Effect of a Price Transparency Intervention in the Electronic Health Record on Clinician Ordering of Inpatient Laboratory Tests

Mina S. Sedrak
Jennifer S. Myers
*University of Pennsylvania*, jennifer.myers@uphs.upenn.edu

Dylan Small
*University of Pennsylvania*, dsmall@wharton.upenn.edu

Irving Nachamkin
*University of Pennsylvania*, NACHAMKI@MAIL.MED.UPENN.EDU

Justin B. Ziemba
*University of Pennsylvania*, justin.ziemba@gmail.com

Follow this and additional works at: https://repository.upenn.edu/ldi_researchbriefs

Sedrak, Mina S.; Myers, Jennifer S.; Small, Dylan; Nachamkin, Irving; Ziemba, Justin B.; Murray, Dana; Kurtzman, Gregory W.; Zhu, Jingsan; Wang, Wenli; Mincarelli, Deborah; Danoski, Daniel; Wells, Brian P.; Berns, Jeffrey S.; Brennan, Patrick J.; Hanson, C. William; Dine, Jessica; and Patel, Mitesh S.. Effect of a Price Transparency Intervention in the Electronic Health Record on Clinician Ordering of Inpatient Laboratory Tests. LDI Research Briefs. 2017; No. 26. https://ldi.upenn.edu/brief/effect-price-transparency-intervention-electronic-health-record-clinician-ordering-inpatient

LDI briefs are produced by LDI's policy team. For more information please contact Janet Weiner at weinerja@mail.med.upenn.edu.

This paper is posted at ScholarlyCommons. https://repository.upenn.edu/ldi_researchbriefs/26
For more information, please contact repository@pobox.upenn.edu.
Effect of a Price Transparency Intervention in the Electronic Health Record on Clinician Ordering of Inpatient Laboratory Tests

Keywords
price, price transparency, laboratory tests

Disciplines
Health Economics

Comments
LDI briefs are produced by LDI’s policy team. For more information please contact Janet Weiner at weinerja@mail.med.upenn.edu.

License
This work is licensed under a Creative Commons Attribution-No Derivative Works 4.0 License.

Author(s)
Mina S. Sedrak, Jennifer S. Myers, Dylan Small, Irving Nachamkin, Justin B. Ziemba, Dana Murray, Gregory W. Kurtzman, Jingsan Zhu, Wenli Wang, Deborah Mincarelli, Daniel Danoski, Brian P. Wells, Jeffrey S. Berns, Patrick J. Brennan, C. William Hanson, Jessica Dine, and Mitesh S. Patel

This brief is available at ScholarlyCommons: https://repository.upenn.edu/ldi_researchbriefs/26
EFFECT OF A PRICE TRANSPARENCY INTERVENTION IN THE ELECTRONIC HEALTH RECORD ON CLINICIAN ORDERING OF INPATIENT LABORATORY TESTS

Mina S. Sedrak, Jennifer S. Myers, Dylan S. Small, Irving Nachamkin, Justin B. Ziemba, Dana Murray, Gregory W. Kurtzman, Jingsan Zhu, Wenli Wang, Deborah Mincarelli, Daniel Danoski, Brian P. Wells, Jeffrey S. Berns, Patrick J. Brennan, C. William Hanson, Jessica Dine, Mitesh S. Patel

JAMA Internal Medicine, April 2017

KEY FINDINGS
Despite the promise of price transparency, clinicians did not change their ordering of inpatient lab tests when Medicare allowable fees were displayed in the electronic health record at the time of order entry.

THE QUESTION
With estimates that nearly 30% of laboratory testing in the United States is wasteful, health systems are considering making clinicians more aware of the costs of the tests they order. Price transparency, at the time of ordering, may encourage clinicians to consider the cost of their decisions.

This study sought to answer the question: if clinicians knew the cost of the tests they order in the hospital, would they change their ordering behavior?

THE STUDY
This year-long randomized clinical trial was conducted at three hospitals within the University of Pennsylvania Health System in Philadelphia. It analyzed the ordering practices of physicians, nurse practitioners, and physician assistants, but did not differentiate between these clinicians.

The analysis included a one-year pre-intervention period and a one-year intervention period. The authors randomized 60 lab tests to two groups: one that displayed Medicare allowable fees at the time of order and the other that did not.

