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Emergency Department Diagnostic Imaging: The Journey to Quality

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Abstract

Priorities in health care delivery are shifting, with a greater focus on enhancing value, incentivizing quality, and advancing population health. While measurement of quality in emergency department (ED) care is still in its infancy, performance measures are increasingly being linked to reimbursement to encourage the delivery of high-value care. With such changes, there will be growing oversight of diagnostic imaging in all clinical settings, including the ED. Here, the authors examine the current state of quality measurement as it pertains to ED imaging. The authors review relevant policies and discuss both the associated challenges and the facilitators of using quality measures to help optimize ED imaging. Understanding such factors will help ensure the delivery of diagnostic imaging that is appropriate, high-quality, and patient-centered.

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AN INTRODUCTION TO QUALITY AND EMERGENCY DEPARTMENT IMAGING

At the turn of the century, the Institute of Medicine (IOM) released two reports, "To Err is Human" and "Crossing the Quality Chasm," that highlighted the significant shortcomings of the U.S. health care system to provide safe, high-quality care.[1,2] Subsequent accounts have also documented how Americans commonly suffer preventable harm, often due to dramatic underuse or overuse of health care services.[3–5] It has been estimated that as much as one-third of care involves overuse, which has been defined as "the use of a service that is unlikely to improve patient outcomes or for which potential harms exceed likely benefits," and efficiency of resource use has been identified as one of the IOM's six aims for quality.[1,4]

Researchers have identified diagnostic imaging as an area of rapid growth in the ED setting, with wide practice variation that has not often been linked to high quality of care.[6–12] Advanced imaging—particularly computed tomography (CT) and magnetic resonance imaging (MRI)—are increasingly used in the ED and have been identified as areas of overuse.[6,7,9–17] While advanced imaging utilization dramatically rose between 2000 and 2010, there is some evidence that the use of diagnostic imaging has slowed or even declined more recently.[18] For example, Medicare spending for imaging services decreased from $10.6B to $10.0B (−5.1%)

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between 2011 and 2012, in part due to a drop in the number and complexity of imaging services per beneficiary.[19] This slowdown has also likely resulted from a combination of utilization management tools (radiology benefit managers, clinical decision support, etc.), increased physician and patient awareness of radiation exposure, improved access to electronic health records, and more widespread commitment to cost-conscious care, among other reasons.[18]

Despite such trends, one recent methodologically robust study found Medicare beneficiaries frequently receive "low-value imaging services," as defined by the American Board of Internal Medicine Foundation's Choosing Wisely campaign, the U.S. Preventative Services Task Force "D" recommendations, the National Institutes of Health and Care Excellence "do not do" recommendations, and the Canadian Agency for Drugs and Technologies in Health health technology assessments.[20] Additionally, in one recent survey of emergency physicians, 97% of respondents acknowledged personally ordering some CT/MRIs for nonmedical reasons.[7]

Furthermore, five of the 10 American College of Emergency Physicians (ACEP) Choosing Wisely campaign measures—developed to encourage conversations between providers and patients about low-value, potentially avoidable practices—involve imaging tests.[21] Importantly, the evidence for these measures is primarily based on observational trials, and the effects of the campaign on quality and cost outcomes remain largely unknown.[22] Monitoring for unintended consequences, especially the reduction of high-value care, will be paramount. Nevertheless, it remains possible that the current list of Choosing Wisely measures may represent just the tip of iceberg in terms of potentially avoidable practices, as the ACEP task force considered over 200 items during the initial selection of measures.[21]

In addition to educational outreach efforts, performance quality measures are increasingly being linked to reimbursement as an attempt to reduce the delivery of low-value diagnostic services.[15–17,23,24] Performance measures may have greater potential to improve care and save costs, especially if coupled with physician feedback, public reporting, clinical decision support, financial incentives, and tort reform.[23] For example, strategic use of measurement data has supported integrated quality improvement efforts on central line–associated bloodstream infections. Between 2008 and 2013, these initiatives reduced infections by 46%, saved over 50,000 lives, and averted as much as $1.8 billion in excess health care costs.[25] Data on the efficacy of ED imaging-related performance measures remain relatively sparse. However, one prospective multicenter trial found that 32% of ED imaging performed for suspected pulmonary embolism may be avoidable based on a National Quality Forum (NQF)-endorsed measure aimed to improve application of CT in patients with low pretest probability for pulmonary embolism.[17]

LEGISLATIVE EFFORTS TO IMPROVE QUALITY

The Patient Protection and Affordable Care Act (ACA) tasked the Department of Health & Human Services (HHS) to establish the National Quality Strategy in 2011. Six priorities were identified that include: health and well-being, prevention and treatment of leading causes of mortality, person- and family-centered care, patient safety, effective communication and care coordination, and affordable care.[26] The role of emergency medicine (EM) to aid the goals of the National Quality Strategy has recently been well articulated.[15,27] The authors highlight ongoing research in EM on shared decision-making for high-cost imaging decisions, for example, to advance patient-centered care.[27–29] They also propose quality measures for imaging efficiency, such as the appropriate use of CT for minor head injury, while recognizing the importance of risk stratification and having safeguards to prevent any inadvertent resulting underuse.[15] Overall, quality measures that are aligned with the National Quality Strategy priorities will help transition our entire health care system to one that provides consistent high-quality affordable care at the population level.

