



INSTITUTE FOR CLINICAL SYSTEMS IMPROVEMENT

Decision Support for Ordering Appropriate High-Tech Diagnostic Imaging Scans at the Point-of-Order

Abstract

The use of high-tech diagnostic imaging (HTDI) procedures saw double-digit increases in the decade of the 2000s, prompting some health plans to institute prior authorization to ensure that only appropriate imaging scans were ordered to improve utilization rates. Prior authorization typically required providers to contact a radiology benefits management (RBM) vendor to approve the ordered scan before it could be rendered.

To address this trend, the Institute for Clinical Systems Improvement (ICSI) was approached by its medical group members and health plan sponsors to find a more patient-centered, cost-effective and immediate form of prior authorization. Following a pilot with five large medical groups, ICSI determined that an electronic decision-support approach to ordering HTDI scans offered a superior solution than RBM prior notification. As a result, an agreement was reached to offer this decision-support option to medical groups and hospital-based clinics across Minnesota.

ICSI facilitated the widespread use of RadPort™, a decision-support tool from Nuance Communications, in more than 100 organizations with over 6,000 physicians. However, as widespread implementation and use progressed, Nuance Communications announced it would be suspending sales of RadPort and would discontinue the product in February 2014. This came at the same time the Minnesota health care environment was evolving toward more risk sharing and shared savings contracts between medical groups and health plans. In response to these factors, further spread of this decision-support option was discontinued. Health plans and providers continue to support the use of clinical decision support for the ordering of high-tech imaging so ICSI has explored alternatives. Fortunately, the American College of Radiology (ACR) is enhancing and redesigning their appropriateness criteria to be licensed for use in electronic health record (EHR) systems or through a web based option.

The ICSI collaborative continues to support HTDI decision support by advising and advocating nationally for decision support to be embraced by the Centers for Medicare and Medicaid Services as the solution for imaging utilization management. ICSI is providing feedback to the ACR as they

offer and maintain a nationally available set of appropriateness criteria that will be made available through integration into EHRs, as a web-based option, or through decision- support vendors. This will provide a standard set of criteria to be used nationally.

Background

The use of high-tech diagnostic imaging (HTDI) procedures, which includes magnetic resonance imaging (MRI), computer tomography (CT), positron emission tomography (PET), and nuclear cardiology tests, has seen double-digit increases annually in the last decade. While remarkable technological advances in HTDI have enabled precise imaging of many complex physiologies and often ensure more accurate diagnostics, concerns have been raised that the sharp increase in quantity of tests rendered does not necessarily correspond proportionately to improved patient outcomes.

In a detailed review of HTDI growth and spending trends, America's Health Insurance Plans reported that the cost of diagnostic imaging has outpaced prescription drug costs, with health insurance plans' imaging costs growing by 18-20% annually versus a 6-8% increase in prescription drugs (1).

Factors frequently cited for the increased usage of HTDI scans nationally include: the rapid expansion of imaging centers (from 3,000 in 1999 to 5,760 in 2005); the acquisition or leasing of HTDI equipment by non-radiology clinics for in-office use; the increased use of diagnostic imaging for cancer care; demands by "worried-well" patients for preventive testing, and defensive medicine practiced by some physicians to ward off lawsuits (2-4). Possibly a full third of imaging procedures are inappropriate, costing the U.S. between \$3-\$10 billion annually (5).

The exposure to harmful radiation stemming from an increased usage of CT scans is also a concern. While in the majority of cases, diagnostic potential outweighs the risk, exposure to too much radiation, especially in children, is estimated to contribute to a low percentage (1.5-2%) of cancer deaths in the U.S. each year (6).

In an effort to ensure the appropriate use of HTDI scans and control costs, many health care purchasers and health plans nationally, as well as the Centers for Medicare and Medicaid Services (CMS), initiated or are considering initiating interventions such as prior notification. These processes usually require that the provider contact an RBM vendor to determine if a planned HTDI test such as an MRI, CT, PET, or nuclear cardiology scan is covered by insurance. While such RBM prior notification approaches have decreased the number of HTDI scans ordered, they are costly to implement and can contribute to provider inefficiencies as well as patient inconvenience and dissatisfaction. As a result, another option to prior notification was desired.

Minnesota Decision-Support Approach

Having seen annual usage of HTDI scans increase by 8% annually in Minnesota from 2003 to 2006, the Minnesota Department of Human Services (DHS) and Minnesota non-profit health plans were mandated by Minnesota legislature to institute prior notification programs for some imaging modalities to ensure quality and affordability of HTDI scans for public program recipients.

