

iVIEW

EDITOR'S PAGE

An Unfolding View of Imaging When Perception Becomes Unreal!

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We see things not as they are, but as we are.

—Source unknown (1)

Over the past decade, private and public payers have used a barrage of programs and policies to restrain growth and excessive utilization patterns within cardiovascular imaging. Dramatic cuts in payments, prior authorization programs, and reliance on proprietary algorithms to define appropriate use are now standard policies to guide reimbursement for the majority of cardiovascular imaging. There is a general perception among most within the cardiovascular community that these draconian policies to constrain growth were born of the overuse of cardiovascular imaging. Even a recent statement from the American College of Cardiology focused attention on the perceptibly high rates of cardiovascular imaging and the need for greater evidence to guide the development of clinical practice guidelines and appropriate use criteria (2).

But is perception reality? In this issue of *iJACC*, Farmer et al. (3) examine cardiovascular imaging utilization patterns from a large registry of patients presenting for de novo heart failure hospitalization. What is intriguing from this report is that unexpectedly low rates of imaging utilization were documented for this high-risk cohort of patients with heart failure. The first question that must be asked is how this could be, given all of the discussion about egregious and excessive imaging utilization practices.

Moreover, what happened to the old adage that imaging begets more imaging? This adage is commonly used by payers to guide coverage policies of denial for imaging procedures. Under this principle, it is perceived that an index procedure will open the “floodgates” to not one but multiple cardiovascular procedures and not just for the index episode of care but throughout the life of the patient. Interestingly, Farmer et al.’s (3) report reveals that very few patients underwent multiple procedures. Although one-half of patients with heart failure reasonably underwent echocardiography, most of the other common procedures were used in roughly 5% of patients. Coupled with the available data on appropriate use with a minority of patients having inappropriate indications for testing (4,5), it appears that a very different utilization pattern is emerging. This pattern may be an excellent example of perception driving an unreal view of the practice of cardiovascular imaging.

Of course, the report by Farmer et al. (3) was derived from within the Kaiser health care system and may reflect varying utilization patterns than would be observed elsewhere. However, and importantly, these data are exactly what are needed to curb speculation on what is driving growth in cardiovascular imaging practices. The absence of data always fuels misperceptions, and coupled with the high cost of care for imaging services, the default position among payers, regulators, and policy experts, not surprisingly, has been one of containment, concluding that imaging growth was undoubtedly due to overuse rather than any other equally plausible reason, such as growth in the number of patients needing imaging or newer data showing an advantage of imaging in certain conditions such as heart failure. One metric that raises oft-repeated concerns about cost of imaging is its dollar value increase over and

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above inflation; this economic index, although good for linking wages or consumer goods, is hardly the comprehensive benchmark for growth in medical care. What if this perception was not true, and the metrics were wrong? What if the need in the community has expanded greatly as a result of the growing prevalence of cardiac-predisposing risk factors such as obesity, diabetes, and hypertension, leading to incident heart failure or other cardiac symptoms? And what if this need has not been thoroughly documented? Of course, we are speculating, but what is clear is that policies and regulations guiding medical coverage and payments for cardiovascular imaging should be guided by a clear reality of existing practices.

Is the relentless drumbeat about the cost of imaging and the daily Sisyphean task of getting appropriate reimbursement driving us to the other extreme of underutilization and inactivity, becoming the easy way out? Could the underutilization of imaging be a possibility in Farmer et al.'s (3) paper? Once again, the lack of appropriate data on what is an appropriate level of use becomes a hurdle in protecting against underutilization. A recent paper describing the low rates of normal coronary angiography in the U.S. Department of Veterans Affairs, a closed system somewhat like the one in the present paper, illustrates this dilemma (6). Although the low rate of normal coronary arteries was interpreted as underutilization of this diagnostic modality, one could not be certain that these rates were appropriate compared with possible overutilization in the community (6,7). More important, imaging before referral to angiography reduced the chance of finding normal arteries, suggesting that increased use of imaging in certain situations might actually reduce the downstream use of inappropriate high-risk testing. More important, although there are emerging data that inappropriate use is associated with poorer outcomes, there is not enough information about the consequences of inadequate utilization. Undertesting is well documented, but its impact on clinical outcomes is less well studied, and there are thus few data to make clinically relevant decisions about appropriate rates of testing.