With substantial literature suggesting that more care does not necessarily result in better patient outcomes,[30,31] HHS recently outlined a policy to move the U.S. health care system from volume-based to value-based care (i.e., higher quality care at the same or lower costs). In an aggressive plan, it is expected that 30% of fee-for-service Medicare payments will be tied to quality or value through accountable care organizations or other alternative payment models by 2016, and 50% by 2018; in fact, 85% of all Medicare payments will be tied to quality or value by 2016, and 90% by 2018.[32] Recent passage of the Medicare Access and CHIP Reauthorization Act (MACRA), commonly known as the "Sustainable Growth Rate fix," also mandates that physician compensation be increasingly adjusted based on value of care provided and participation in alternative payment models. In concert with Medicare's Value-Based Payment Modifier included in the ACA, high-value providers will get financial bonuses, while low-value providers will be penalized.[15] Up to 10% of physician payment and 6% of hospital reimbursement is currently at risk with recent payment reform efforts, and these percentages are expected to grow. Such legislation also aligns with the 2014 Protecting Access to Medicare Act (PAMA), which incentivizes physicians to consult evidenced-based clinical decision support systems to guide appropriate use of advanced imaging by 2017.

CHALLENGES IN DELIVERING HIGH-QUALITY IMAGING

Measurement of quality in ED care is still at an early stage[15,33,34] and few existing measures currently involve imaging.[34] Prior attempts to develop imaging efficiency measures have had missteps. Whereas PAMA aims to support appropriate imaging, past proposed quality measures have at times simply focused on utilization to gauge value and efficiency.[14,35,36] High utilization rates were assumed to be inefficient. While utilization measures may be easy to develop and implement, they can lead to provider backlash and unintended patient harm if constructed independent of quality or appropriateness.[23,36] This was most recently exemplified in the

Centers for Medicare & Medicaid Services (CMS)-proposed measure of head CT use in ED patients with headache.[14,35,36] Some have argued that utilization measures may be improved by assessing rates of negative test results.[23] However, even with such an approach, it remains essential to account for relevant patient exclusions, to incorporate risk adjustment and patient shared decision-making, to link cost and quality data, and to have safeguards (including quality measures) in place to prevent patient harm from unintended underuse.[37]

The tension between utilization and appropriateness is just one of many challenges in the field of measurement. While this article emphasizes imaging efficiency, there are several related areas within EM that require attention. For example, preventable diagnostic errors are common in the ED, resulting from the many unique features of EM practice (high levels of uncertainty, high decision density, frequent interruptions, etc.).[38,39] Despite substantial literature on the topic, there has been little focus on developing performance measures to assess and prevent diagnostic error, which is especially important to consider alongside imaging efficiency measures that may result in underuse.[15] Similarly, few quality measures currently assess the management of patients with undifferentiated signs or symptoms, which is essential to highlighting the processes involved in delivering high-value care in the ED.[33,34] Finally, fear of malpractice has consistently been cited as a driver of diagnostic imaging overuse in EM.[7,40] Emergency physicians should not be financially or professionally penalized by policy makers' efforts to reduce "unnecessary" testing retrospectively and legislatively. Thus, while tort reform alone will not be enough to address medical excess,[7,41] the effect of performance measures will be hindered without accompanying meaningful and sustained reform efforts. Future measurement efforts to improve emergency care should address these areas of critical importance to the specialty.

THE WAY FORWARD

Existing measures commonly assess care provided by individual clinicians or clinician groups. Along with the sheer volume of quality measures, such targeted individual focus may contribute to "measurement burden." Future measures will hopefully be increasingly patient-centered (e.g., assess patient-reported outcomes), focus on the entire episode of care (e.g., encompass care provided from the initial symptom of chest pain through the post–myocardial infarction rehabilitation phase), and assess patient outcomes across an entire coordinated health system.[15,25] Given the contribution of multiple providers to ED imaging (emergency physicians, radiologists, referring/consulting physicians, etc.), along with the rapid expansion of shared accountability in accountable care organization-type models, understanding care at the health system level will be a more optimal approach.

Future measures will also increasingly take advantage of "big data" including EHR capabilities. Electronic quality measures (E-measures) remain limited by lack of interoperability and structured fields required for assessing imaging appropriateness, for example.[33,42] However, innovative work using natural language processing is under way to continue advancing measurement potential from the electronic health record.[33,42] Other approaches, such as novel measurement algorithms for identifying low-value imaging services in claims data, also hold promise.[20]

Just as improving ED imaging efficiency requires the cooperation of many parties, successful measure development also requires the collaboration of key stakeholders. Through a measure incubator, the NQF intends to facilitate measure development by streamlining the approach. The NQF will match groups that fund, develop, test, endorse, and implement measures to establish agreement on the highest priority measurement issues and address those priorities in a rapid and effective manner. This idea will reduce the likelihood of duplicative measure development efforts and benefit from uniting the resources and expertise in idea generation, data, technical support, technology, and methodology.[43] For diagnostic imaging in EM, the hope is the NQF measure incubator could help promote accurate and reliable measures of imaging appropriateness that are actionable, meaningful, and lead to better health outcomes.

CONCLUSIONS

Given the changing landscape of health care, with focus on enhancing value, incentivizing quality, and advancing population health, there will surely be greater scrutiny and oversight of imaging in all clinical settings, including the ED. As decision-support systems and appropriate-use criteria are optimized and integrated into electronic health records, performance measures will help achieve imaging efficiency in a safe and high-quality manner. Especially if such advancements are pursued within a continuously learning environment with rapid-cycle feedback and improvement,[5] our health care system will move more toward care that is "patient-centered, focused on quality, mindful of costs, and vigilant against waste."[25]

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