

BRIEF REPORT

# Emergency Medical Service in the US National Park Service: A Characterization and Two-Year Review, 2012–2013

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**Objective.**—Visitors to US National Park Service (NPS) units have a unique set of needs in terms of emergency medical care. The purpose of this review is to quantify and characterize emergency medical services (EMS) activities in the NPS to elaborate on its unique aspects, establish trends, and benchmark these data against a sample of national EMS data.

**Methods.**—The EMS data for calendar years 2012 and 2013 were queried from national NPS reports.

**Results.**—The EMS responses totaled 40 calls per million visitors in 2012 and 34 calls per million visitors in 2013. Of those, 75% required a basic life support level of care. There were comparable incidences of transported EMS trauma calls (49%) and medical calls (51%). Of a total of 137 sudden cardiac arrest events, 65% of patients received defibrillation and 26% survived to hospital release. There were 262 total fatalities in 2012 and 238 in 2013, with traumatic fatalities occurring approximately twice as often as nontraumatic fatalities.

**Conclusions.**—Across the country, the NPS responded to a large number of EMS calls each year, but with a relatively low frequency, considering the large number of visitors. This is a challenging setting in which to provide consistent EMS care throughout various NPS administered areas. The typical NPS EMS response provided basic life support level care to visitors with traumatic injuries. The NPS caregivers must be prepared, however, to respond to a varied and diverse range of EMS calls.

*Key words:* emergency medical services, National Park Service, automated external defibrillator, wilderness, rescue, sudden cardiac arrest

## Introduction

The US National Park Service (NPS) oversees 401 land areas encompassing more than 84 million acres. These areas, or units, received more than 430 million visitors each year in 2012 and 2013.<sup>1</sup> National parks comprise 59 of the 401 units, with recreation areas, preserves, seashores, battlefields, monuments, and historic sites making up the rest. Units are further divided into 7 geographic regions. Individual units cover a spectrum from urban, populated sites to remote, rugged wilderness.<sup>1</sup> This presents a challenging environment in which to provide emergency medical services (EMS) care and necessitates a uniquely adapted EMS infrastructure.

The NPS must be capable of responding to traditional, frontcountry EMS needs as well as nontraditional

wilderness medical emergencies in backcountry terrain.<sup>2,3</sup> Compared with a traditional environment, backcountry emergency care poses additional challenges, including difficulty accessing or evacuating a patient, extreme environmental conditions, and inability to have real-time physician medical oversight.<sup>4</sup>

The EMS operations are overseen at the national level by the NPS Washington Support Office, which provides protocol standards to the overall NPS EMS system. At the level of the individual NPS unit, there is generally an EMS coordinator and a local physician medical director. Coordination of EMS is often a collateral duty, meaning that duties are not meant to exceed 25% of the total individual workload. Activity of EMS depends on the individual unit and has been shown to vary geographically. Smaller or less-visited units, for example, might rely on outside EMS agencies, such as a county ambulance service.<sup>5</sup>

The unique aspects of EMS care within NPS units have been previously established.<sup>5</sup> The purpose of this

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review is to update those previous data and to provide additional insight by considering previously unreported aspects of EMS care. These characteristics include personnel, resources, funding, and response times. Also included are NPS search and rescue (SAR) activities because these often involve backcountry patient care. These NPS data will be benchmarked against data from the National EMS Information System (NEMSIS), an online national EMS database, and previous NPS data in an attempt to establish trends.

## Methods

This is a retrospective review of internally generated NPS data for the calendar years 2012 and 2013. Data pertaining to NPS, EMS, and SAR activities, funding, and personnel were obtained from NPS annual reports.<sup>1</sup> Dispatch, on-scene, and transport times were taken from the electronic patient care record (ePCR) database. Important limitations of the database include an inability to provide a measure of spread and to account for data entry errors, leading to extraneously long maximum reported values. Visitation data were obtained from the NPS website available to the public.<sup>1</sup> These NPS data were benchmarked against data for the same period from NEMSIS (version 2; available at: nemsis.org) and previously published NPS data.<sup>5</sup> Institutional Review Board approval was granted through the University of Utah.

Each individual NPS unit records internal EMS and SAR activities and forwards annual results to the Visitor and Resource Protection Division of the Intermountain Regional Office. The data are then compiled and added to the NPS annual report form. The NPS provided the data included in this review from these reports. National-level EMS data were obtained for the 2 calendar years included in the review from NEMSIS and are included as a qualitative comparison rather than as a comprehensive quantitative statistic.

Data reported here include care provided by NPS personnel only, excluding care provided by third parties. Therefore, this review is limited to care provided by the NPS and is not a comprehensive tally of all care provided within NPS administered units. Care initiated by NPS personnel and subsequently transferred to other agencies for transport and continuation of care is included here.

Incidence statistics listed as “per million visitors” were generated using a recreational visitor count. Incidence was calculated by dividing the total number of events by the number of recreational visitors in millions, using Microsoft Excel 2013 (Redmond, WA). Recreational visitor counts are generally gatehouse tallies. Visitor center counts are used if the park does not have a gate.

Persons entering a nongated park after hours, NPS or third-party employees, and park residents are among those not represented in this count.<sup>1</sup> Recreational visitation, rather than total visitation, is used to allow for comparisons with previously published incident rates.<sup>5</sup> However, NPS annual reports do not subdivide EMS responses by visitor type. Therefore, true event rates that include total visitors, rather than solely recreational visitors, are likely lower than event rates included in this review. Therefore, such rates are not meant to be an epidemiologic assessment of injuries within NPS units, but rather simply a comparison to those previously published rates.

## Results

Recreational visitors totaled 282,765,682 in 2012 and 273,639,895 in 2013. Overall visitation, including both recreational and nonrecreational visitors, totaled 432,206,862 in 2012 and 430,410,197 in 2013.

### PERSONNEL

Individual care providers included a range of training levels (Table 1). Most EMS operations are carried out by park rangers. A small number of dedicated EMS providers focus on EMS calls only. Paramedics and parkmedics provide advanced life support (ALS) level care. The parkmedic, a level of care unique to the NPS, is similar to an advanced emergency medical technician, with additional skills predominantly related to prolonged care in remote settings (ie, antibiotics, joint reductions). These skills are taught during a biennial course at the University of California, San Francisco–Fresno. Basic life support (BLS) level care is provided by emergency medical responders (EMR) and emergency medical technicians (EMT).

### RESOURCES AND FUNDING

The NPS operated 144 ambulances in 2012 and 157 in 2013, accounting for 90% of NPS patient transports. Other modes of transport included water craft (5%), nonambulance vehicles such as a patrol car (3%), and aircraft (2%).

**Table 1.** Care providers employed by the National Park Service

Year	EMR	EMT	Parkmedic	Paramedic	Physician
2012	469	1532	148	89	144
2013	452	1464	153	89	157

Emergency medical responder (EMR) includes both first responders and wilderness first responders (WFR); emergency medical technician (EMT) includes both EMT-basic and wilderness EMT (WEMT). Physicians serve as medical directors for individual park units.

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