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Imaging Appropriateness and Implementation of Clinical Decision Support

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The Institute of Medicine has estimated that 30% of all dollars spent on United States health care are wasted [1]. Although imaging's contribution to that waste is difficult to pinpoint, most sources agree that inappropriate imaging is both widespread and commonplace [2]. Every inappropriate imaging examination places unnecessary, unwanted upward pressure on total health care system costs. From a system perspective, those unnecessary costs, both direct and indirect, are incurred in scheduling, protocoling, performing, monitoring, interpreting, and communicating examinations. From a clinical and quality perspective, patients can be harmed. Any imaging examination can be stressful, so an inappropriate one unnecessarily burdens the patient with anxiety, especially when associated with an access delay. The examination itself can be uncomfortable or incur risk (albeit small) from radiation and/or contrast media. Importantly, inappropriate examinations displace necessary ones, delaying diagnoses and subsequent treatments for more needy patients. In an era of higher deductibles and copayments, this translates into ever increasing upfront costs to patients. In short, inappropriate examinations add no value to the system, only costs.

Fee-for-service reimbursement systems, however, provide few incentives for ordering physicians to address imaging appropriateness, which ultimately rewards higher spending and associated waste. Most payers have therefore imposed prior authorization (PA) requirements for high-cost imaging. More recently, payers are also mandating different organizational structures (accountable care organizations) and payment models (bundled payments and population health management) to reposition care delivery to a model that is focused more on value than procedural volume, with the goal to reduce waste and cost. Consequently, external PA requirements become unnecessary, and probably wasteful, once budget-based systems (such as accountable care organizations) are adopted. Performing within a fixed budget incentivizes all within the system (those who order imaging, as well as those who provide it) to identify and eliminate unnecessary care and cost. As budget-based systems are adopted, the challenge becomes how to find practical ways to define imaging appropriateness, translate evidence and experience into appropriate use criteria (AUC), develop systems to allow these AUC to be provided within the clinical workflow, and learn from the data generated by the process so that the entire effort can be continuously improved.

Currently, injudicious imaging is poorly managed across most organizations; it is simply not possible for busy radiologists to vet every examination request, despite their best efforts. Besides, even subspecialty radiologists struggle to keep up with the latest imaging indications for a given clinical scenario, let alone referring physicians. As a result, in many, perhaps most, practices, the majority of examination requests are automatically granted, regardless of their appropriateness.

Given the multiple logistic hurdles, the depth of knowledge required at the point of care, and the changing indications, it was argued previously in this series that in the end, AUC can be managed effectively only when they are embedded into electronic order entry clinical decision support (CDS) tools [3]. Simplistically stated, CDS is a medical management tool that guides referring physicians, at the point of care, to order the right test for a particular patient at the right time. Sometimes—and importantly—this means no test at all. Rather than doctors deciding, often in a vacuum, which imaging test is necessary, a computer algorithm now informs them using best practice guidelines. Some organizations have precluded discordant orders from proceeding further, but most CDS systems still allow dissent (and rightly so,

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considering that the algorithms are not perfect), with an opportunity for real-time consultation with a radiologist.

For CDS to be successful, it must be comprehensive and seamlessly integrated into existing electronic health records or web-based portals. Its credibility hinges on its foundation in the latest evidence-based medicine available. Some referrers (and even radiologists) may be skeptical given that the evidence for imaging appropriateness (and hence CDS) is incomplete. But no CDS tool will ever be perfect; evidence-based medicine will evolve in perpetuity. Better to deliver the current best practices, despite their flaws, and remove unnecessary variation and costs, rather than wait for perfect practices that will never be achieved. If for no other reason, physicians should embrace CDS to mitigate the bureaucratic third-party PA process that remains the bane of many ordering physicians.

Now in place for nearly a decade at some institutions, CDS systems have demonstrated substantial benefit and cost savings to referrers, radiologists, patients, and payers alike [4]. Indeed, Congress has taken so much notice that it has mandated that beginning in 2017, all providers billing for advanced imaging services on Medicare patients will need to demonstrate the use of CDS on the basis of government-approved, evidence-based AUC. With little more than a year to go, many hospitals and other facilities are woefully unprepared to comply, and so it will behoove them to fast-track their evaluation, purchasing, and implementation of CDS systems.

CDS in itself, however, is not a magic bullet. But its successful implementation and management will be prerequisites to managing appropriateness on a large scale. Through either conventional administrative mind-sets or a need to hastily purchase a CDS product to comply with congressional mandates, some radiologists and other relevant stakeholders are missing important opportunities to participate in the evaluation, purchasing, and operational and educational implementation of CDS. At some institutions, radiologists are even unaware that their organizations have already negotiated CDS purchase contracts. This portends trouble; for successful implementation, all major stakeholders must be at the table from the get-go. Ideally, a development team of radiologists (the experts in imaging), their administrators, and other physician leaders (including the chief medical officer) and relevant administrative and IT personnel (including financial officers) will together be charged to evaluate CDS evaluation and implementation. Such a team approach will gear its adoption for success and ensure that the process is referrer-centric (rather than radiologist-centric).

CDS implementation will be a true exercise in change management, given that it fundamentally changes a workflow that has been in existence since imaging began. Change management processes have been well described both within and outside of medicine, which ultimately comes down to effective leadership and teams. There is no substitute for choosing the right team members, planning, setting clear goals, transparency, communication, monitoring, feedback, and iteration (where needed). Those organizations that have successfully managed this process have mitigated many potential obstacles by setting clear goals and prioritizing transparency and communication. Effective training seminars should be instituted early and often, and a robust, educated, and willing team will need to be ever present to offer referrer support, particularly during system startup. It is advised to plan a phased implementation, beginning with enthusiastic providers in the outpatient setting whose patients are generally less acute. Given the pace of their workload, the acuity of their patients, and the 24/7/365 nature of their business (when many IT support personnel may not be available), emergency department physicians will be better engaged after initial successes have been demonstrated elsewhere.

Once CDS is operational, individual and group performance data can be mined and analyzed in a variety of ways. Early adopters have noted that feedback on referrer performance has generally been well supported; most physicians are eager to understand how they are benchmarked against their colleagues. In the early stages, it may be most fruitful to anonymize shared benchmark data (aside from the individual in question) to avoid the appearance of punitive intent. Departmental leaders should, however, be granted access to their physician employees' performance to address outlier variance, if warranted.

Managed well, early experience has shown that most providers rapidly adopt CDS and ultimately appreciate the framework it creates for learning and improving care. Such point-of-care interfaces are also useful in managing and educating patients who demand unnecessary tests. Physicians who practice defensive medicine may additionally find reassurance that they are in compliance with national guidelines. Interestingly, most

referrers have shown little interest in gaming the system to gain the tests they (or their patients) think they need.

In summary, CDS tools present a major opportunity for managing imaging appropriateness. Although current tools are not perfect, they are already reducing variation, waste, and cost, making them a key value enhancer for patients. Implementation, however, will require a robust change management process involving a comprehensive team of relevant stakeholders with clear, shared goals for planning, implementation, and maintenance. Given the impending 2017 congressional mandate requiring CDS as a prerequisite for payment for advanced imaging, organizations must prepare now.

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