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# Trends in Follow-Up of Patients Presenting to the Emergency Department with Symptomatic Cholelithiasis



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- BACKGROUND:** Fewer than 25% of Medicare beneficiaries presenting with symptomatic cholelithiasis undergo elective cholecystectomy. To better understand underuse of cholecystectomy, we examined physician follow-up patterns after emergency department (ED) visits for symptomatic gallstones.
- STUDY DESIGN:** We used 100% Texas Medicare claims (2001 to 2010) to identify patients 66 years of age and older who presented to the ED with symptomatic cholelithiasis and were discharged home without cholecystectomy. Timing of outpatient physician visits after ED discharge and rates of emergent cholecystectomy based on physician follow-up patterns were compared.
- RESULTS:** In total, 11,126 patients presented to the ED with symptomatic cholelithiasis and were discharged without cholecystectomy. After discharge, 5,327 patients (47.9%) had an outpatient surgeon visit, 29.0% saw another physician and never saw a surgeon, and 23.1% never saw a physician; 68.2% of patients who saw a surgeon underwent elective cholecystectomy; and 8.3% of patients who saw a surgeon, 14.6% of patients who saw other physicians and no surgeon, and 77.6% of patients who never saw any physician, required emergent hospitalization ( $p < 0.0001$ ). For people who did not see a physician, mean time to emergent hospitalization was 7.5 days (median 2 days); 95.9% presented within 2 weeks after their initial presentation.
- CONCLUSIONS:** Fewer than half of patients were evaluated by a surgeon after an initial ED visit for symptomatic gallstones. Patients who did not have physician follow-up were most likely to require emergent cholecystectomy, suggesting inappropriate ED discharge and highlighting the need for timely follow-up. Early outpatient surgical consultation is critical in determining appropriateness for cholecystectomy and avoiding emergent cholecystectomy in older patients with symptomatic gallstones. (J Am Coll Surg 2016;222:377–384. © 2016 by the American College of Surgeons. Published by Elsevier Inc. All rights reserved.)
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Prevalence of gallstone disease increases with age. Twenty to thirty percent of people aged older than 60 years have gallstones,<sup>1,2</sup> and up to 80% of institutionalized patients older than 90 years have been found to have gallstones.<sup>3</sup> Guidelines developed by the Society of American Gastrointestinal and Endoscopic Surgeons recommend elective cholecystectomy for patients with symptomatic gallstone disease, with few absolute or relative contraindications.<sup>4</sup> Despite these guidelines and the increasing prevalence of gallstones in the elderly population, older patients are less likely to undergo definitive treatment with cholecystectomy.<sup>5,6</sup> Previous work by our group demonstrated that <25% of Medicare beneficiaries undergo elective cholecystectomy for gallstone disease.<sup>7</sup> In addition, receipt of cholecystectomy was independent of a patient's risk of gallstone-related complications developing.<sup>7,8</sup>

Consequently, older patients are more likely to present with complicated gallstone disease, including gallbladder perforation, gangrenous cholecystitis, and emphysematous cholecystitis.<sup>9,10</sup> Once these complications occur in the elderly, mortality and morbidity increase dramatically.<sup>8,11-13</sup> The reluctance to perform elective cholecystectomy in elderly patients is likely multifactorial and includes concerns about increased morbidity, mortality, and length of hospital stay due to the comorbidities and frailty commonly seen in this population.<sup>14,15</sup> In addition, it is difficult for physicians to predict the risk of gallstone-related complications developing and balance this risk with operative risk at the time of decision making. However, studies have shown that laparoscopic cholecystectomy is a safe procedure in this subset of patients, despite slightly increased lengths of stay and increased conversion to open procedures.<sup>12,16,17</sup>

Based on the previously developed PREOP-Gallstones risk prediction model,<sup>8</sup> patients who presented to the emergency department (ED) for their initial episode of symptomatic cholelithiasis and were sent home without a cholecystectomy were at high risk for future gallstone-related complications.<sup>7</sup> The objective of our study was to better understand the underuse of elective cholecystectomy in these high-risk older patients seen in an ED for their gallstones by examining physician follow-up patterns after a patient's initial presentation to the ED with a symptomatic episode. Patient outcomes were compared based on physician follow-up patterns.

## METHODS

The study was reviewed by the IRB at the University of Texas Medical Branch, Galveston, TX. As the study involved analysis of secondary data, it was not considered human subjects research and was granted exemption.

### Data source

This study used enrollment and claims data for 100% of Texas Medicare beneficiaries from 2001 to 2010. Demographic and enrollment data were obtained from the Denominator file. The Medicare Provider Analysis and Review file was used to obtain inpatient hospital admission claims. Outpatient claims and claims submitted by non-institutional providers were obtained from the Outpatient Standard Analytic File and Carrier Standard Analytic File.

### Cohort selection

We identified all patients who presented to the ED with symptomatic cholelithiasis and were discharged without

admission or cholecystectomy.<sup>18</sup> We used the following inclusion criteria to derive the study cohort (Fig. 1): patients with symptomatic gallstone disease identified using ICD-9 codes (Table 1); aged 66 years and older; seen in the ED for their initial visit; did not require hospital admission and/or cholecystectomy (identified using CPT codes; Table 1); and continuously enrolled in Medicare Part A and Part B for at least 12 months before and 2 years after the first ED visit, without HMO coverage.

### Identifying physician follow-up patterns

Using Evaluation and Management codes, physician outpatient visits were identified from the Outpatient Standard Analytic File or Carrier Standard Analytic File (Table 1). Physicians were classified as surgeons, primary care physicians (PCP), and other physician specialties. We evaluated the trajectory of care by examining physician visits, subsequent elective cholecystectomy, emergent hospital admission, and emergent cholecystectomy in the 2 years after ED discharge. A patient was considered to have had an elective cholecystectomy if evaluated by a surgeon on an outpatient basis or underwent elective cholecystectomy; if a patient had a code for elective cholecystectomy but did not have an Evaluation and Management code for a surgeon visit, they were classified as having seen a surgeon, because only elective operations can be done if scheduled with a surgeon. Patients without an Evaluation and Management code were identified as having no outpatient physician follow-up.

### Outcomes

We evaluated rates of elective or emergent/urgent cholecystectomy rates in patients who were seen by a surgeon (either initially or after seeing a PCP or other specialist), seen by a PCP or other physician only, and not seen by a physician in the outpatient setting using ICD-9 and CPT procedure codes (Table 1). Hospital admission patterns for gallstone-related complications were also identified within the 3 physician categories described. Rates of cholecystectomy and hospital admission were compared among physician categories. Postoperative complications and 30-day mortality rates were identified and compared in patients who underwent elective vs emergent cholecystectomy.

### Statistical analysis

Descriptive statistics were done to compare patients who were evaluated by a surgeon with those who were not. Chi-square and *t*-tests were done to compare categorical and continuous variables, respectively.

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