Several Minnesota health plans launched prior notification programs in 2007. While ensuring more appropriate diagnostic scans, the prior notification processes added expense and inefficiencies for both the patient and clinic, sometimes causing delays in testing, diagnosis and care. If a health plan's RBM firm denied a scan, the patient had to pay for the HTDI procedure out of pocket, or have the clinician order a different diagnostic imaging procedure and receive appropriate approval from the RBM. Likewise, both the clinic and health plan were burdened with additional administrative work and cost associated with processing the authorizations.

The Institute for Clinical Systems Improvement (ICSI), a nonprofit, independent quality improvement organization serving 50+ medical group and hospital members in Minnesota and surrounding areas, was requested by some of its members and sponsoring health plans to develop an electronic, more patient-centered option to RBM prior notification.

An ICSI HTDI Steering Committee, comprised of providers, health plans, radiologists and DHS, designed a one-year pilot to determine if medical groups could use standardized appropriateness criteria from the American College of Radiology (ACR) and other specialty organizations to order HTDI scans while with the patient, thereby foregoing participation in health plan RBM prior notification processes.

Additionally, the goals of the pilot were to:

- Improve the appropriateness of imaging orders, and provide quick/easy feedback to clinicians to help them order the right test for the patient's needs
- Present patients and physicians with the best clinical science available at decision time
- Establish outcomes reporting to correlate findings with the ICD9 code and exam type
- Develop an internal quality improvement effort based on utilization and appropriateness data (provider specific, aggregated by specialty, scan type and body part)
- Audit results and use that information to drive further improvements
- Use de-identified data and evidence to expand or revise HTDI appropriateness criteria.

Participating in the pilot were five medical groups (Allina Medical Center, Fairview Health Services, HealthPartners Medical Group, Park Nicollet Health Services, and Saint Mary's/Duluth Clinic Health System); four health plans (Blue Cross Blue Shield of Minnesota, HealthPartners Health Plan, Medica, and UCare); DHS, and St. Paul Radiology.

In the pilot, more than 4,500 providers agreed to use appropriateness criteria when ordering any of the top 90% of CT, MRI, PET and nuclear cardiology scan types done in Minnesota. The appropriateness criteria were either embedded into the organization's electronic health record (EHR) system or integrated into the HTDI ordering workflow through a web-based system. The five medical groups did not have to follow health plan RBM prior notification processes, as using the appropriateness criteria was seen as an electronic and immediate form of prior notification.

Pilot Results

One goal of the pilot was to determine if using the embedded appropriateness criteria delivered the level of decision support needed to provide a viable option to RBM prior notification. An audit of 300 charts was performed on a random sample of adult patients of a large medical group with primary care orders for three HTDI procedures—half six months before the EHR decision-support system was implemented and half six months afterward. The audits of orders for CT and MRI of the head and MRI of the lumbar spine used the same appropriateness criteria as were built into the EHR system. Combined results for the three procedures showed that a larger proportion (89.2 vs. 79.5%, $P = 0.02$) of tests ordered after implementing decision support fit appropriateness criteria.

Participating pilot medical groups accounted for about 47% of the claims submitted to the four major Minnesota health plans in 2007 while the other 53% were filed by medical groups complying with RBM prior notification processes instituted that year. The combined effect of RBM prior notification and the medical groups participating in the pilot was a 3% decrease in HTDI claims filed to the health plans compared to 2006 claims.

The pilot medical groups have since continued using decision support. That usage, plus RBM prior notification, has resulted in only a 1% growth in HTDI claims in Minnesota since 2007 (Chart 1). Based on the annual trajectory that HTDI scans had followed in the state since 2000, this combination was estimated to have saved Minnesota almost \$210 million. About \$150 million of that can be attributed to the decision-support approach.

The pilot showed that using decision support improved the utility of scans ordered, was more efficient and cost effective for providers and health plans, was more convenient and safe for patients, significantly lowered the number of inappropriate scans, and saved Minnesota millions of dollars. All five medical groups reported that the point-of-order decision support system is more efficient than contacting a RBM firm, has greater capacity for shared decision-making with patients, and can serve as a useful patient and provider education tool.

