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Contributions



## ARE GERIATRIC PATIENTS PLACED IN AN EMERGENCY DEPARTMENT OBSERVATION UNIT ON A CHEST PAIN PATHWAY MORE LIKELY THAN NON-GERIATRIC PATIENTS TO RE-PRESENT TO THE HOSPITAL WITHIN 30 DAYS?

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**Abstract—Background:** Emergency department observation units (EDOUs) are used frequently for low-risk chest pain evaluations. **Objective:** The purpose of this study was to determine whether geriatric compared to non-geriatric patients evaluated in an EDU for chest pain have differences in unscheduled 30-day re-presentation, length of stay (LOS), and use of stress testing. **Methods:** We conducted an exploratory, retrospective, cohort study at a single academic, urban ED of all adult patients placed in an EDU chest pain protocol from June 1, 2014 to May 31, 2015. Our primary outcome was any unscheduled return visits within 30 days of discharge from the EDU. Secondary outcomes included EDU LOS and stress testing. We used Wilcoxon non-parametric and  $\chi^2$  tests to compare geriatric to non-geriatric patients. **Results:** There were 959 unique EDU placements of geriatric ( $n = 219$ ) and non-geriatric ( $n = 740$ ) patients. Geriatric compared to non-geriatric patients had: no significant difference in unscheduled 30-day return visits after discharge from the EDU (15.5% vs. 18.5%;  $p = 0.31$ ); significantly longer median EDU LOS (22.1 vs. 20.6 h;  $p < 0.01$ ) with a greater percentage staying longer than 24 h (42% vs. 29.1%;  $p < 0.01$ ). Geriatric patients had significantly fewer stress tests (39.7% vs. 51.4%;  $p < 0.01$ ), more of which were nuclear stress tests (78.2%

vs. 39.5%;  $p < 0.01$ ). **Conclusions:** In this exploratory retrospective study, geriatric EDU chest pain patients did not have an increased rate of re-presentation to the hospital within 30 days compared to non-geriatric patients. Geriatric patients had a longer EDU LOS than non-geriatric patients. Geriatric patients in the EDU had fewer stress tests, but more of those were nuclear stress tests. © 2017 Elsevier Inc. All rights reserved.

**Keywords—**geriatric patients; emergency department observation unit; EDU; chest pain; 30-day return visits; length of stay; LOS; stress testing; coronary artery disease; CAD

### INTRODUCTION

The use of emergency department observation units (EDOUs) has increased dramatically over the past 10 years (1). As of 2012, one-third of hospitals in the United States have opened an EDU for caring for patients with a variety of clinical conditions (2). Chest pain is the most common problem for which patients are placed in an EDU (1,3).

Patients placed in an EDU are generally expected to be discharged within 24 h (4). Standard chest pain protocols in EDOUs have been shown to reduce length of stay (LOS) and cost of caring for chest pain patients (4,5).

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Geriatric patients (age  $\geq 65$  years) placed in EDOUs have been reported to have a higher rate of hospital admission than their younger counterparts (6). Patients with known coronary artery disease (CAD) are also more likely to require admission after being placed in EDOUs (7).

A study by Madsen et al, published in 2008, reported that properly screened (those without a history of CAD) geriatric patients may be appropriate for chest pain evaluation in an EDOU (8). The purpose of this study was to compare the rate of 30-day return visits, LOS, and use of stress testing in geriatric and non-geriatric patients (including patients with history of CAD) placed in the EDOU at our hospital.

## METHODS

This study was conducted at an urban, academic ED that sees approximately 120,000 patients annually. A retrospective, cohort design was used to examine patients evaluated in the EDOU under a chest pain protocol from June 1, 2014 to May 31, 2015. These medical records were electronically queried through the hospital's clinical data warehouse. Inclusion criteria for admission to the EDOU under the chest pain protocol at our institution were history of chest pain, vital signs in acceptable limits, electrocardiogram without acute ischemic changes, initial cardiac markers within normal range, resolving chest pain, potential to discharge in < 24 h, able to give consent, and i.v. access. Patients were excluded from this protocol for any of the following: acute myocardial infarction or unstable angina, hemodynamic instability, new atrial fibrillation or other cardiac dysrhythmia, obvious alternative diagnosis, cocaine use in past 12 h, any cardiac revascularization procedures (e.g., percutaneous coronary intervention and coronary artery bypass grafting) within previous 12 months, active psychiatric disease, fever > 101°F, or weight > 350 lb. If a patient was placed in the EDOU more than one time within the study time frame, the subsequent visit(s) was

analyzed as an unscheduled return visit, but was excluded from counting as a unique EDOU presentation.

We compared patients  $\geq 65$  years of age or older (geriatric) to those < 65 years of age (non-geriatric) who went through the EDOU chest pain pathway on several outcomes. Our primary outcome was unscheduled return visit to ED within 30 days of discharge from the EDOU (9). Secondary outcomes included EDOU LOS, stress test frequency, and type of stress test used. We measured EDOU LOS as a continuous and dichotomous variable (>24 h vs.  $\leq 24$  h). Basic demographic information was analyzed to compare geriatric to non-geriatric patients (Table 1). No sample size calculations were done beforehand, as this was an exploratory and retrospective analysis. We performed Wilcoxon rank-sum test to compare non-normal continuous variables and  $\chi^2$  tests to compare categorical outcomes (Table 2). The  $\alpha$  was set at 0.05. Because return to ED within 30 days was the primary outcome, with the other outcomes secondary, no correction was made for multiple comparisons.

We used SAS software, version 9.3 (SAS Institute, Cary, NC) for all data analysis. The Boston University Medical Campus Institutional Review Board approved this study.

## RESULTS

There were 959 unique patient visits to the EDOU on the chest pain pathway during the study observation period. Of those visits, 219 were geriatric patients with a median age of 72.0 (interquartile range [IQR] 9.0) years and 740 were non-geriatric patients with a median age of 52.0 (IQR 12.0) years (Table 1).

Thirty-four patients in the geriatric group and 137 patients in the non-geriatric group re-presented to the ED within 30 days of discharge from the EDOU. There was no significant difference in the number of unscheduled 30-day return visits between geriatric and non-geriatric patients, with a rate of return of 15.5% versus 18.5%, respectively (15.5%; 95% confidence interval [CI]

**Table 1. Demographic Characteristics of Patients**

Characteristic	Age < 65 Years (n = 740)	Age $\geq 65$ Years (n = 219)
Age, y, median (IQR)	52.0 (12.0)	72.0 (9.0)
Male sex, n (%) [95% CI]	363 (49.1) [45.5 to 52.7]	89 (40.6) [34.4 to 47.3]
Race, n (%) [95% CI]		
Asian	16 (2.2) [1.1 to 3.2]	5 (2.3) [0.3 to 4.3]
Black	387 (52.3) [48.7 to 55.9]	127 (58.0) [51.5 to 64.5]
Hispanic	43 (5.8) [4.1 to 7.5]	9 (4.1) [1.5 to 6.7]
White	152 (20.5) [17.6 to 23.5]	30 (13.7) [9.2 to 28.4]
Other	9 (1.2) [0.4 to 2.0]	2 (0.9) [-0.3 to 2.2]
Declined	133 (18.0) [15.2 to 20.7]	46 (21.0) [15.6 to 26.4]
Ethnicity: Hispanic or Latino, n (%) [95% CI]	196 (26.5) [23.4 to 29.8]	56 (25.6) [20.2 to 31.8]

CI = confidence interval; IQR = interquartile range.

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