

THE CALIFORNIA 500: MEDICAL CARE AT A NASCAR WINSTON CUP RACE

Jeff T. Grange, MD, Gregory W. Baumann, MD

ABSTRACT

Background. Stock car racing is America's fastest-growing professional sport. With more than 5.5 million paid admittances and another 148 million watching the 34-race NASCAR Winston Cup series on television, emergency physicians are increasingly called upon to organize medical support for such events. Currently, little reliable information is available to assist in determining what specific personnel and equipment are necessary to optimally support a race event. **Objective.** To characterize the spectrum of presenting injuries and illnesses at a NASCAR Winston Cup event. **Methods.** This study was a retrospective review of all patients presenting to nine on-site first aid stations from June 19 to 22, 1997, for the inaugural California 500 race weekend at California Speedway in Fontana, California. Staffing of the nine first aid stations was provided by 20 paramedics, 25 emergency nurses, five emergency physicians, nine advanced life support (ALS) ambulances with two crew members each, and a medically configured helicopter with flight crew. **Results.** Of the 923 patients seen, 38 were drivers/crew, 230 were track employees, and 644 were spectators. One hundred thirty-six of the patients were treated in the two infield facilities, while 787 were treated in the grandstand first aid stations. Patients seen per hour peaked just before the start of the race at 73 patients seen. Of the ten patients transported to the hospital, three required admission. No deaths occurred. **Conclusion.** These data may assist individuals planning medical support for large motorsports venues. **Key words:** sports events; stock car races; NASCAR races; first aid stations; mass gatherings.

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Stock car racing is America's fastest-growing professional sport.¹ The premier stock car racing series is the 34-race National Association of Stock Car Auto Racing (NASCAR) Winston Cup series, with more than 5.5 million paid admittances and another 148 million watching on television in 1996.² The spectators at each race have continued to grow by about 9% per year since 1990.¹

Emergency physicians are increasingly called upon to organize medical support for mass gatherings such as large racing events.³⁻¹² Currently, little reliable

information is available to assist in determining what specific personnel and equipment are necessary to optimally support a race event. Mears and Batson¹³ have reported patient loads at general mass gatherings as ranging from 1.2 to 60 patients per ten thousand spectators (PPTT). The 50-fold range of this projection substantially limits its usefulness as a planning tool, and, furthermore, it is uncertain whether these data are applicable to the unique characteristics of a large race event.

Previous authors have described medical care of race car drivers.¹⁴⁻¹⁸ In addition, the demographics of medical care at a large "open-wheel" racing event has been presented from Indianapolis Motor Speedway.¹⁹⁻²² Our goal is to describe the medical system at a superspeedway and the spectrum of medical problems encountered during a NASCAR Winston Cup race weekend.

METHODS

Study Design

We performed a retrospective review of all patients encountered during a NASCAR Winston Cup race weekend at California Speedway. Because of the retrospective nature of this study, it was considered exempt from review by the institutional review board.

Study Setting and Population

California Speedway is a state-of-the-art, 2-mile, D-shaped superspeedway in southern California built in 1996-1997 by Penske Motorsports, Inc., at a cost of more than \$110 million. The California Speedway is host to numerous racing events, including the NASCAR Winston Cup race, the Championship Auto Racing Teams (CART) FedEx Series, International Race of Champions (IROC), NASCAR Busch Grand National Series, NASCAR Trucks, NASCAR Winston West, and Indy Lights series. Typical race "weekends" start on Thursday with testing (closed to the public) and continue with qualifying on Friday, a support race on Saturday, and the main race on Sunday. The California Speedway had grandstand seating for about 73,000 guests with infield recreational vehicle and other spaces for another estimated 30,000.

