

JOHN C. LAUGHLIN, M.Eng, P.E.

SUMMARY

Mr. Laughlin has spent 17 years working in the field of biomechanical engineering. He has applied engineering principles in the areas of accident reconstruction, injury potential/causation analyses, human factors analyses, failure analysis and medical device engineering. As a forensic engineer, Mr. Laughlin has reconstructed accidents involving automobiles, motorcycles, pedestrians, amusement park rides, walking surfaces, public transportation, and railroad/industrial equipment. He has analyzed failures in products liability cases and determined the relationship of the defect with the injuries. Mr. Laughlin has performed analyses to determine damage consistency between vehicles, the order of impacts in multi-vehicle collisions and to determine the driver of vehicles involved in roll-over collisions, as well as other accident reconstruction related analyses. As a biomechanical engineer, he is qualified to use injury based evidence from medical records, photographs and autopsy reports to create a complete and quality analysis. Mr. Laughlin is a seasoned professional and has testified over 100 times and has been a guest expert on the Dr. Phil show.

Over the course of his career, Mr. Laughlin has worked in the area of orthopedic biomechanics, developing equipment related to the testing of implantable orthopedic medical devices, studying human kinematics, and testing the material properties of human tissue. Mr. Laughlin understands occupant dynamics/kinematics and can reconstruct an occupant's motions during an accident. He is familiar with head injury causation, spinal biomechanics and the biomechanical properties of human tissue including muscle and bone. He understands environmental factors that may contribute to an incident including human factors

Mr. Laughlin is also an accomplished medical device engineer and has experience in the field of neuroelectrical engineering. As a clinical engineer, Mr. Laughlin worked in the field to advance the science of neuromodulation, or the application of electricity to a group of nerve fibers to reach a therapeutic result. Mr. Laughlin comprehends neuroscience principles and the generation/cessation of action potentials with the aid of an applied electrical signal. He has worked closely with research and development departments to advance the design of tools and implantable devices used in the operating room and clinic. He has contributed to the content and design of study protocols used in clinical trials to evaluate the safety and efficacy of medical devices. He has trained surgeon investigators as well as clinical sales teams on the implantation of these devices. Mr. Laughlin is familiar with Investigational Device Exemption (IDE) and Pre-Market Approval (PMA) processes.

Currently, Mr. Laughlin spends most of his professional time reconstructing accidents and performing biomechanical analyses. He is a reviewer for an independent institutional review board. He specializes in evaluating medical device study protocols for their scientific merit and safety prior to being performed on human subjects. With the growing emphasis being placed on human factors, Mr. Laughlin also spends time helping companies design usability studies and designing usability into studies for medical device manufacturers seeking FDA approval.

EDUCATION

Master of Engineering Bioengineering (emphasis in electrical engineering and biomechanics) - Texas A&M University, 1995.

Bachelor of Science Bioengineering (emphasis in electrical engineering and pre-medicine) - Texas A&M University, 1993.

REGISTRATIONS & CERTIFICATIONS

Registered Professional Engineer:

- Texas #92944

PROFESSIONAL ASSOCIATIONS

National Academy of Forensic Engineers, Senior Member

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Society of Automotive Engineers, Member
National Society of Professional Engineers, Engineering Professional Membership
Texas Society of Professional Engineers, Engineering Professional Membership
Texas Gulf Coast Emerging Technology Fund - Gulf Coast Regional Center of Innovation and Commercialization,
Review committee member.

CONTINUING EDUCATION

Courses and Certifications completed in the following:

- Texas A&M University
 - Biomechanics for Collision Reconstruction
 - Traffic Collision Reconstruction
- Mimics Innovation course for Engineering on Anatomy

CAREER HISTORY

FORCON International – Biomechanics Consultant

Provides forensic engineering and expert witness services regarding injury causation analysis, biomechanics, and biomedical devices.

