

Emergency Department Switching and Duplicate Computed Tomography Scans in Patients With Kidney Stones

Parth K. Shah, Phyllis L. Yan, Casey A. Dauw, Brent K. Hollenbeck, Khurshid R. Ghani, Amy N. Luckenbaugh, and John M. Hollingsworth

OBJECTIVE	To test whether duplicate imaging relates to a lack of information sharing among providers, we measured the association between emergency department (ED) switching during a kidney stone episode and receipt of a repeat computed tomography (CT) scan.
METHODS	Using the MarketScan Commercial Claims and Encounters Database, we identified adults between the ages 18 and 64 with an ED visit for a diagnosis of kidney stones. Among patients who had an abdominal or pelvic CT scan at their initial encounter, we then determined the subset that made an ED revisit within 30 days of their first, distinguishing between those to the same vs a different ED. Finally, we fit multivariable logistic regression models to estimate the risk of receiving a repeat CT scan associated with ED switching.
RESULTS	Twelve percent of patients who received a CT scan at their initial ED encounter had a revisit within 30 days of discharge. One-third of their revisits were made to a different ED than the index one. Duplicate CT scans were obtained at nearly 40% of all revisits. On multivariable analysis, the risk of receiving a repeat CT was 12% higher if this revisit was made to a different ED (risk ratio, 1.12; 95% confidence interval, 1.03-1.21; $P = .010$).
CONCLUSION	Our study reveals that ED switching during an acute kidney stone episode is associated with higher levels of repeat CT imaging. These findings support the role of better health information exchange among providers to help reduce waste in the health-care system. UROLOGY ■■: ■■-■■, 2018. © 2018 Elsevier Inc.

Expenditures made by Americans on health care total \$3.3 trillion annually, accounting for 17.9% of the gross domestic product.¹ Although health-care spending growth has slowed significantly, the United States still pays more than any other nation in the world for health care.² Forty to 50% of this spending is considered waste—a substantial portion of which can be explained by the high prevalence of duplicate (sometimes unnecessary) medical imaging.³ Thus, efforts to limit duplicate imaging may go a long way toward reducing health-care spending.⁴

To limit duplicate imaging, a better understanding of its causes is needed. Known causes include patient demand, defensive medicine, and fee-for-service reimbursement.⁵ Another potential cause that has been incompletely ex-

plored relates to failures of care coordination. During an episode of care, patients must often visit multiple, sometimes competing, providers dispersed across locations over time. If information is not shared among these providers, they may fail to see the full clinical picture and inadvertently order duplicate imaging.⁶

In this context, we analyzed claims data from privately insured adults with an emergency department (ED) visit for kidney stones. Among those who underwent a computed tomography (CT) scan at their initial evaluation, we determined the subset that had an ED revisit within 30 days of their first. We then measured the frequency of CT use during these revisits, distinguishing between revisits to the same vs a different ED. Our study will provide clinician leaders with actionable insights as they refine systems for sharing information sharing across care locations.

Financial Disclosure: The authors declare that they have no relevant financial interests.

Funding support: This study was supported by the National Institute on Aging (R01AG048071 to Brent K. Hollenbeck) and the Agency for Healthcare Research and Quality (1R01HS024525 01A1 and 1R01 HS024728 01 to John M. Hollingsworth).

From the Department of Urology, Dow Division of Health Services Research, University of Michigan Medical School, Ann Arbor, MI

Address correspondence to: John M. Hollingsworth, M.D., M.S., University of Michigan Medical School, 2800 Plymouth Road, Building 16, 1st Floor, Room 112W, Ann Arbor, MI 48109-2800. E-mail: kinks@med.umich.edu

Submitted: November 15, 2017, accepted (with revisions): January 10, 2018

MATERIALS AND METHODS

For our study, we used Truven Health Analytics' MarketScan Commercial Claims and Encounters Database (2003-2006). This database captures medical and pharmacy claims data from working age adults with employer-sponsored insurance and their dependents.

To begin, we used an *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD-9) diagnosis code-based algorithm to identify beneficiaries between the 18 and 64-year-olds, for whom an ED claim for kidney stones was submitted on their behalf.⁷ Because we were interested in incident stone episodes, we required that beneficiaries had a clean 90-day window with no other claims for kidney stones prior to their index ED visit. To be able to follow beneficiaries over their stone episodes, we required continuous enrollment in a benefit plan for 30 days after their index ED visit.

Next, we used appropriate ICD-9 procedure codes and *Current Procedural Terminology* codes to determine which beneficiaries received a CT scan of the abdomen or pelvis during their index ED visit. Among these beneficiaries, we came up with another subset to distinguish those with an ED revisit for kidney stones within 30 days of their index visit. We excluded those who underwent kidney stone surgery between their ED visits.