Medical support was provided by 20 paramedics, 25 emergency nurses, five emergency physicians, nine advanced life support (ALS) ambulances with two crew members [one emergency medical technician

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Address correspondence and reprint requests to: Jeff T. Grange, MD, Loma Linda University Medical Center, Department of Emergency Medicine, 11234 Anderson Street, Room A108, Loma Linda, CA 92354. e-mail: <jgrange@pol.net>

TABLE 1. Medical Problems by Category

Type of Problem	Total
Allergic reaction/sting	15 (2%)
Burn	25 (3%)
Cardiac	8 (1%)
Head injury	7 (1%)
Eye problem	28 (3%)
Gastrointestinal	55 (6%)
Heat-related	59 (6%)
Intoxication	7 (1%)
Miscellaneous medical problem	89 (10%)
Bone/joint injury	68 (7%)
Headache	275 (30%)
Respiratory	6 (1%)
Soft-tissue injury	291 (32%)
Major trauma	0 (0%)

(EMT) and one EMT-paramedic] each, and a medically configured helicopter with paramedic/nurse/pilot flight crew. The medical personnel worked either in one of the nine medical aid stations, on an ALS "mini-ambulance," on a basic life support (BLS) golf cart, or on a full-size ambulance. Two of the nine medical aid stations (one in the grandstands and one in the infield) were staffed with emergency physicians with the equipment and capability to suture, splint, defibrillate/cardiovert, medicate, hydrate, perform rapid-sequence intubation (RSI), perform surgical cricothyrotomies and/or central lines, etc., as necessary.

Since about 20,000 people camped in their recreational vehicles on the infield of the track, medical support was available 24 hours per day at one of the medical aid stations. All medical care at California Speedway was done at no charge to the patient. In addition, during race weekends, all 911 calls for medical aid on California Speedway property are forwarded to the speedway dispatchers from the county 911 center.

The study sample included all persons who presented to any medical aid station or medical team personnel at California Speedway from June 19 (Thursday) to June 22 (Sunday), 1997.

Study Protocol

All patients during the race weekend had their chief complaint, time, date, age, gender, status (spectator,

employee, driver, crew, etc.), location problem began, diagnosis, and treatment recorded on one of two standard medical records. At the end of each day all records were collected and entered into a computer database (Microsoft Excel, Office 97, Redmond, WA).

Chief complaints were classified by the investigators into one of 14 categories (Table 1). For those patients with more than one complaint, we assigned as the chief complaint our best estimation of the most immediate reason for seeking medical attention. Thus, a patient who was intoxicated, became dizzy, fell, and sustained a laceration to the finger was classified according to the chief complaint of "soft-tissue injury."

We calculated the PPTT for each day using patient logs and attendance data.

RESULTS

Nine hundred twenty-three patients were evaluated by California Speedway medical staff (Table 2) at nine medical aid stations over four days. Total spectator attendance over the four days was 214,000. This does not include the number of employees, drivers, crew members, media, etc., which is estimated to be another 5,000 people per day.

Spectators comprised 644 of 923 (70%) of the patients seen. Track employees were next most common, with 230 of 923 (25%), followed by crew, drivers, and owners, with 38 of 923 (4%), media at nine of 923 (1%), and two patients who were not classified by category.

The most common chief complaint was soft-tissue injury (291), followed by headache (Table 1).

The PPTT remained relatively constant at 40.8 on Friday, 45.1 on Saturday, and 41.6 on Sunday. The maximum patients seen per hour peaked on Sunday at 73 just after the conclusion of the race (Fig. 1).

The number of patients seen at each medical aid station ranged from 40 (Terrace Suite First Aid) to 196 (Center Midway First Aid).

DISCUSSION

Patients at our venue have presented with a multitude of complaints ranging from chest pain, active labor, pediatric fevers, cough, altered mental status, difficult airways, to major trauma after "hitting the wall" at

TABLE 2. Medical Care Summary

	Thursday (Testing)	Friday (Qualifying)	Saturday (Support Race)	Sunday (Winston Cup)	Grand Totals
Attendance estimate	Closed to public	48,000	71,000	95,000	214,000
Minor care: <5 minutes	1	57	118	149	325 (35%)
Basic care: 5-15 minutes	9	135	182	227	553 (60%)
Advanced care: ALS* procedures	2	4	20	19	45 (5%)
Transferred to hospital	0	3	3	4	10
Total patients treated	12	196	320	395	923
Patients/10,000 (PPTT) spectators		41	45	42	43

*ALS = advanced life support.

