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# Administration of Emergency Medicine

## CHARACTERISTICS AND TEMPORAL TRENDS OF "LEFT BEFORE BEING SEEN" VISITS IN US EMERGENCY DEPARTMENTS, 1995–2002

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□ **Abstract—The purpose of this study was to describe nationally representative characteristics and temporal trends in "left before being seen" (LBBS) visits in US emergency departments (EDs). The ED portion of the federal National Hospital Ambulatory Medical Care Survey, 1995–2002, was analyzed. Of the 810.6 million ED visits during the 8-year study period, an estimated 11.4 million (1.41%, 95% confidence interval [CI] 1.30–1.52) had an LBBS disposition. The number and proportion of LBBS visits have increased over time, from 1.1 million visits in 1995 (1.15%, 95% CI 0.95–1.35) to 2.1 million visits in 2002 (1.92%, 95% CI 1.67–2.17). LBBS patients were more likely to be younger, non-White, Hispanic, urban, and uninsured compared to non-LBBS patients. The number and proportion of LBBS visits have increased over time. LBBS visits disproportionately affect vulnerable populations. These findings suggest that recent strains on the US ED system are adversely affecting healthcare quality and access.** © 2007 Elsevier Inc.

□ **Keywords—Left before being seen; NHAMCS; ED crowding**

### INTRODUCTION

Emergency department (ED) crowding has become a national problem in the past several years. Crowding adversely affects all patients by delaying emergency care, but it also affects another group of ED patients: those who "leave before being seen" (LBBS) by a physician. Single center studies suggest that LBBS patients have high levels of morbidity, and LBBS seems to increase with ED crowding (1–6). Furthermore, vulnerable groups, such as minority and uninsured patients, have higher rates of LBBS compared to other patients (1,2,5). Thus, LBBS may be important as a quality of care measure, a proxy for the effects of ED overcrowding, and an indicator of health care access for vulnerable populations.

Recent strains on the US ED system suggest that the proportion of LBBS visits may have increased over time. The existing LBBS literature is based on single-center/regional, single time-point studies, and we are unaware of nationally representative data that address temporal trends in LBBS visits (1–8).

Using nationally representative data from the 1995–2002 National Hospital Ambulatory Medical Care Survey (NHAMCS), we describe characteristics and temporal trends in LBBS visits. We hypothesized that the proportion of LBBS visits has increased over time, and that this finding cannot be explained by increases in low-acuity LBBS visits. We also hypothesized that mi-

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nority and uninsured patients would have disproportionately high LBBS rates.

## METHODS

### *Study Design*

We performed a secondary analysis of the ED component of the 1995–2002 NHAMCS. This cross-sectional survey contains data on 209,000 ED visits, which represent approximately 811 million ED visits over the 8-year period. Analysis of the NHAMCS dataset was approved by the Human Research Committee.

### *Study Setting and Population*

NHAMCS is directed by the Centers for Disease Control and Prevention, and the National Center for Health Statistics (NCHS) (9). It is an annual, stratified, probability sample of non-institutional, general, and short-stay hospitals (excluding federal, military, and Veterans Affairs Hospitals) in the 50 US States and the District of Columbia.

### *Patient Selection*

A four-stage sampling strategy was used, covering geographic Primary Sampling Units (PSUs), hospitals within PSUs, EDs within hospitals, and patients within EDs. Hospitals were stratified by ownership, size, and region, and they were sampled with a probability proportional to ED volume. Over 400 hospitals per year were sampled.

### *Measurements*

Data forms included up to three patient reasons for the visit, disposition (which included LBBS), and demographic information including age, gender, race, ethnicity, region of the United States, urban status, insur-

**Table 1. Characteristics of LBBS and Non-LBBS Patients, 1995–2002**

| | | 95% CI | | | 95% CI | |
|---|---|---|---|---|---|---|
| | % Total of LBBS patients* | Low | High | % Total of non-LBBS patients* | Low | High |
| Age (years) | | | | | | |
| <20 | 30.8% | 27.9% | 33.8% | 29.2% | 28.9% | 29.6% |
| 20–29 | 23.7% | 20.4% | 27.0% | 16.5% | 16.2% | 16.8% |
| 30–39 | 19.0% | 16.3% | 21.7% | 15.5% | 15.2% | 15.8% |
| >40 | 26.4% | 24.4% | 28.5% | 38.8% | 38.4% | 39.2% |
| Gender | | | | | | |
| Female | 52.3% | 49.0% | 55.6% | 52.9% | 52.5% | 53.3% |
| Male | 47.7% | 44.9% | 50.5% | 47.1% | 46.7% | 47.5% |
| Race | | | | | | |
| White | 64.8% | 62.3% | 67.3% | 76.3% | 76.0% | 76.7% |
| Black | 32.4% | 28.9% | 35.8% | 20.9% | 20.6% | 21.3% |
| Other | 2.8% | 2.0% | 3.6% | 2.7% | 2.6% | 2.8% |
| Ethnicity | | | | | | |
| Non-Hispanic | 65.7% | 63.1% | 68.2% | 70.9% | 70.6% | 71.3% |
| Hispanic | 13.1% | 10.9% | 15.3% | 9.6% | 9.4% | 9.8% |
| Region | | | | | | |
| Northeast | 17.6% | 15.3% | 20.0% | 19.4% | 19.1% | 19.7% |
| Midwest | 19.4% | 17.1% | 21.6% | 25.6% | 25.2% | 25.9% |
| South | 46.9% | 43.8% | 50.1% | 37.2% | 36.8% | 37.6% |
| West | 16.1% | 13.8% | 18.3% | 17.9% | 17.6% | 18.2% |
| Urban Status | | | | | | |
| Urban | 88.0% | 85.5% | 90.6% | 77.9% | 77.6% | 78.3% |
| Non-Urban | 12.0% | 10.4% | 13.5% | 22.1% | 21.8% | 22.4% |
| Insurance | | | | | | |
| Private | 27.3% | 24.7% | 30.0% | 39.7% | 39.3% | 40.1% |
| Public | 26.7% | 23.6% | 29.8% | 30.6% | 30.3% | 31.0% |
| Other | 9.7% | 5.3% | 14.1% | 9.0% | 8.7% | 9.3% |
| Self-pay | 24.5% | 22.3% | 26.7% | 15.8% | 15.5% | 16.1% |
| Unknown | 11.7% | 9.8% | 13.7% | 4.8% | 4.6% | 5.0% |
| Illness severity† | | | | | | |
| Urgent | 28.1% | 24.9% | 31.2% | 50.0% | 49.5% | 50.4% |
| Non-urgent | 71.9% | 69.6% | 74.3% | 50.0% | 49.7% | 50.4% |

* Strata for variables may not sum to 100% due to missing data.
† Coding changed after 1997; please see text for details.