Ensuring Appropriate Use of Cardiac Imaging

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While the clinical benefits of cardiac imaging are irrefutable, there has been growing concern regarding overuse of imaging services in cardiology. Overuse has been defined as the provision of health-care services “under circumstances in which its potential for harm exceeds the possible benefit” [1]. Potential harms from overuse of imaging services include suboptimal clinical outcomes, radiation exposure, and the risks of unnecessary downstream procedures. However, imaging overuse may also have detrimental financial (out-of-pocket expense) and psychological (concern over clinically irrelevant findings) ramifications. The extent of overuse of cardiac imaging services is difficult to measure. This is related in part to the paucity of literature addressing overuse [2] and partly because the determination of clinical appropriateness (a surrogate for risk–benefit ratio) is an inexact exercise often driven more by expert opinion than by established science. Given the accumulating focus on both cost and quality of health care, overuse is in the crosshairs for politicians, payers, physicians, and professional societies.

The American College of Cardiology (ACC) Foundation and other professional societies are to be lauded for publishing Appropriate Use Criteria (AUC) for various cardiac imaging studies [3–6]. In these documents, the following definition of appropriateness is proposed: “An appropriate imaging study is one in which the expected incremental information, combined with clinical judgment, exceeds the expected negative consequences by a sufficiently wide margin for a specific indication that the procedure is generally considered acceptable care and a reasonable approach for the indication.” It is no surprise that there is considerable overlap between the definition of inappropriate (inferred from the definition of appropriate) and the definition of overuse cited

above. Adherence to the AUC would ensure avoidance of overuse and would also address underuse (a less prevalent but more publicized issue). More recently, the American Board of Internal Medicine Foundation, in its Choosing Wisely campaign, focused attention on overuse and inappropriate use of medical services [7]. In collaboration with twenty five specialty societies {including ACC, the American Society of Nuclear Cardiology (ASNC) and the Society of Cardiovascular Computed Tomography}, situations were identified in which the provision of care was not likely to enhance patient outcomes and/or where there was no literature supporting the provision of that care in a given clinical situation. The ACC and ASNC recommendations overlapped, but most concerned use of imaging in low-risk patients without cardiac symptoms.

Without additional intervention, however, the proportion of inappropriate studies seems not to have been impacted by the availability of AUC [8, 9]. When the application of AUC is combined with physician education and feedback, only modest and inconsistent improvement in inappropriateness is achieved [9, 10]. Furthermore, although a recent study suggests trend reversal [11], there has been a progressive increase in utilization of cardiac imaging tests [8, 12] such that the absolute number of inappropriate tests has been increasing. There is no doubt that this overuse increases the cost of care, and it is likely that the increased spending comes with no improvement in patient outcomes.

Reimbursement reduction has been used by some payers (most notably Medicare) in an effort to control costs. The major limitation of this approach is that it applies equally to both appropriate and inappropriate testing and therefore has no element of clinical selection. Furthermore, research suggests that reimbursement reduction may actually increase utilization as providers attempt to protect revenue streams [13]. In that situation, it is likely that clinical appropriateness of these additional studies will be compromised, further contributing to overuse. An additional undesirable (and probably unanticipated) result of reimbursement reduction for cardiac

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imaging has been the shift of care to a more expensive site of service. The financial stress on private practices as a result of reimbursement reduction has driven many practices to seek employment relationships with hospitals or other organizations. Imaging services provided under these employment arrangements are billed and reimbursed using the Hospital Outpatient Prospective Payment System. Commercial payers typically reimburse at a higher rate for these services than they do for similar services provided in private offices or freestanding imaging facilities. Ironically, these more costly services are likely to be provided in the same location, using the same equipment, and by the same personnel as services provided prior to the reimbursement reduction.

Clinical decision support (DS) has also been touted as a tool to control overuse of imaging services. At the point of order, providers receive feedback regarding the clinical appropriateness of the service requested. Ideally, services deemed to be inappropriate would not be performed (except in extenuating circumstances). However, provider compliance (defined as withdrawal of a request for testing deemed to be inappropriate by the DS system) was 9 % in a 2006 study [14]. Increased familiarity with the concept of DS in imaging did not improve performance in this regard. A 2011 study [15] documented provider compliance of only 2 % and cited other barriers to use including absence of guidelines to match some clinical scenarios, and intentional gaming of the DS system by providers. To date, DS use has been concentrated in academic institutions, and impact on the decision making of other provider cohorts has not been well documented. Given these limitations of DS, it is hardly surprising that current users and planned installations account for a minority of practices [16].

Specialty benefits management (SBM) companies are increasingly contracted by commercial payers to ensure clinical appropriateness of imaging services, to curtail overuse and thereby reduce unnecessary spending. The Government Accountability Office (GAO) in preparing its 2008 [17] report to Congress explored the role of SBM companies in curtailing utilization of imaging. GAO officials interviewed commercial health plan leadership who reported “significant decreases in utilization after implementing a prior authorization program.” Those interviewed noted that “annual growth rates were reduced to less than 5 percent after prior authorization; these annual growth rates had ranged for these plans from 10 percent to more than 20 percent before prior authorization programs were implemented.” The medical director of one health plan said that “prior authorization was the plan’s most effective utilization control measure, because it requires physicians to attest to the value of ordering a particular service based on clinical need.” Based on these findings, the GAO recommended that CMS increase “front-end management” of imaging services including preauthorization programs. The 2011 Medicare Payment Advisory Commission (MedPac) Report to Congress [18] reiterated this advice—“Because of CMS’s limited

resources, a prior authorization program should target advanced imaging services that account for a significant share of spending and volume, have evidence-based standards for appropriate use, and exhibit variations in utilization among providers and geographic areas.”