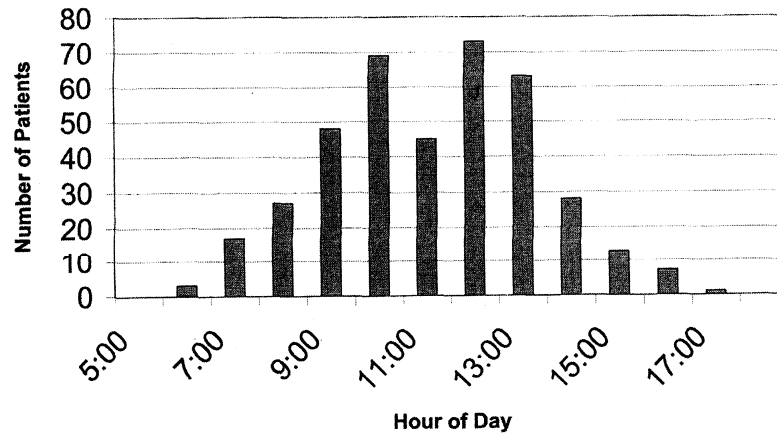


FIGURE 1. Number of patients seen each hour on race day.

200 mph. Physicians working such an event, therefore, must be qualified to deal with all of these medical and surgical emergencies. Physicians working such an event must be able to work well with prehospital personnel such as EMTs, paramedics, and nurses and understand their scope of practice and capabilities. For optimal patient care physicians should also have an intimate knowledge of the local emergency medical services (EMS) system and ideally they should work in it on a routine basis. In general, emergency physicians with experience in EMS who are capable of working in an out-of-hospital environment are the most qualified to provide such care at a large mass gathering.

Some have asked whether physicians are necessary or helpful at a mass gathering. In the authors' experience at more than 200 mass gatherings, the presence of a physician can significantly lessen the impact of an event on the surrounding EMS community. At this particular event, only ten patients required transport out of 923 patients seen. Much of this was due to the physicians' ability to suture wounds, prescribe and dispense medications, etc. Although x-ray and laboratory services were not available, most patients were able to be seen just as in an emergency department and to be dispositioned without causing undue stress on the local hospitals and EMS system.

LIMITATIONS AND FUTURE QUESTIONS

There are several important limitations to this study. The data were collected in a single race weekend and may not be representative of medical care at other NASCAR Winston Cup events or other large race events.

The study is subject to the usual limitations of retrospective studies, including the dependence on medical record documentation quality. We believe that these factors have minimal impact on our results, because

the information we abstracted from the records was objective and not prone to misinterpretation or abstractor bias.

The data were collected in southern California, and it is uncertain how climatic differences in other regions might produce variances in overall patient load and spectrum of illness.

Future studies should assess the demographic factors of race event attendees as a whole to determine how attendee gender, age, socioeconomic status, or particular event preferences might influence patient load. More accurate data regarding alcohol and drug use would also permit better characterization of their contribution to the injuries and illnesses observed.

CONCLUSION

We treated 923 patients out of 214,000 attendees at a NASCAR Winston Cup race weekend. Drivers and crew members constituted only 4% of all patients seen during the race weekend. With on-site physicians, only about 1% of patients required transport to a hospital. We found that patient load at a NASCAR Winston Cup race weekend ranged from 41 to 45 patients per 10,000 (PPTT) attendees per day. More than half of the chief complaints were classified as either headache or soft-tissue injury. These data may assist individuals planning medical support for such events.

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