Characteristics of Nontrauma Scene Flights for Air Medical Transport

Margaret G. Krebs,[1] BS, Erica N. Fletcher, MPH,[1] Howard Werman, MD,[2,3] and Lara B. McKenzie, PhD, MA[1,4,5]

Abstract

Introduction: Little is known about the use of air medical transport for patients with medical, rather than traumatic, emergencies. This study describes the practices of air transport programs, with respect to nontrauma scene responses, in several areas throughout the United States and Canada.

Methods: A descriptive, retrospective study was conducted of all nontrauma scene flights from 2008 and 2009. Flight information and patient demographic data were collected from 5 air transport programs. Descriptive statistics were used to examine indications for transport, Glasgow Coma Scale Scores, and loaded miles traveled.

Results: A total of 1,785 nontrauma scene flights were evaluated. The percentage of scene flights contributed by nontraumatic emergencies varied between programs, ranging from 0% to 44.3%. The most common indication for transport was cardiac, nonST-segment elevation myocardial infarction (22.9%). Cardiac arrest was the indication for transport in 2.5% of flights. One air transport program reported a high percentage (49.4) of neurologic, stroke, flights.

Conclusion: The use of air transport for nontraumatic emergencies varied considerably between various air transport programs and regions. More research is needed to evaluate which nontraumatic emergencies benefit from air transport. National guidelines regarding the use of air transport for nontraumatic emergencies are needed.

Introduction

Air medical transport is an integral part of emergency medical services in the United States and throughout much of the world. Air medical transport allows time-dependent, critically ill or injured patients as well as patients from rural areas with prolonged travel times to rapidly reach medical centers and receive critical medical care en route to the hospital.[1] Although, in practice, both trauma and nontrauma patients are transported via air medical transport, there is a dearth of published literature on the types of nontraumatic emergencies that are commonly transported via air medical transport and whether or not air medical transport improves outcomes in these patients. Previously published studies have focused on air medical transport of patients who have suffered major traumatic events, such as motor vehicle crashes, and numerous studies have documented the usefulness of air medical transport for significantly reducing the mortality of these patients.[2-4]

Although there are little data on air medical transport for nontraumatic emergencies as a whole, the use of air medical transport in some specific nontraumatic emergencies has been described. One area of interest is the role of air medical transport in the treatment of patients with cardiac emergencies and strokes in whom rapid intervention decreases mortality and improves the outcomes of survivors.[5,6] The use of air medical transport scene responses has been described as a means of extending access to thrombolytic therapy to rural stroke victims.[7] A secondary analysis of patients transported by ground suggested that the use of helicopter scene response could lessen the time to percutaneous coronary intervention in patients with ST-segment elevation myocardial infarction (STEMI); however, additional research using actual flight data is needed.[8] Patients with other conditions such as obstetric and neonatal emergencies and poisonings can be transported safely and quickly via air.[9-11] However, those studies included both scene responses and interhospital transfers; to our knowledge, the use of air medical transport for nontrauma scene flights has not been adequately described.

1. Center for Injury Research and Policy, The Research Institute at Nationwide Children's Hospital, Columbus, OH

2. Department of Emergency Medicine, The Ohio State University, College of Medicine, Columbus, OH

3. MedFlight, Columbus, OH

4. Department of Pediatrics, The Ohio State University, College of Medicine, Columbus, OH

5. Division of Epidemiology, The Ohio State University, College of Public Health, Columbus, OH

Address for correspondence:
Howard Werman, MD, 2827 West Dublin-Granville Road, Columbus, OH 43235, hwerman@medflight.com