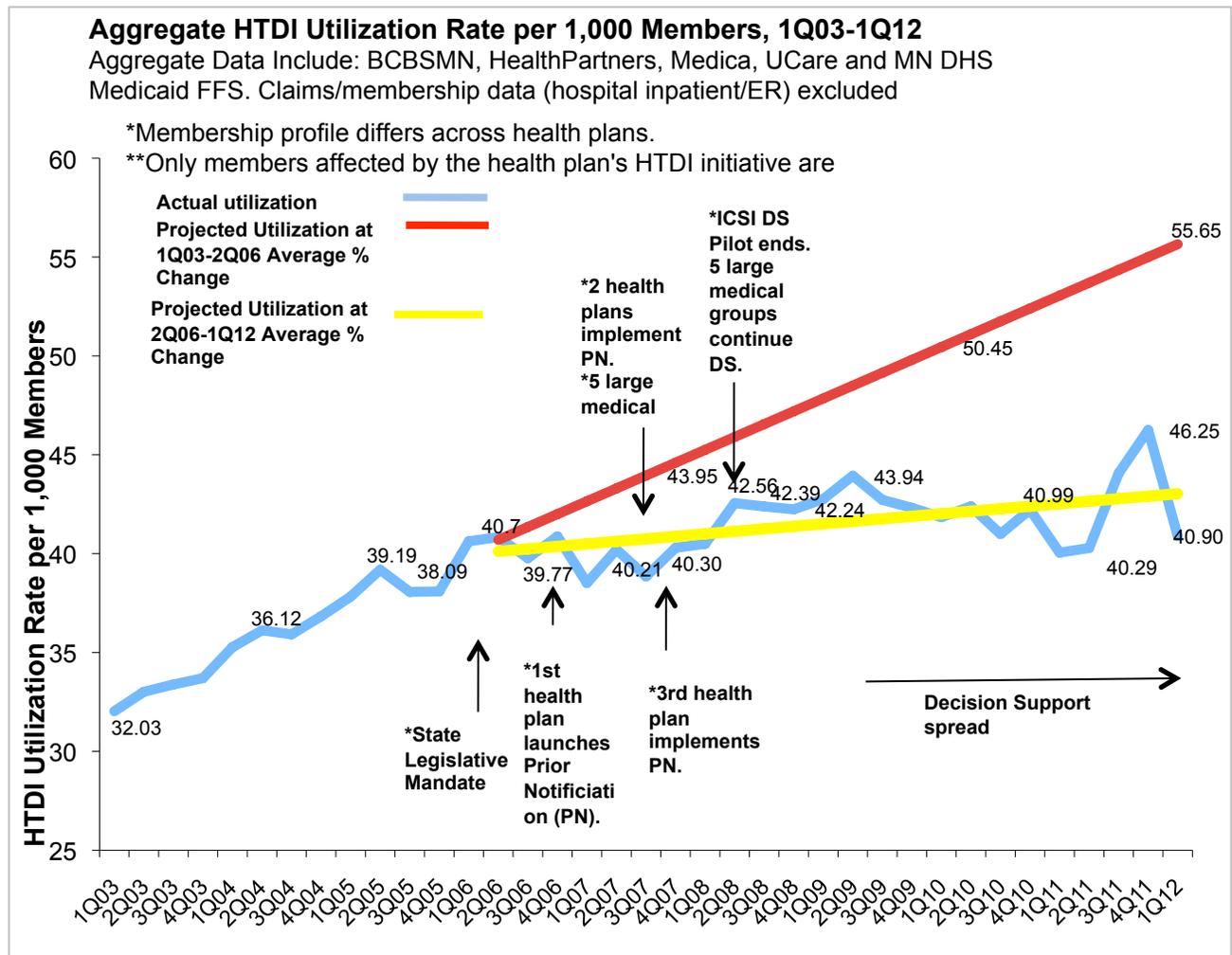


Chart 1. Trend line prior to/after introduction of prior notification and ICSI decision-support approach for ordering HTDI scans (not required to use RBM prior notification).

Post-Pilot Recommendations and Actions

Due to the positive results from the pilot and continued usage of decision support by the five medical groups, the ICSI HTDI steering committee set out to obtain a license for use of a common set of robust appropriateness criteria from a vendor that could be offered to medical groups and hospital-based clinics across Minnesota. It reviewed a number of national vendors, with the goal of being able to provide decision-support criteria either through an EHR or a secure Web site. The committee also sought a vendor solution that would allow for data analysis of physician HTDI orders with the goals of improving the diagnostic utility of scans ordered and ultimately linking those selections to improved patient outcomes.

