

**JOHN P. PATALAK, PhD, PE**

*Vice President, Safety Engineering*

**National Association for Stock Car Auto Racing, Incorporated (NASCAR)**

*Owner*

**Blue Blinker LLC**

*Adjunct Faculty*

**UNC Charlotte | Department of Mechanical Engineering and Engineering Science**

Dr. John Patalak specializes in the fields of occupant crash protection, biomechanical analysis and mechanical engineering. He has extensive experience in accident investigation, occupant safety research & development, crash testing, sled testing, quasi-static testing, vehicle crash databases, experimental design and computer modeling. Over the last 20+ years his career has always focused on occupant safety and injury prevention.

At NASCAR, Dr. Patalak oversees all aspects of driver safety including accident and injury investigations, safety equipment and roll cage rulemaking, equipment research, testing and approvals, computer modeling efforts and the NASCAR crash database. He also creates novel ways of testing unique safety systems at the component and full-scale levels to make engineering recommendations regarding safety devices and systems. Along with using industry standard testing, he has also been able to create unique quasi-static and dynamic tests, some of which have become new industry test standards.

His work at NASCAR has resulted in several patents and many peer reviewed journal publications, some of which have been recognized with awards, including the Society of Automotive Engineers Ralph H. Isbrandt Automotive Safety Engineering Award. Dr. Patalak is a licensed Professional Engineer in North Carolina since 2007 and currently also serves as an FIA research working group member, providing peer review for FIA motorsport safety research.

**Education**

PhD, Biomedical Engineering - Biomechanics, Virginia Tech – Wake Forest University	<i>2015-2019</i>
MS, Biomedical Engineering - Biomechanics, Virginia Tech – Wake Forest University	<i>2015-2017</i>
BS, Mechanical Engineering, The Pennsylvania State University	<i>1997-2001</i>

**Licensure**

Professional Engineer (P.E.), North Carolina – License 033826	<i>2007-Current</i>
NCEES (National Council of Examiners for Engineering and Surveying) Record ID 21-169-82	<i>2020-Current</i>

**Professional Background**

**Vice President, Safety Engineering**

**NASCAR (National Association for Stock Car Auto Racing) – Concord, NC** *2005 – Current*

- Lead Safety Engineering team with integrity to continually pursue improvements, innovation and results.
- Responsible for leading, advocating, designing and conducting crash safety research efforts.
- Research, develop and approve driver and vehicle safety specifications and systems.
- Evaluate and make engineering recommendations regarding submitted safety devices.
- Design, develop and conduct component and full scale quasi-static and dynamic tests.

- Perform failure analysis studies, injury investigations, draft test reports and deliver presentations.
- Design and oversee the development of novel test fixtures, prototypes, inspection equipment and instrumentation.
- Supervise and conduct computer safety modeling efforts.
- Oversee and leverage the crash incident database for internal and external research projects.
- Coordination, communication and implementation of safety improvements to industry manufacturers
- Reviews scientific content and quality of test specifications, safety equipment and data

### **Mechanical Engineer**

ARCCA, Incorporated – Penns Park, PA

2001 – 2005

- Participated in the design, fabrication, setup and execution of frontal, rear and side impact vehicle crash tests and sled tests including data acquisition requirements
- Investigated motor vehicle accidents with regard to vehicle crashworthiness, occupant protection, restraint systems performance and accident reconstruction
- Designed and fabricated test fixtures for seat strength analysis, restraint system performance, head form impacting and human surrogate inversion testing
- Authored quasi-static and dynamic test protocols, reports and presentations
- Performed laboratory and on-site forensic inspections and analysis
- Studied human tolerance historical data and performed human subject quasi-static testing

### **Professional Affiliations**

- Society of Automotive Engineers
- Federation Internationale de l'Automobile (FIA)
- American Society of Mechanical Engineers
- Biomedical Engineering Society
- Association for the Advancement of Automotive Medicine

### **Publications**

Miller, L. E., **Patalak, J. P.**, Harper, M. G., Urban, J. E., and Stitzel, J. D. (December 9, 2022). "Pilot Collection and Evaluation of Head Kinematics in Stock Car Racing." ASME. J Biomech Eng. March 2023; 145(3): 031006. <https://doi.org/10.1115/1.4056322>

William B. Decker, Derek A. Jones, Karan Devane, Fang-Chi Hsu, Matthew L. Davis, **John P. Patalak** & F. Scott Gayzik (2021) Effect of body size and enhanced helmet systems on risk for motorsport drivers, *Traffic Injury Prevention*, DOI: 10.1080/15389588.2021.1977802

