and other leadership skills, such as communications, financial literacy, and understanding governance and organizational cultures are essential. Many organizations provide content in these areas with course work intended for busy physician leaders, including the ACC's Cardiovascular Leadership Institute, (23) the American College of Physician Executives (24), and local universities' schools of business or public health. Although obtaining an MBA degree is an option for those wishing to pursue an administrative career full time (such as directing a heart center), it is time consuming and expensive. Attending selected courses may be more practical while still being useful to imaging laboratory directors.

The process of developing and executing a strategic plan can help to organize thoughts and actions, ensure engagement of all laboratory personnel and other stakeholders, and demonstrate commitment to finding solutions within an organization. Few imagers are "in charge" of CV service lines, but that does not mean we do not have any control over the direction of health care. Laboratory leadership needs to have the ear and the trust of service line leadership to advocate for the value of imaging in care plans and budgets, and ensure adequate space and personnel. To this end, knowing what the decision makers are up against and trying to accomplish is invaluable—stay informed. A dialogue that does not just push the imaging agenda but also acknowledges the challenges faced by the entire care team and proposes thoughtful integration of imaging will have more credibility. Participation in "care redesign" initiatives can also provide visibility and credibility. Imagers should understand that in the future we will be asked to provide more input than just an interpretation, such as weighing in on whether imaging is even required for a particular diagnosis, the preferred test, and the optimal timing of testing.

As physicians, it is sometimes easy to underestimate the importance of staff morale and loyalty on the front lines of care, including clerical personnel, nurses, technicians, and midlevel providers. This can provide a critical platform of resiliency and engagement required to implement unwelcome, but needed changes. Things as simple as communicating to the staff about the impending challenges and the rationale for changes can help keep the team engaged and enthusiastic. Physicians should develop strong partnerships with administrative and technical leaders within their laboratories as well as across health system and practice groups. Finally, reaching out to other imaging laboratories and finding common ground can turn them into colleagues and perhaps even allies rather than competitors.

Innovation and education are often the twin victims of cost-cutting measures. However, imagers must be creative in finding a way to maintain a learning environment. The drive for improved quality in imaging can be focused to provide both practice improvement as well as academic value. Home-grown solutions can substitute for expensive educational travel. For example, the ASE provides free continuing education units for sonographers for local conferences or laboratory meetings (25). Staff can educate their peers by presenting information on various topics—whether a recent interesting case (quality assurance) or a new guideline. Along these lines, academic laboratories need to learn to function without house officers or fellows, as duty hours and competing

rotations may make them scarce, However, imaging laboratories must work to provide a robust graduate medical education experience for trainees; otherwise, they risk marginalization in this important mission area.

Summary

The healthcare environment is undergoing rapid change, and there is substantial uncertainty regarding the future. In such unsettled times, it is critical to articulate one's mission, adhere to core values of honesty, transparency, and patient service, and yet be adaptable. That will help guide the imager's strategy and actions in ways that may not be apparent when focusing only on the superficial aspects of an immediate problem. CV imagers will be affected in unknown ways; however, through preparation and careful attention to the fundamentals of good health care (quality, access, and cost) and a sense of the likely direction of many changes, imagers can be leaders in thriving now and in the future.

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