It is important to realize that SBM programs have varied designs. The traditional utilization management (UM) preauthorization model predicates payment of a claim for service on obtaining preauthorization. Claims for services which are requested and denied (based on failure to meet clinical criteria) and services which are performed without preauthorization will not be paid. In other models, there is no impact on claims payment but rather an attempt to educate regarding clinical appropriateness. Providers are required to seek preauthorization and to supply clinical information to justify appropriateness. When the request does not meet the clinical guideline criteria for authorization, the provider receives notification to that effect. However, if the service is subsequently performed, the claim will be paid. These two approaches therefore reduce utilization by targeting requests that are clinically inappropriate. In that regard, they differ from reimbursement reduction which penalizes providers for all services performed regardless of clinical appropriateness. A third approach requires providers to notify the SBM and provide some clinical information when they intend to perform the service. In this “notification only” model, the clinical appropriateness of the provider’s ordering pattern is analyzed and benchmarked postservice, and appropriate ordering behavior can be integrated with pay for performance or future reimbursement models.

Of the program designs outlined above, the traditional UM preauthorization program is the only one associated with “hard” denial. However, the percent decrease in utilization with this program design does not equate to the percent of denied requests. The “sentinel effect” (studies which are not requested because the program is in place) added to denials, request withdrawals, and redirections to other imaging studies all contribute to the program effect on utilization. Similarly, with the provider education model (with no impact on claims payment), the decrease in utilization is the sum of the sentinel effect and the tests which the provider decides not to perform based on feedback from the SBM. Even notification only models see a significant sentinel effect. It would appear that when providers are aware that utilization is under scrutiny, they tend to modify ordering patterns.

Preauthorization is particularly applicable to some, but not all, discretionary outpatient imaging services. Payers are most interested in applying such programs to services associated with large health-care expenditures and/or those with high utilization trend (year-over-year increases in utilization). Geographical variability in utilization is also a marker of potential overuse. However, from the SBM perspective, perhaps the most important requirement for inclusion in a preauthorization program is

the availability of robust clinical guideline documents. Cardiac imaging services are frequently included in preauthorization programs because they are high-cost services with increasing utilization trend displaying geographic variability. The American College of Cardiology Foundation AUC can be used as the foundation for clinical guidelines against which imaging requests can be adjudicated for clinical appropriateness.

Although preauthorization programs reduce utilization of imaging by removing clinically inappropriate studies, this approach is not without limitations. The administrative burden of communicating clinical information to the SBM and the delay in provider notification regarding the results of the outcome of the adjudication, are frequently cited as shortcomings of this approach. The need for a payer to contract with an SBM adds administrative cost, although the fact that the number of services subject to preauthorization is steadily increasing would suggest that the return on this investment is justified. Infrequently, providers disagree with the clinical guidelines used by SBMs. Use of society-generated AUC and recent peer-reviewed literature as the basis for SBM guidelines has reduced the frequency of these disagreements.

Ultimately, the ability of the provider to communicate with the SBM via the electronic medical record (EMR) will reduce the administrative burden. The objective of interoperability solutions is to enable next-level administrative efficiency and clinical appropriateness functionality within provider's CPOE/EMR installations and workflow. The more widespread availability of EMR systems, combined with meaningful use terminologies, and payment incentives creates opportunities for seamless system and data integration that most SBMs fully support. An integration of clinical appropriateness review systems and EMR system will allow providers to more seamlessly integrate the clinical appropriateness review into the interaction with their patients and their internal workflows.

It might be expected that cardiologists would be more familiar with AUC and other literature and would therefore be more likely to order a higher percentage of appropriate studies. However, this is not the case. A 2012 study revealed that there was no significant difference in appropriateness of ordering between cardiologists and for other noncardiologist provider groups [19]. This paradoxical finding may be attributable, at least in part, to the fact that cardiac imaging studies ordered by cardiologists are frequently self-referred. Self-referral is known to increase utilization of imaging services [20, 21] including cardiac imaging [22]. In fact, a 2011 study published in the *Journal of the American Medical Association* demonstrated that utilization of myocardial perfusion imaging and stress echocardiography was highest when providers billed for both the technical and professional components of these exams, intermediate when only the professional component was billed and lowest study was referred to another provider and the ordering provider was not involved in billing [23]. Any suggestion that measures aimed at improving

appropriateness of cardiac imaging should exclude cardiologists is not supported by the literature cited above. While in office imaging may have advantages in terms of patient satisfaction, convenience, and access to care, self-referral is likely to remain a driver of inappropriate use (abuse), to some degree, until the "loophole," which allows in-office ancillary services, is closed.

Payment models other than traditional fee for service, which are currently receiving considerable attention, may also have a role in improving appropriateness (thereby reducing abuse) of cardiac imaging services. Medical home models and accountable care organizations will both focus attention on evidence-based provision of services and the impact of all services on patient outcomes. The balance between risk and benefit of a service (which is closely aligned with the definition of abuse) will probably inform more clinically appropriate use of all services, and cardiac imaging will be no exception.

Conclusion

Several factors speak to the need to manage the use of noninvasive cardiac imaging including high unit cost, high utilization, positive utilization trend, geographical variability in utilization, and the impact of self-referral. Potential management approaches include reimbursement reduction, DS, and SBM-directed preauthorization. Ideally, a management program should only target those studies which are not clinically appropriate. Both DS and preauthorization are focused on clinical appropriateness, but initial experience with DS has uncovered some operational difficulties such that inappropriate studies are not removed. At the present time, preauthorization appears to be the most successful approach to reducing utilization and improving clinical appropriateness. Future payment reforms may have a favorable impact on the appropriateness of clinical decision making as it pertains to noninvasive cardiac imaging.

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