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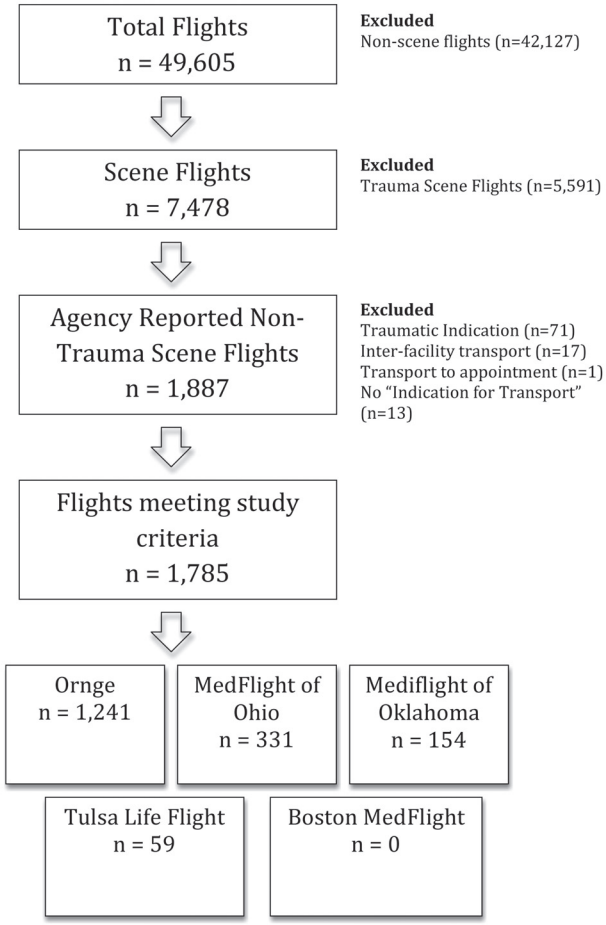
Figure 1. Nontrauma scene flights by agency.



There are little recent data describing nontrauma scene responses by air medical transport. Other smaller, retrospective studies have found that nontrauma scene flights account for a small percentage of all helicopter transports, but these same studies differ as to whether the majority of these flights were appropriate.[12-14] The primary end point of this study is to describe the rates of nontrauma scene flights among 5 air medical transport programs, with a secondary goal of describing primary diagnoses in those nontrauma scene flights.

Methods

Data Source

A request for air medical transport programs to contribute data on nontrauma scene flight responses was posted on the Critical Care Transport Collaborative Outcomes Research Effort website.[15] Interested air medical transport programs submitted data for nontrauma scene flight requests that took place from January 1, 2008, through December 31, 2009. Five air medical transport programs submitted data: Ornge (Toronto, Ontario), MedFlight (Columbus, Ohio), Mediflight of Oklahoma (Oklahoma City, Oklahoma), Tulsa Life Flight (Tulsa, Oklahoma) and Boston MedFlight (Boston, Massachusetts).

Variables

Data collected from each air transport program included a general description of the program and individual flight and patient level data including patient's age, sex, indication for transport, Glasgow Coma Scale (GCS) score, date of the request, number of loaded miles of the flight, and whether or not the flight was completed. Each program provided the total number of flight requests (including trauma), the total number of flights dispatched (including trauma), and the total number of scene flights (including trauma) during the study period. The indications for transport were described in a brief open-text field by emergency medical service providers and were categorized by 1 of the authors (MK) as cardiac, STEMI; cardiac, non-STEMI; gastrointestinal and/or acute abdominal pain; obstetric and/or gynecologic including neonates; neurologic, stroke; neurologic, nonstroke; respiratory; environmental; poisoning or overdose; altered level of consciousness; general medical (including fever, infectious disease, pain, patients described as "generally unwell," and other complaints); and cardiac arrest. Patients were separated into 3 age groups: neonate to 19, 20 to 59, and ≥ 60 years of age. Loaded miles, the distance traveled with the patient, was grouped into 1 of 4 categories: patient not transported by air (0 miles), 1 to 50 miles, 51 to 100 miles, and ≥ 101 miles.

Statistical Analyses

Data were analyzed by using SPSS 19.0 (SPSS Inc, Chicago, IL). Means (standard errors), medians, and interquartile ranges were used to characterize the patients and transports. Bivariate comparisons were conducted by using chi-square tests, and the strength of association was assessed by using odds ratios and 95% confidence intervals. The institutional review boards of the 2 institutions where the data were analyzed approved this study.

Results

Patient and Flight Characteristics

Programs reporting data attempted a total of 49,605 flights, and a total of 1,785 nontrauma scene flights were included in these analyses (Fig. 1). Nontrauma flights accounted for 3.7% of all flights and 24.6% of scene flights (Table 1). The median age was 53 years and ranged from neonates < 1 day old to 98 years of age. Females accounted for 52.1% of cases (Table 2). The median age of transported females was younger than males (49 vs. 55 years, $P < .01$). Patients who were 20 to 59 years of age comprised the largest transported age group (47.3%), followed by patients ≥ 60 years of age (40.3%). Four male neonates were included in the obstetric and/or gynecologic category. The flights ranged from 0 to 680 miles traveled, with a mean flight distance of 43.4 (0.96) miles. Most flights ranged from 1 to 50 loaded miles (73.3%), followed by 51 to 100 miles (17.6%).