Are these data specific to the practice patterns of closed systems such as Kaiser and the Department of Veterans Affairs, which exert different degrees of institutional mandates on practice? These systems also divorce testing from compensation and thereby take away a purported incentive to imaging (8). That may very well be true, but the wide variation in testing among centers within this system, similar to the variations described among Medicare populations,

suggests only loose control of practice patterns. These data thus might be applicable to the general patient care practice.

As we envision the future, the denominator of "at-risk" patients should be defined on the basis of guideline-accepted or appropriate indications for testing using the infrastructure of electronic health records (EHRs) currently implemented across the country. Anyone with a rudimentary understanding of the current state of EHRs understands that these systems are organized largely for billing purposes, not for easily capturing and displaying clinical outcomes. Even with the enormous cost of these systems, an adequate derivation of indications for testing based on clinical practice guidelines and appropriate use criteria indications is extremely difficult. Any health care institution trying to demonstrate "meaningful use" would invariably find that demonstrating quality practices is challenging and far from seamless given the current structure of its EHR. Despite their promise of allowing clinical care nirvana and ersatz answers, using EHRs to guide quality improvement programs requires substantial manual review and collating of data across the health care system. In general, our EHRs exist in silos, and connecting across imaging laboratories to define quality practices is a daunting and labor-intensive practice. Extracting relevant quality data from existing EHRs was shown to be incomplete in 1 RAND Corporation study, with only one-third of the parameters available (9), and not surprisingly, EHRs at this time have not been found to significantly improve health care outcomes (10).

A data-guided health care system should lead the way forward in improving patient outcomes in the "real world." This is perhaps why the data from the Kaiser health care system and the Department of Veterans Affairs can be so helpful to our understanding of contemporary imaging practices. These health care systems have invested heavily in developing information technology systems that can guide patient care and improve quality. In our futuristic view, laboratories engaging in prudent imaging utilization practices would be rewarded through performance payments funded by reduced payments for suboptimal imaging practices. We are just now envisioning this world, where data guides our view of "real-world" consumption patterns of cardiovascular imaging.

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REFERENCES

1. Available at: <http://quoteinvestigator.com/2014/03/09/as-we-are/>. Accessed June 27, 2014.
2. Mark DB, Anderson JL, Brinker JA. ACC/AHA/ASE/ASNC/HRS/IAC/Mended Hearts/NASCI/RSNA/SAIP/SCAI/SCCT/SCMR/SNMMI 2014 health policy statement on use of noninvasive cardiovascular imaging: a report of the American College of Cardiology Clinical Quality Committee. *J Am Coll Cardiol* 2014;63:698-721.
3. Farmer SA, Lenzo J, Magid DJ, et al. Hospital-level variation in use of cardiovascular testing for adults with incident heart failure: findings from the Cardiovascular Research Network Heart Failure study. *J Am Coll Cardiol Img* 2014;7:690-700.
4. Hendel RC, Cerqueira M, Douglas PS, et al. A multicenter assessment of the use of single-photon emission computed tomography myocardial perfusion imaging with appropriateness criteria. *J Am Coll Cardiol* 2010;55:156-62.
5. Doukky R, Hayes K, Frogge N, et al. Impact of appropriate use on the prognostic value of single-photon emission computed tomography myocardial perfusion imaging. *Circulation* 2013;128:1634-43.
6. Bradley SM, Maddox TM, Stanislawski MA, et al. Normal coronary rates for elective angiography in the Veterans Affairs healthcare system: insights from the VA CART program (Veterans Affairs Clinical Assessment Reporting and Tracking). *J Am Coll Cardiol* 2014;63:417-26.
7. Patel MR, Peterson ED, Dai D, et al. Low diagnostic yield of elective coronary angiography. *N Engl J Med* 2010;362:886-95.
8. Shah BR, Cowper PA, O'Brien SM, et al. Association between physician billing and cardiac stress testing patterns following coronary revascularization. *JAMA* 2011;306:1993-2000.
9. Roth CP, Lim YW, Pevnick JM, et al. The challenge of measuring quality of care from the electronic health record. *Am J Med Qual* 2009;24:385-94.
10. Black AD, Car J, Pagliari C, et al. The impact of eHealth on the quality and safety of health care: a systematic overview. *PLoS Med* 2011;8:e1000387.