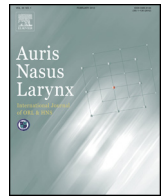




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## Factors influencing recurrent emergency department visits for epistaxis in the elderly

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### ABSTRACT

**Objective:** Our objective is to determine the risk factors associated with recurrent epistaxis requiring emergency department (ED) visits in the elderly.

**Methods:** We used a 5% national sample of Medicare data from January 2012 through December 2013. Our cohort included patients with a new diagnosis of epistaxis in the ED, defined as no epistaxis in the prior 12 months. We assessed the rates of ED visits for recurrent epistaxis in the 12 months following the incident visit. Our variables included demographics, geographic location, procedures performed during the incident visit and comorbidities.

**Results:** Out of the 4120 patients with incident epistaxis, 775 were readmitted with recurrent epistaxis within 12 months. 60% presented in the first 30 days and 75% within 90 days. There was a significant increase in ED visits for patients over 75 years of age and in men compared to women. Recurrent ED visits for epistaxis was higher in patients with congestive heart failure, diabetes mellitus, and obstructive sleep apnea compared to those without these comorbidities.

**Conclusion:** Additional ED visits for epistaxis are more common in the elderly and in males. Congestive heart failure, diabetes mellitus and obstructive sleep apnea were found to be independent risk factors.

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## 1. Introduction

Epistaxis is a common problem, affecting up to 60% of the U.S. population that rarely requires an emergency room (ED) visit [1–3]. Recurrent epistaxis requiring an ED visit results in increased morbidity particularly in the elderly, and is associated with high health care costs. It is unclear what risk factors are associated with increased incidence of ED visits in the elderly. ED visits for epistaxis were found to be the most common reason patients stop taking their antithrombotic agents (aspirin

and clopidogrel), resulting in an increased risk of in-stent thrombosis and myocardial infarction [4]. Older adults can be particularly vulnerable to the complications of recurrent epistaxis that include aspiration, angina, hypovolemia, myocardial infarction and aspiration [5].

In a prior study [6], we identified several risk factors associated with increased rates of ED visits for new-onset epistaxis, including older age, male gender, winter season and living in the northern U.S. Presumed risk factors for initial epistaxis include facial trauma, hypertension, dryness of the nasal mucosa, physical and chemical irritation [7]. In addition, systemic risk factors include bleeding diathesis, the intake of antiplatelet or anticoagulant medications. Controversy still exists on whether these traditional risk factors for initial epistaxis are risk factors for recurrent epistaxis. Personal history

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of trauma and nasal dryness are clear risk factors for initial ED visits for epistaxis, however, following their definitive management, these risks should not technically lead to recurrent ED visits. Risks factors for recurrent admissions to the ED with epistaxis most likely are a result of conditions that affect the nasal vasculature. It is unclear what patient comorbidities lead to recurrent admissions to the ED with epistaxis. In this study, our goal is to identify the rate and risk factors associated with recurrent admissions to the ED with recurrent epistaxis in the elderly.

## 2. Methods

### 2.1. Data source and study cohort

The study was exempt from UTMB IRB review. We used a 5% sample of Medicare claims data that included the Medicare Denominator File for demographic and enrollment information, the Carrier File for physician claims, the Outpatient Statistical Analysis File (OUTSAF) for outpatient claims, and the Medicare Provider Analysis and Review (MEDPAR) File for the inpatient claims.

We identified Medicare claims listing a primary diagnosis of epistaxis (International Classification of Diseases, Ninth Revision, Clinical Modification [ICD-9] diagnosis code of 784.7 from January 1, 2012, through December 31, 2012). We chose only those records with ED visits for epistaxis and patients who had full coverage of Part A, Part B without enrollment in any health maintenance organization (HMO). We used our study cohort that in our previous study on incident epistaxis [6] which included 4120 patients. The cohort was then followed for an additional 12 months for recurrent epistaxis requiring another ED visit.

