Clinical Decision Support (CDS)
Clinical Decision Support (CDS) systems to ensure that appropriate imaging studies are ordered and performed is not a new idea. The American College of Radiology (ACR) has been developing and recommending appropriateness criteria (AC) for imaging procedures for many years. From 2000-2010, Brigham and Women’s Hospital in Boston, after pilot testing and user feedback, phased in a Web-enabled CPOE system with embedded imaging clinical decision support across outpatient, emergency department and in-patient settings.\(^1\)

But now radiology faces a legal requirement to implement CDS for advanced imaging by 2017, leaving many questions and issues to be resolved in a relatively short period of time. (See the timeframe at the end of this article).

**LEGISLATIVE REQUIREMENT FOR CDS**

In the spring of 2014, CDS programs were showcased as one of the main provisions, section 218, of the Protecting Access to Medicare Act of 2014 (PAMA), otherwise known as the SGR/Doc-fix bill. This legislation began the process that requires, beginning January 1, 2017, physicians ordering MRI, CT, nuclear medicine and positron emission tomography (PET) imaging services to consult appropriate use criteria (through some CDS mechanism). The legislation applies to the Medicare Physician Fee Schedule, Outpatient Prospective Payment System, and the Ambulatory Surgery Center payment system.

The bill is meant to incentivize ordering physicians to embrace Appropriate Use Criteria (AC) when coordinating medical imaging exams for patients and gives the HHS secretary authority to identify decision-support tools for physicians to use when ordering imaging tests. Ordering physicians would answer specific questions concerning the patient’s condition to order the correct imaging study for that condition. In an interview with Diagnostic Imaging, Safwan Halbi, MD, radiologist and director of imaging informatics at Henry Ford Health System said, “Many providers would like to see the CMS and other payers give preference or access to providers who use CDS instead of relying on radiology benefit management (RBM) companies or pre-authorization processes.”\(^2\)

However, in reporting information to CMS, the onus is on radiology. Effective, January 1, 2017, in order for those professionals and entities **furnishing** radiology services (including hospitals) to be paid by Medicare for advanced diagnostic imaging services, furnishing providers must certify that professionals ordering advanced diagnostic imaging services consulted appropriate use criteria applicable to the

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\(^1\) Medical Press, “Large hospital successfully implements CPOE system with clinical decision support for radiology,” February 1, 2012.

ordered imaging modality. Radiology professionals and entities will be required to specify on the Medicare claim:

- Which qualified clinical decision support mechanism was used to consult the appropriate use criteria, and
- Whether the service ordered adheres to those criteria.

The bill also establishes specific requirements for CDS systems along with a time frame for each step. **(see the end of this article)**

**BENEFITS OF CDS**

Current best practices suggest that CDS systems now provide an alternative to RBMs and other pre-authorization approaches. The functional CDS system incorporates the following:\(^3\)

- Can readily be incorporated into daily work processes.
- Processes requests in real-time with minimal disruption or interference (i.e., moves from requests for imaging procedures to approval and performance if indicated, or to communication between the requesting health care provider and the imaging expertise inherent in the CDS system if there are questions or concerns).
- It is efficient, user-friendly, consistent and educational, with immediate feedback as to the recommendations.
- It is based on clinical guidelines that are produced using a sound methodology, are evidence-based to the greatest extent possible, supplemented as needed by clinical expert opinion, transparent and readily reviewable and are regularly updated.
- By using sound guidelines and realistic systems, the CDS will allow real-time evaluation of the appropriateness of a requested imaging study and will eliminate the need for any other system of pre-evaluation or pre-certification.
- The CDS system will, through vendors, allow feedback between the creators of the guidelines and the users, and thereby facilitate both improved guidelines and local quality improvement for systems and for individual imaging ordering providers.
- Consequently, the CDS system will produce quality measure and outcome data.
- In order to assess continuous performance improvement longitudinally against benchmark data, the CDS system will supply utilization data to providers that support networks.

Supporters feel “CDS is a cost-effective, efficient, and reliable method for analyzing the clinical indications of a patient and comparing those indications to evidence-based data sets, allowing physicians to recommend the most appropriate course of treatment for the patient. This can include a recommendation for no imaging study or to change the requested study to one that is more medically appropriate. The electronic CDS process serves as documentation that the patient is to receive the most appropriate care under the circumstances presented. The benefits of CDS leverage data, drive decision making, improve quality and safety, and help reduce costs by ensuring the right imaging

Several CDS systems are currently commercially available, and the consideration to use such systems is quickly growing amongst health care systems, payers and regulators. CDS can benefit radiology in several ways:

- Having a patient’s clinical history available to radiologists at the time of study interpretation can be extremely helpful in how radiologists evaluate and interpret reports. It allows the radiologist to understand why a clinician is ordering a study so the radiology report can answer the referring clinician question(s).
- The reduction of inappropriate and redundant testing allows radiologists to focus on appropriate imaging procedures and improves patient safety through the avoidance of unnecessary radiation resulting from such testing.
- CDS can tie utilization of evidence-based imaging guidelines with patient outcomes.5

