Clinical Decision Support for Outpatient High-Cost Radiology Ordering in the United States

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Sector(s): Health

Location: New York, NY, USA

Sample: Approximately 2,030 outpatient physicians affiliated with Mount Sinai Queens or Mount Sinai Hospital

Target group: Health care providers

Outcome of interest: Service provider performance

Intervention type: Digital and mobile Health care delivery

AEA RCT registration number: AEARCTR-0000905

Partner organization(s): Mount Sinai Health System, Arnold Ventures

There is widespread concern that inappropriate medical imaging unnecessarily increases health care costs and exposes patients to avoidable radiation. In response, clinical decision support systems have been designed to notify physicians when they have ordered a diagnostic scan that is inconsistent with current professional guidelines. Researchers were studying the impact of a clinical decision support system on the ordering of high-cost scans, but the study is no longer viable.

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In 2012, Medicare spent US$10 billion on high-cost diagnostic scans, such as magnetic resonance imaging (MRI) and computed tomography (CT) scans, but research suggests that up to 30 percent of diagnostic imaging is unnecessary. These scans may also expose patients to potentially harmful radiation. With health care spending accounting for almost one-fifth of the U.S. economy and an even larger share of public sector budgets, policymakers have great interest in reducing spending on health care that provides minimal value to patients. Reflecting concerns about inappropriate scanning, beginning in 2017, Medicare will no longer reimburse providers for high-cost scans unless they are ordered using a qualifying clinical decision support system – an automated tool that provides guidance on the appropriateness of a scan. To date, there has been no randomized evaluation of the impact of clinical decision support systems for imaging.

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Mount Sinai Health System is an integrated health care system providing medical care in the New York City metropolitan area. Acclaimed internationally for its excellence in research, patient care, and education across a range of specialties, Mount Sinai encompasses a medical school, seven hospital campuses, and numerous ambulatory care centers in the region. The physicians participating in this study are outpatient physicians affiliated with two of the seven Mount Sinai hospitals – Mount Sinai Hospital in Manhattan and Mount Sinai Queens. Prior to the study, Mount Sinai already had clinical decision support systems in place in its inpatient and emergency room settings.



A patient undergoing a scan.

Samuel Gabriel from Pixabay

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Researchers are conducting a randomized evaluation to study the impact of clinical decision support systems on the ordering of certain high-cost medical imaging scans. For the study, Mount Sinai identified approximately 2,030 outpatient physicians affiliated with Mount Sinai Hospital in Manhattan and Mount Sinai Queens. In October 2015, researchers randomly selected about half of these physicians to receive the clinical decision support intervention, with the other half serving as a control group.

The clinical decision support system is integrated directly into Mount Sinai's electronic medical record and operates when a physician orders a high-cost imaging scan. Based on the health condition that the physician enters as the reason for the scan, and on characteristics of the patient, the system uses computerized guidelines developed by the American College of Radiology to determine the appropriateness of the scan. If the scan is rated "may be appropriate" and there is another higher-rated scan available, or if the scan is rated "usually not appropriate," a pop-up window appears at physician sign-off listing the

appropriateness rating of the selected scan as well as more appropriate scan options, with a link to the relevant medical documentation. The physician can choose to either cancel the initial order, order a substitute scan, or proceed with the initially selected scan. Prior to the introduction of the clinical decision support system, researchers estimated that approximately one-third of orders would trigger a pop-up alert.

Researchers will measure scan ordering through administrative data recorded by Mount Sinai's electronic medical records system and by the provider of the clinical decision support system. Researchers also hope to study the impact of the intervention on patients' subsequent medical care through other administrative data sources.

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Providers at Mount Sinai were to be randomized into a treatment group that would receive clinical decision support and a control group that would not. Due to an error in the implementation of the project, clinical decision support was provided to all providers. The researchers did not think there was sufficient scientific merit to pursue a randomized evaluation in this setting. All research activities at the Mount Sinai site were terminated in May 2016.