Laughlin Engineering Firm, Houston, TX - Principal Engineer

Mr. Laughlin provided expert engineering analyses in cases involving motor vehicle collisions, injury causation, industrial/railroad accidents, amusement park ride accidents, product liability and premises liability. He performed complex analyses to determine the effects of occupant restraint systems, the driver of a vehicle, and other occupant related analyses. Mr. Laughlin evaluated medical devices and equipment for failures and malfunctions. He is currently a medical device consultant for an independent institutional review board to determine the merit and safety of device oriented clinical trials. Mr. Laughlin also provided human factors engineering services for cases involved in litigation and the design of usability studies for medical device companies.

EnteroMedics, Inc., Minneapolis, MN - Senior Field Clinical Engineer

Mr. Laughlin provided biomedical engineering support to surgeons during the implantation of the MAESTRO system, a fully implantable class III neuromodulation device intended for the treatment of obesity. As a human factors engineer, Mr. Laughlin invented a patent pending device to assess patient compliance prior to enrollment in the Empower clinical trial. The device was responsible for the second largest number of patent exclusions after BMI. He was responsible for the design and implementation of surgeon and clinician training sessions which included laparoscopic implantation in porcine specimens. As a liaison between R&D and the surgeon investigators, Mr. Laughlin facilitated the transfer of clinical and engineering information. He contributed significantly to the continuing development of the MAESTRO system, supported study centers in Norway and Australia and developed analytical tools for analyzing patient data.

Advanced Bionics Corporation, Valencia, CA - Principal Field Clinical Engineer

As a member of the emerging indications department, Mr. Laughlin supported clinical trials involving experimental neuromodulation modalities. He worked with an array of different device designs used to treat several indications including migraine, incontinence, chronic pain, and erectile dysfunction. He provided biomedical engineering support during implant and explant operations. Mr. Laughlin was involved in the development of surgical tools used for the implantation of novel neuromodulation devices. He was responsible for the implementation of surgeon training and experimentation involving human cadaver specimens. He designed and implemented a training program for the European sales team which included both didactic and laboratory training.

Rimkus Consulting Group, Inc., Houston, TX - Senior Accident Reconstructionist and Biomechanical Engineer

As a consultant for one of the world's largest forensic engineering firms, Mr. Laughlin served the insurance and litigation sectors with analyses of accidents and product failures. Mr. Laughlin reconstructed motor vehicle

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accidents, amusement park ride accidents, boating accidents and accidents involving walking surfaces. He has analyzed injury potential/causation in incidents involving railroad equipment, oilfield equipment, children's walkers, and falling objects. He provided support in lawsuits involving patent infringement issues. Mr. Laughlin also analyzed medical device and medical equipment failures.

Cyberonics, Inc., Webster, TX - Clinical Research Engineer

Mr. Laughlin acted as a liaison between clinicians and engineering personnel. He provided engineering support in the operating room to surgeons in IDE study centers in the USA and Canada. He performed statistical analyses on the long term usage data of the NeuroCybernetic Prosthesis. Mr. Laughlin authored two volumes of the PMA submission to the FDA which led to market approval. He managed the data acquisition team and developed software to streamline the validation of clinical data. Mr. Laughlin also provided human factors engineering support and risk analysis for MDR investigations and complaint handling.

Biomedical Device Consultants, League City, TX - Biomedical Engineer

Mr. Laughlin designed and equipment and experiments for testing artificial and bovine arterial grafts. He also implemented a LabView based system for testing the porosity of arterial grafts.

The University of Texas Medical Branch, Galveston, TX - Orthopaedic Biomechanics Fellow

As an orthopaedic biomechanics fellow, Mr. Laughlin performed biomechanical tests on cadaveric specimens to study the kinematics of joints, material properties of tissues and orthopedic surgical techniques. He also supervised medical students and orthopedic residents during research rotations. Mr. Laughlin developed an imaging and analysis system for the strain patterns on bone surfaces using the photoelastic technique and original software programs.