### 2.2. Variables and study outcomes

Demographics included age, gender, race/ethnicity (white, black, Hispanic, and other), and geographic location. We assessed comorbidities that were found to be associated with epistaxis to determine whether they would represent risk factors for recurrence requiring readmission to the ED. Comorbidities included: chronic hypertension (ICD-9 401.x-405.x), congestive heart failure (CHF) (ICD-9 428.0-428.9) and diabetes mellitus (ICD-9 250.0-250.9), pulmonary embolism (ICD-9 415.x), mechanical heart valve (ICD-9 V43.3); and atrial fibrillation (ICD-9 427.0, 427.1, 427.2, 427.3), obstructive pulmonary disease (COPD) (ICD-9 491.0, 491.1, 491.20, 491.21), anxiety (ICD-9 300.00, 300.02, 300.09); and obstructive sleep apnea (OSA) (ICD-9 327.23). We also included all procedures that were performed to patients with epistaxis during the incident ED visit. These included anterior packing or cautery not requiring endoscopic guidance (CPT 30901, 30903, ICD-9-PCS 21.01), posterior packing or cautery not requiring endoscopic guidance (CPT 30905, 30906, ICD-9-PCS 21.02), diagnostic nasal endoscopy (CPT 31231, 92511, 31575), nasal endoscopy with control of bleed (CPT 31238), surgical ligation (30915, 30920, ICD-9-PCS 21.04, 21.05, 21.06, 21.09), and arterial embolization (CPT 61626 with 75894, 75798, 75774).

The outcome of the study was to identify factors associated with readmission to the ED with epistaxis.

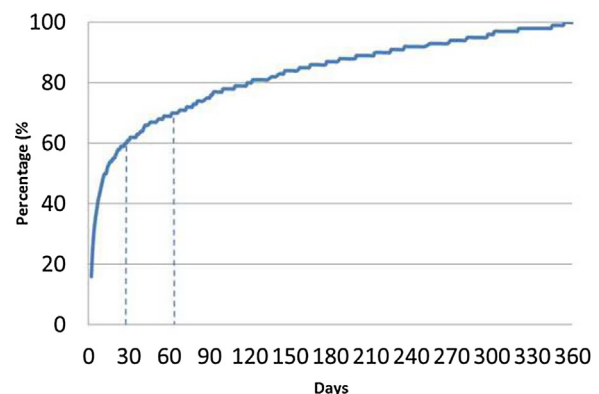
### 2.3. Statistical analyses

Readmissions were defined as those visits to the ED with recurrent epistaxis occurring in the 12 month period following the incident epistaxis visits. We excluded patients that had an ED visit claims within 1 day of their initial visit as this may represent the same admission. The differences in rates by various demographic variables were analyzed utilizing Chi-square with a 0.05 level of significance. Multivariate logistic regression analysis using the backward method was conducted to generate the odds ratio (OR) for patient characteristics independently associated with epistaxis with 95% confidence intervals (CI).

## 3. Results

In 2012, 4120 patients in the 5% sample of Medicare beneficiaries presented to EDs with new-onset epistaxis. Within 12 months of the initial visit, 775 patients (~19%) had recurrent epistaxis that required an ED visit. Fig. 1 presents the cumulative percentage of the first revisit to the ED from the initial epistaxis visit. Most patients (~60%) presented within the first 30 days and 75% within 90 days. Table 1 presents the baseline characteristics and rate of ED readmissions by each characteristic. Readmission rates were higher in older patients and in men ( $p = 0.020$ ). There were also no significant differences in readmission rates with regards to race/ethnicities. Table 2 presents the bivariate analysis by comorbidity and procedures. In an effort to capture patients who might be on anticoagulants, we grouped the following comorbidities into one “anticoagulant” group: history of pulmonary embolism, mechanical heart valve, and atrial fibrillation. Patients in the “anticoagulant” group, those with congestive heart failure, diabetes mellitus, and chronic obstructive pulmonary disease

**cumulative percentage of day of first ED visit after initial ED discharge**



**Fig. 1.** The cumulative percentage of patients revisiting the ED with recurrent epistaxis following the initial ED visit. Most patients (~60%) present within the first 30 days, and 70% present within 60 days.

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