The primary outcome was the number of tests ordered per patient-day, after adjusting for patient characteristics and other variables. The authors also looked at the associated fees per patient-day.

The research team conducted subgroup comparisons of differences in ordering behavior for patients with varying comorbidities, for those who had an intensive care unit (ICU) stay, and for tests from the highest and lowest cost brackets.

THE FINDINGS
The mean number of tests per patient day did not change significantly in the intervention group compared to the control group over time. As shown, the mean number of tests ordered per patient-day remained virtually unchanged in both the intervention and control group. Even after

| UNADJUSTED NUMBER OF INPATIENT LABORATORY TESTS ORDERED PER PATIENT-DAY BY GROUP AND MONTH |

Source: Sedrak et al., JAMA Internal Medicine.
adjusting for other factors, there was no significant change in the mean number of tests ordered or mean fees attributable to the intervention. In subanalyses, the authors found a relative decrease in test ordering for patients with an ICU stay and a relative increase for patients without an ICU stay, and relative decrease in test ordering of tests in the top-quartile of fees and a relative increase of tests in the bottom-quartile of fees.

**THE IMPLICATIONS**

Prior evidence has been inconsistent on the effectiveness of price transparency as a way to influence medical decision-making. This study provides further evidence that price transparency, by itself, is not likely to reduce ordering of wasteful tests in the hospital.

A number of explanations may account for these findings and point the way toward more effective interventions. First, the allowable fees in the intervention were displayed regardless of the clinical scenario. The presence of this information for appropriate tests may have diminished its impact when tests were inappropriate. Future efforts might target price transparency more selectively.

Second, the intervention might have had reduced salience because it did not consider clinician practice habits. In a qualitative analysis at one of the hospital sites, 91% of resident physicians reported that unnecessary lab testing was due to the habit of entering repeating daily lab test orders on the patient’s first day of admission. If repeating orders were entered at admission, the clinician would not need to place another order and thus would not be presented with price transparency information when it would be most salient. This might explain the effects of the intervention when patients had an ICU stay. Because health care decisions are changing more rapidly in this setting, clinicians may be less likely to rely on repeating orders and therefore may have been exposed to the intervention more often. Pairing price transparency information with interventions reducing the use of repeating test orders could address this problem.

Third, clinicians’ prior beliefs about costs of each test might influence the effectiveness of the intervention. Clinicians may have previously believed that the cost of some tests was higher or lower than the displayed price. This could explain the small but significant decrease in ordering for the most expensive tests and the small but significant increase in ordering for the least expensive tests. Other ways to frame price transparency, such as comparisons of differences in price between options, using other forms of price, such as charges, or targeting only more expensive tests, may be needed.


**ABOUT LDI**

Since 1967, the Leonard Davis Institute of Health Economics (LDI) has been the leading university institute dedicated to data-driven, policy-focused research that improves our nation’s health and health care. Originally founded to bridge the gap between scholars in business (Wharton) and medicine at the University of Pennsylvania, LDI now connects all of Penn’s schools and the Children’s Hospital of Philadelphia through its more than 250 Senior Fellows.

LDI Research Briefs are produced by LDI’s policy team. For more information please contact Janet Weiner at weinerja@mail.med.upenn.edu.

---

**LEAD AUTHORS**

**DR. MINA SEDRAK**

Mina S. Sedrak, MD, MS is an Assistant Professor at City of Hope cancer center. He completed a Master of Science degree in Health Policy Research from Perelman School of Medicine at the University of Pennsylvania. His research focuses on studying the mechanisms by which social media and mobile technology can enhance individual and population health behaviors and outcomes in oncology.

**DR. MITESH PATEL**

Mitesh S. Patel, MD, MBA, MS is an Assistant Professor of Medicine and Health Care Management at the Perelman School of Medicine and the Wharton School at the University of Pennsylvania. He is a Staff Physician at the Crescenz VA Medical Center in Philadelphia. His research focuses on studying innovative ways to change health behaviors and improve health outcomes by combining digital health approaches that collect data using wireless and wearable devices with engagement strategies that leverage insights from behavioral economics. As Director of the Penn Medicine Nudge Unit, he leads an initiative within the health care system to systematically test ways to apply insights from behavioral science to choice environments to improve health care value and outcomes.