PATENTS

Provisional Patent Application Serial No. 60/941,118, Implantable Therapy System

International Patent Application No. pct/us 2008065386, Implantable Therapy System

PUBLICATIONS

- Laughlin, John, P.E. (NAFE 760S), "Forensic Engineering Investigation of a Police Shooting" Journal of the National Academy of Forensic Engineers, Vol. XXX No. 2 December 2013.
- Grecula, M.J., Morris, R.P., Laughlin, J.C., Buford, W.L., Jr., and Patterson, R.M., "Femoral Surface Strain in Intact Composite Femurs: A Custom Computer Analysis of the Photoelastic Coating Technique", IEEE Transactions on Biomedical Engineering, July 2000.
- Laughlin, J.C., "Analysis Methods for Determining Occupant Dynamics in High Speed Automobile Collisions." Sixteenth Annual Houston Conference on Biomedical Engineering Research, Houston Society for Engineering in Medicine and Biology, 1996.
- Maschino, S, Laughlin, J, "Long Term Follow-Up Study for Protocols E01, E02, E03 and E04 Treatment of Refractory Epilepsy Using Vagus Nerve Stimulation - A Study Managed For Compliance With Good Clinical Practice", November, 1988 to December, 1986, Cyberonics, Inc., PMA Amendment for the FDA approval of the NeuroCybernetic Prosthesis.
- Duffell, W., Laughlin, J, "Long Term (> 3 Months) Follow-Up Study for Protocol XE5 Open Label Treatment of Refractory Partial Onset Seizures Using Vagus Nerve Stimulation", September 1985 to August 1996, Cyberonics, Inc., PMA Amendment for the FDA approval of the NeuroCybernetic Prosthesis.
- Grecula, M.J., Laughlin, J.C., Morris, R.P., Buford, W.L., "Development of a Computer Analysis Technique for Strain Patterns On the Femoral Surface after Total Hip Arthroplasty Using the Photoelastic Method." American Academy of Orthopaedics Surgeons (AAOS), Orthopaedic Transactions, 1997.
- Laughlin, J.C., Grecula, M.J., Buford, W.L., Stark, T., Morris, R.P., "A Photoelastic Study Of Femoral Strain Distributions After Implantation With Various Cementless Hip Stem Designs." Mid-America Orthopaedic Association, Orthopaedic Transactions, 1997.
- Thesis: Laughlin, John: Development of a System for Photoelastic Analysis of Shear Strain Patterns on Bone Surfaces, Texas A&M University, 1996.

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- Laughlin, J.C., Grecula, M.J., Morris, R.P., "Development of a Computer Analysis Technique for Strain Patterns On The Femoral Surface After Total Hip Arthroplasty Using the Photoelastic Method." Fourteenth Annual Houston Conference on Biomedical Engineering Research, Houston Society for Engineering in Medicine and Biology, 1996.
- Laughlin, John: A Wheelchair Triggered Door Opener for a Private Home, National Science Foundation 1993 Engineering Senior Design Projects to Aid the Disabled, North Dakota State University Press.

HIGHLIGHTED AREAS OF EXPERTISE

Mr. Laughlin expertise covers a wide array of specialties including, but not limited to the following areas:

Biomedical/Biomechanical Engineering

- Occupant Dynamics
- Injury Potential/Causation
 - Vehicle Accidents
 - Machinery Usage
 - Railroad Accidents
 - Railroad Equipment
 - Amusement Rides
 - Medical Equipment
 - Sports Equipment
- Seatbelt/Airbag Interaction
- Driver Determination
- Human Factors
 - Visibility
 - Perception/Reaction
 - Ergonomics
- Brain Injury
- Spinal Biomechanics
- Trauma Causation
- Medical Devices
- Hospital Equipment

Accidents/Mechanical Engineering

- Motor Vehicles
 - Multiple Impacts
 - Rollovers
 - Low Speed
 - Order of Impacts
- Damage Consistency
- EDR "Black Box" Download
- Pedestrian Incidents
- Industrial Incidents
- Slips/Trips and Falls
- Amusement Park Rides
- Photogrammetry
- Products Liability