

# Tobacco Smoke Exposure–Related Illnesses Among Pediatric Emergency Department Patients

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## ABSTRACT

**Introduction:** This study aimed to determine the relationship between patients presenting to the pediatric emergency department (PED) and potential tobacco smoke exposure (TSE)–related illnesses.

**Methods:** A retrospective review of electronic medical records of pediatric emergency department patients ( $N = 116,084$ ) was conducted. Sociodemographic characteristics, TSE-related illnesses, and TSE documentation were extracted. Logistic regression analyses were performed.

**Results:** More than one fifth (21.7%) of patients had TSE-related illnesses. Patients who were younger, male, non-White, or Hispanic; had Medicaid/Medicare insurance, had

low triage acuity; or were admitted to any non-intensive care unit or intensive care unit were significantly more likely to have TSE-related illnesses. Twenty-eight percent of patients with TSE documentation had positive TSE status. Although regression models for positive TSE indicated similar findings, no difference was found based on ethnicity. **Discussion:** Pediatric emergency departments, especially those that care for large numbers of children, should offer tobacco interventions that target at-risk populations and caregivers who are most likely not receiving interventions in other health care settings. *J Pediatr Health Care.* (2016) ■, ■-■.

## KEY WORDS

Emergency department, pediatrics, secondhand smoke, tobacco use

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Smoking and tobacco smoke exposure (TSE) are together the most preventable cause of death in the United States (U.S.; [U.S. Department of Health and Human Services, 2014](#)). Although TSE has decreased over the years, a recent national study showed that an estimated 24.9 million children and adolescents are still exposed to smoke annually ([Homa et al., 2015](#)). It is well known that TSE is associated with adverse health effects; among children these include increased infections, respiratory symptoms and attacks, and sudden infant death syndrome ([U.S. Department of Health and Human Services, 2006](#); [U.S. Department of Health and Human Services, 2010](#); [U.S. Department of Health and Human Services, 2014](#)). Thus, the U.S. Department

of Health and Human Services (2014) concluded that there is no risk-free TSE level, and even little exposure is known to cause harm in children.

The American Academy of Pediatrics (2009) considers tobacco use a pediatric disease and exhorts implementing initiatives during all health care visits to decrease TSE and associated harms. Children continue to account for a large number of visits to U.S. emergency departments (EDs), and in 2010 alone, there were over 25 million ED visits for children (Wier, Yu, Owens, & Washington, 2013). Given the high burden of pediatric tobacco-related morbidity, the American College of Emergency Physicians Task Force on Smoking Cessation has highlighted the need for tobacco control efforts in pediatric emergency departments (PEDs) (Bernstein et al., 2006). Thus, PEDs may be an opportune yet underused venue for decreasing TSE-related illnesses among children by providing tobacco prevention interventions for caregivers (Mahabee-Gittens & Gordon, 2008; Mahabee-Gittens, Gordon, Krugh, Henry, & Leonard, 2008; Mahabee-Gittens, Khoury, Ho, Stone, & Gordon, 2015). Smoking rates are high among low-income caregivers who bring their children to the PED, and their children have high rates of TSE (Mahabee-Gittens, Stone, & Gordon, 2013); thus, identifying populations at risk for TSE-related illnesses may help in developing tailored PED cessation interventions that could decrease their associated TSE-related PED visits and costs.

The purpose of this study was to determine the relationship between potential TSE-related illnesses and patients presenting to the PED. Based on prior research (Bernstein, 2002), we hypothesized that the use of the PED for potential TSE-related illnesses would be high and that certain populations would be most at risk of presenting to the PED for TSE-related illnesses.

## METHODS

### Study Design

We conducted a secondary analysis on data obtained from a prior cross-sectional, retrospective study. Data were captured from electronic medical records (EMRs). The institutional review board approved this study.

### Participants and Study Setting

Our sample consisted of patients ages 0 to 18 years old ( $N = 116,084$ ) who presented to the PED at a Level 1 pe-

diatric trauma center in between March 2012–August 2013.

### Measures

Sex and age of patients were extracted from EMRs using Epic (Epic Systems Corporation, Verona, WI), the institution's medical software program. For statistical purposes, race categories included White/Caucasian, Black/African American, and other (i.e., Asian, American Indian and Alaska Native, Native Hawaiian and Other Pacific islander, multiple races, other, and unknown). Ethnicity categories were non-Hispanic and Hispanic origins. Insurance type was classified as commercial and Medicaid/Medicare. The five-level Emergency Severity Index triage tool used by the PED was used to dichotomize patients into two acuity groups: low-acuity patients, (Emergency Severity Index levels 3–5) who were at low risk of clinical deterioration (e.g., earaches), and high-acuity patients (Emergency Severity Index levels 1–2), who were at high risk of clinical deterioration (e.g., respiratory distress). Disposition was categorized as (a) discharge to home, (b) admission to any non-intensive care unit (ICU) service; and (c) admission to the ICU.

TSE status was extracted from the Epic social history section that documented caregivers' responses to *tobacco/smoke exposure*. Patients with a *Yes* response were defined as having a positive TSE status, and those with a *No* response were defined as having a negative TSE status. Our outcome variable, TSE-related illnesses, was based on the *International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM; Centers for Disease Control and Prevention, 1996)* and extracted from patients' EMRs. Discharge diagnoses were classified as potential non-TSE-related illnesses or TSE-related illnesses. The Surgeon General and authors of other studies indicate that the following are potential TSE-related illnesses: otitis media, otorrhea, otalgia, rhinitis, asthma, all respiratory infections, respiratory failure, cough, wheeze, shortness of breath, throat pain, laryngeal spasm, tachypnea, sudden infant death syndrome, apnea, and hypoxemia (Anderson & Cook, 1997; Jones et al., 2011; Lakshmipathy, Bokesch, Cowan, Lisman, & Schmid, 1996; U.S. Department of Health and Human Services, 2014; Weinstock et al., 2014; Willatt, 1986).

### Statistical Analysis

Descriptive statistics including frequencies and cross-tabulations were performed to determine the frequency of assessed patient characteristics, TSE status, TSE-related illnesses, and the top five TSE-related illnesses by patient characteristics. Univariate logistic regression models were performed to assess patient differences based on TSE-related illnesses among all participants regardless of TSE status. These differences were also examined in a subsequent series of univariate

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