The committee selected Nuance Communication to provide the appropriateness criteria and optional data analysis tool. The resultant ICSI decision-support option was designed to enable physicians to order appropriate HTDI scans real-time, with the patient present, as part of their normal workflow.

ICSI made this decision-support option available to all medical groups and hospital-based clinics in Minnesota in 2011.

Workflow

The vendor software tool included thousands of rule pairings for about 65% of CT, CTA, MR, MRA, PET, vascular ultrasounds and cardiac stress tests. Once the physician entered the patient's indications into the EHR, a screen fed back the utility of the order (the higher the score, the higher the utility or diagnostic value). If a selection was shown to be of low utility, the screen offered higher utility options based on the evidence. The physician could decide to select the higher utility option or continue with their original order, and was educated on making more appropriate selections over time. If desired the physician could share the data on the screen with the patient in order to explain why the particular scan was ordered.

The ICSI approach included the vendor's data warehouse tool to enable the analysis of data and provide feedback to organizations on their imaging order trends. Participating medical groups could analyze appropriateness of scans ordered by modality, body part, specialty, individual provider and location in order to improve usage and diagnoses over time.

ICSI had access to de-identified ordering data from the medical groups adopting the decision-support option. By analyzing this data through a collaborative, ICSI sought to assess how increasing the utility of test orders improved patient outcomes statewide, and then recommend new indications to the vendor. This process was designed to ensure that Minnesota providers have access to updated, robust, and evidence-based criteria for improving clinical outcomes.

Move Toward a National Model

This ICSI-led initiative was the first time that a common set of appropriateness criteria was offered to participating medical groups and hospital-based clinics on a statewide level. Extensive adoption of this option by Minnesota medical groups and hospital-based clinics was seen as enabling the state as a whole to standardize HTDI ordering practices based on evidence, and ultimately contribute to improved patient outcomes across a broad population.

As the statewide initiative progressed, however, Nuance indicated that it was suspending sales of its decision-support software product. While ICSI's broad scale implementation of the Nuance decision support tool has been discontinued, the ICSI collaborative, including medical groups, radiology providers and health plans, remain in full support of using decision support for high-tech diagnostic imaging.

ICSI continues to collaborate with the ACR, which is moving to deliver a comprehensive EHR integrated or web-enabled medical imaging clinical decision-support platform nationwide. ACR

contracted with the National Decision Support Company (NDSC) to provide the technical platform, support and licensing of its appropriateness criteria, ACR Select, nationwide. NDSC is working to integrate ACR Select into multiple EHRs and other decision-support solutions, thus offering a common set of appropriateness criteria nationally. ACR and NDSC intend to have the ACR Select decision-support solution available in 2013.

ICSI is supporting this effort by advising and advocating nationally for decision support to be embraced by CMS as the solution for Medicare and Medicaid imaging utilization management. ICSI is providing feedback to the ACR as they offer and maintain a nationally available set of appropriateness criteria. ICSI will also continue to collect health plan data and provide aggregate reporting on utilization trends to ensure that Minnesota maintains the gains reaped from implementing decision support to date.

Footnotes

1. America's Health Insurance Plans (AHIP), Ensuring Quality through Appropriate Use of Diagnostic Imaging, July 2008.
2. Farr C. Oncologic Imaging Growth Forecast for Cancer Management Fundamentals. Imaging Economics, November 2006.
3. Baker L, Birnbaum H, Geppert J, et al. The Relationship Between Technology Availability and Health Care Spending. Health Affairs-Web Exclusive. Nov. 5, 2003.
4. Studdert D, Mello M, Sage W, et al. Defensive Medicine Among High-Risk Specialist Physicians in a Volatile Malpractice Environment, JAMA. 2005;293(21):2609-2617.
5. Stein C. Code Red Partners Program Aims to Rein in Skyrocketing Costs of Diagnostic Imaging, Boston Globe. June 27, 2003.
6. Brenner DJ, Hall EJ. Computed Tomography—An Increasing Source of Radiation Exposure, N Engl J Med, No. 22, 357:2277-2284, Nov. 29, 2007
7. Bershow B, Courneya P and Vinz C. Decision-Support for More Appropriate Ordering of High-Tech Diagnostic Imaging Scans. ICSI Colloquium on Health Care Improvement, May 2009.