Exposure Assessment

To differentiate between revisits to the same vs a different ED, we used unique facility identifiers (IDs) to assign each visit to the facility associated with the plurality of claims on the visit date in question. For ED visits resulting in a hospitalization, we considered claims between the admission and discharge dates, and for outpatient ED visits, we examined claims filed within a 24-hour window around the visit date. To remove noise from our data, we only excluded unique facility IDs that were linked to different ZIP codes during the study period.

Outcome Measures

Our primary outcome was receipt of duplicate imaging. Consistent with the previous literature,^{8,9} we said that a beneficiary received duplicate imaging if he or she underwent a CT scan on the same body part (ie, abdomen or pelvis) at both his or her index and repeat ED visits.

Our secondary outcome was receipt of a duplicate narcotic prescription. To determine whether this occurred, we used appropriate National Drug Codes to identify prescription fills for narcotic analgesics at both the index and repeat ED visits. Given the existence of prescription drug monitoring programs, our a priori hypothesis was that the rate of duplicate narcotic prescription was less susceptible to ED switching.¹⁰

Statistical Analysis

For our initial analytic step, we characterized imaging use at the index ED visit for kidney stones. Among those beneficiaries who

received imaging, we classified the type: CT, x-ray radiography, ultrasonography, or intravenous pyelography.

For the subset of beneficiaries who underwent CT imaging and then had an ED revisit, we then made bivariate comparisons between those with visits to the same vs a different ED, using parametric and nonparametric tests where appropriate. Specifically, we compared patients with respect to their age, gender, employee classification (salaried vs nonsalaried), employment status (full- vs part-time), benefit plan type (comprehensive, preferred provider organization, health maintenance organization, point-of-service plan, or other), urban vs rural location, level of comorbidity (using a modified version of the Charlson index¹¹), and region of residence (Northeast, Midwest, South, or West).

Finally, we used multivariate logistic regression to estimate the association between ED switching and the receipt of duplicate imaging and narcotic prescription, controlling for those sociodemographic and comorbid disease factors described above. To account for the correlation in our data (patients nested within facilities), we calculated robust standard errors using the Huber-White sandwich estimator.¹² We used methods described by Zhang and Yu to approximate a risk ratio (RR) from the adjusted odds ratio.¹³

We performed 2-sided significance testing and set a type-I error rate at 0.05. All analyses were done using SAS software, version 9.4 (SAS Institute Inc., Cary, NC). The University of Michigan's Health Sciences Institutional Review Board deemed that this study was exempt from its oversight.

RESULTS

In total, we identified 166,639 beneficiaries with an ED visit for kidney stones over the study interval. More than 86% of them received some sort of medical imaging during their index visit. CT was used most commonly (77.9% of visits), followed by x-ray (22.3%), intravenous pyelography (13.6%), and ultrasonography (4.2%) (Fig. 1). Narcotics were prescribed at almost half (49.1%) of index visits.

Nearly 1 in 7 of beneficiaries (13.5%) had an ED revisit for kidney stones within 30 days of their first. Seventy-one percent of them had CT imaging at their index visit. For the subset of these beneficiaries who did not undergo stone-directed surgery between visits and where there was reliable reporting of the ED facility IDs in their claims ($n = 3818$), over one-third (36.5%) presented to a differ-

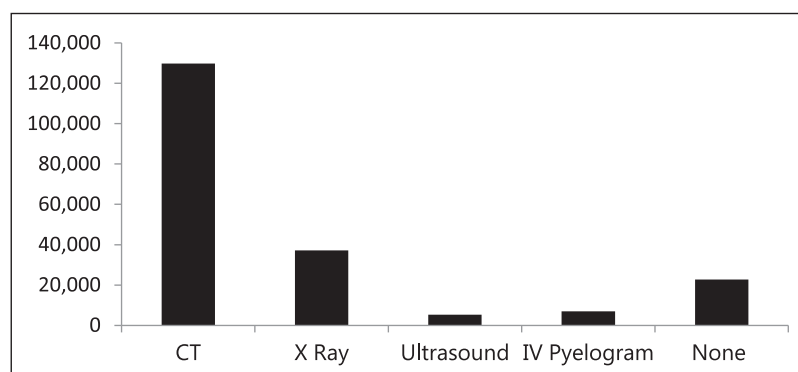


Figure 1. Types of imaging studies obtained at the index ED visit. Abbreviations: CT, computed tomography; ED, emergency department; IV, intravenous.

Download English Version:

<https://daneshyari.com/en/article/8775751>

Download Persian Version:

<https://daneshyari.com/article/8775751>

[Daneshyari.com](https://daneshyari.com)