

# NASCAR to NASA: Event Medicine for Suborbital Spaceflight Operations

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## Abstract

Commercial suborbital vehicles operations are currently providing research opportunities, and are expected to be flying crew and other participants in the near future. As operations begin, the structure and integration of fire and medical support personnel can be expected to provide a safe medical infrastructure for spaceflight participants. While operations could be performed without emergency support personnel, the addition of trained first responders increases safety and reduces risk for the people involved. Event medicine is an effective model to provide safety during spaceflight operations.

## NASCAR Medical Support

NASCAR, the National Association for Stock Car Auto Racing is an American business venture that governs multiple auto-racing sports events. Auto racing is a high technology event with specifically created high capability vehicles, similar to spaceflight launches. The popularity of auto racing is second only to the National Football League in American Sports. NASCAR has evolved increased driver safety and medical response capabilities in response to medical events and injuries that have occurred in the past. (1) The current medical capabilities have expanded, and can serve as an event medicine model for spaceflight operations.

NASCAR has a medical director and support staff of occupational health providers who work full time for the company. At each event, a coordinated team of highly trained support personnel including firefighters, EMS personnel, nurses and physicians are deployed to respond as needed to incidents on the track. As capabilities have evolved, emergency

physicians provide care directly on track, in the Chase Car, as well as an Infield Care Center, and a separate care facility for spectators. Capabilities for evacuation and mass casualty response are coordinated with localities. Utilizing consistent trained personnel who travel, provides a consistent response capability across multiple states, venues, and allows consistent and excellent medical care. The training and response coordination is in many ways analogous to the teams created by NASA to provide support at Kennedy Space Center launch operations.

## NASA Medical Support

NASA utilized a similar system of employed and subcontracted medical providers, and additionally used military assets to provide a robust response capability for launch and landing operations. An extensive training program ensured that providers were educated to spaceflight specific hazards, and physiological changes resulting from spaceflight. NASA flight surgeons work with emergency physicians and trauma surgeons contracted to provide support for specific launches, until the end of the Shuttle program. (2)

## Commercial operations

Consistent medical providers and trained response personnel will be able to provide medical screening, hazard analysis, risk mitigation, emergency response, and adverse event surveillance in commercial operations. Lessons learned from event operations can be used for planning and response for commercial spaceflight operations. Preplanning and training will be required to ensure risk reduction for participants.

- (1) How Doctors are evaluating NASCAR drivers after they crash: <http://ftw.usatoday.com/2017/04/nascar-new-rules-in-field-medical-care-center-doctors-concussion-physical-exam>  
(2) The University of Florida NASA Medical Support Team bids farewell to the Space Transport System: <http://emergency.med.ufl.edu/2011/07/20/the-university-of-florida-nasa-medical-support-team-bids-farewell-to-the-space-transport-system>

**Photo:** Dr. Cuttino responding at the Richmond International Raceway.