William B. Decker, Derek A. Jones, Karan Devane, Matthew L. Davis, **John P. Patalak** & F. Scott Gayzik (2020) Simulation-based assessment of injury risk for an average male motorsport driver, *Traffic Injury Prevention*, DOI: 10.1080/15389588.2020.1802021

**Patalak, J.**, Harper, M., Weaver, A., Dalzell, N., Stitzel, J. "Estimated crash injury risk and crash characteristics for motorsport drivers". *Accident Analysis and Prevention* 2020. doi: 10.1016/j.aap.2019.105397

**John P. Patalak**, Matthew G. Harper & Joel D. Stitzel "Implications of head and neck restraint test repeatability for specification improvement". *Traffic Injury Prevention* 2019, doi: 10.1080/15389588.2019.1633467

**Patalak, J.**, Davis, M., Gaewsky, J., Stitzel, J. et al., "Influence of Driver Position and Seat Design on Thoracolumbar Loading During Frontal Impacts," SAE Technical Paper 2018-01-0544, 2018, <https://doi.org/10.4271/2018-01-0544>.

**Patalak, J.**, Stitzel, J. "Evaluation of the Effectiveness of Toe Board Energy Absorbing Material for Foot, Ankle and Lower Leg Injury Reduction". *Traffic Injury Prevention Journal* 2017. doi: 10.1080/15389588.2017.1354128

**Patalak, J.**, Gideon, T., Melvin, J., and Rains, M., "Improved Seat Belt Restraint Geometry for Frontal, Frontal Oblique and Rollover Incidents," *SAE Int. J. Trans. Safety* 3(2):93-109, 2015, doi:10.4271/2015-01-0740.

**Patalak, J.** and Gideon, T., "Development and Implementation of a Quasi-Static Test for Seat Integrated Seat Belt Restraint System Anchorages," SAE Technical Paper 2015-01-0739, 2015, doi:10.4271/2015-01-0739.

**Patalak, J.**, Gideon, T., and Krueger, D., "Design, Development and Testing of an Improved Stock Car Driver's Window Net Mounting System," *SAE Int. J. Trans. Safety* 2(1):165-181, 2014, doi:10.4271/2014-01-0508.

**Patalak, J.**, Gideon, T., and Melvin, J., "Examination of a Properly Restrained Motorsport Occupant," *SAE Int. J. Trans. Safety* 1(2):261-277, 2013, doi:10.4271/2013-01-0804.

**Patalak, J.** and Gideon, T., "Ballistic Testing of Motorsport Windshields," *SAE Int. J. Trans. Safety* 1(1):127-133, 2013, doi:10.4271/2013-01-0801.

**Patalak, J.** and Gideon, T., "Occupant Rollover Protection in Motorsports," *SAE Int. J. Trans. Safety* 1(2):386-398, 2013, doi:10.4271/2013-01-0800.

Somers, J.T., Melvin, J.W., Tabiei, A., Lawrence, C. Feiveson, A., Ploutz-Snyder, R., **Patalak, J.** "Development of Head Injury Assessment Reference Values Based on NASA Injury Modeling," *Stapp Car Crash Journal*, Volume 55, November 2011, SAE Paper 2011-22-0003,

**Patalak, J.** and Gideon, T., "Quasi-Static Testing of Tubular Roll Cage and Stock Car Chassis Joints," SAE Technical Paper 2011-01-1105, 2011, doi:10.4271/2011-01-1105.

**Patalak, J.**, Gideon, T., Beckage, M., and White, R., "Testing, Development & Implementation of an Incident Data Recorder System for Stock Car Racing," SAE Technical Paper 2011-01-1103, 2011, doi:10.4271/2011-01-1103.

**Patalak, J.** and Melvin, J., "Stock Car Racing Driver Restraint – Development and Implementation of Seat Performance Specification," *SAE Int. J. Passeng. Cars - Mech. Syst.* 1(1):1349-1355, 2009, doi:10.4271/2008-01-2974.

### **Patents**

**Retaining System** (Incident Data Recorder Mounting Shoe), US Patent 666,134, Issued 2012

**Retaining Coupler** (Incident Data Recorder Mounting Shoe), US Patent 656,883, Issued 2012

**Strain Gage Load Cell Anchor** (Seat Belt Load Cell), US Patent 9,580,042, Issued 2017

**Deformable Seat Bracket**, (Seat Mounting) US Patent 797,031, Issued 2017

### **Awards**

- Society of Automotive Engineers - Excellence in Oral Presentation Award – August 2013
- Society of Automotive Engineers – Ralph H. Isbrandt Automotive Safety Engineering Award - 2015