**CDS BACKGROUND AND USAGE**

At the SIIM 2014 Annual Meeting, experts in decision support systems claimed CDS can be a great addition to the ordering workflow although they were not totally on board with whether radiology order entry decision support alleviates the inappropriate use of imaging or impacts quality safety outcomes. They also suggested the system should “provide comprehensive utilization management, which would provide an opportunity for radiologists to conduct peer-to-peer consultations with physicians and provide guidance on ordering more appropriate tests and feedback on adherence to guidelines.”6

In 2013, the ACR contracted with the National Decision Support Company (NDSC) to provide the technical platform, support and licensing of its copyrighted AC under the name ACR Select. The College has been urging radiology members, ordering physicians and administrative members to learn how ACR Select operates. NDSC provides electronic health record (EHR) vendors with a direct method for health care organizations to integrate and use the ACR AC guidelines in daily practice. The ACR’s AC is also now available in a digitally consumable format to be incorporated into other computerized ordering and EHR systems.7

The Henry Ford Health System’s Department of Diagnostic Radiology in Detroit, Michigan conducted a study to examine the effect of integrating point-of-care CDS using the AC into an inpatient computerized provider order entry (CPOE) system for advanced imaging requests.8

Over a period of 12 months, inpatient CPOE requests for nuclear medicine, CT, and MRI were processed by the CDS to generate an AC score using provider-selected data from pull-down menus.

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6 Senate Committee on Finance, ”Computerized Decision Support (CDS) Systems for Advanced Imaging Services, Imaging e-Ordering Coalition, November 12, 2013
During the second 6-month period, AC scores were displayed to ordering providers, and acknowledgment was required to finalize a request. Request AC scores and percentages of requests not scored by CDS were compared among primary care providers (PCPs) and specialists, and by years of practice of the responsible physician of record.

Researchers found integrating CDS into inpatient CPOE slightly increased the overall AC score of advanced imaging requests as well as the provision of sufficiently structured data to automatically generate AC scores. Both effects were more pronounced in PCPs compared with specialists.

CDS prospectively generated a score for 26.0% and 30.3% of baseline and intervention requests, respectively. The average AC score increased slightly for all PCP requests and minimally for specialists. The percentage of requests lacking sufficient structured clinical information to generate an AC score decreased for all requests (from 73.1% to 68.9%), for PCPs (78.0% to 71.7%), and for specialists (72.9% to 69.1%).

To offer more assistance to providers, the federal Agency for Healthcare Research and Quality (AHRQ) plans to launch an initiative to distribute and implement patient-centered outcomes research (PCOR) findings through clinical decision support (CDS) at the point of care.

The initiative includes creating a PCOR CDS Learning Network to drive the field of CDS forward and to conduct CDS projects to extend existing or develop new CDS based on PCOR findings. In addition, AHRQ plans to develop tools to help CDS artifacts become more shareable, health IT standards-based, and publicly available. The PCOR CDS Learning Network will build a community of stakeholders, including clinicians, patients, professional associations, health IT developers, and others. The goal is to scale existing, well-established CDS beyond the initial setting or institution in which the CDS was developed as well as to develop new, CDS from PCOR findings and demonstrate its effectiveness to improve care in clinical practice.9

FUTURE RAMIFICATIONS

The federal requirement for CDS now only applies to radiology but it appears that other specialties may also face similar requirements. For example, the same PAMA law requires the U.S. Government Accountability Office to issue a report in 2015 on whether similar requirements could be applied to other Medicare-covered services, including radiation therapy.

TIMEFRAME AND REQUIREMENTS FOR IMPLEMENTING CDS FOR MEDICARE

While there is serious doubt that these mandated timeframes can be met with practical solutions, the PAMA legislation established this timetable:

November 15, 2015 – the appropriate use criteria must be defined by the Secretary through CMS in consultation with physicians, practitioners and other relevant stakeholders. The criteria must be developed or endorsed by national professional medical specialty societies or provider-led entities and must be evidence-based, to the extent feasible.

April 1, 2016 – a listing of the different qualified CDS mechanisms that ordering professionals must consult must be specified and can include modules in certified EHR technology, private sector mechanisms that may include clinical support mechanisms available from medical specialty organizations, or mechanisms established by HHS. These support mechanisms must meet the following criteria to be qualified by CMS:

- Make available the appropriate use criteria and supporting documentation
- Determine the extent to which the ordered imaging service meets the appropriate use criteria
- Create documentation to demonstrate consultation by the ordering physician
- Maintain the latest appropriate use criteria with timely updates should changes occur
- Meet privacy and security standards.

January 1, 2017 – CDS use by the ordering physician will be required for advanced diagnostic imaging services [defined to include magnetic resonance, computed tomography, nuclear medicine, and positron emission tomography imaging services]

January 1, 2020 – prior authorization will be required for advanced imaging services ordered by “outlier” ordering professionals. Outliers will be determined by CMS based on their low adherence to the specified applicable use criteria (using two years of data after January 1, 2017) and can represent no more than 5% of ordering physicians.