

# Dr. Jason Mazzarella

DC, DAAPM, DCAPM, DAAETS, FIAMA, MVC-FRA, CATSM, CMVT, CPM, CBIS, BSc Kin, BSc HPA

**Excellence in Crash Forensics and Chronic Pain** 

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# Dr. Jason Mazzarella's qualifications regarding Crash Forensics.

Crash forensics medical assessments provides the advantage of a medical opinion (determines injury), a kinesiology opinion (human movement), an accident reconstruction opinion (Toronto Police ACR) and a injury risk opinion (crash forensics certification - live full scale human testing).

Previous ideology equated force with injury potential. Engineers would determine force and that force would be used to determine injury potential. From here an engineer would rely on previous medical evidence and reported diagnosis to attempt to make a conclusions of injury potential. However this is a poor and potential highly liable way to approach an injury due to a motor vehicle accident.

First, forces are variable, ACR's and engineers are able to provide extremely scientific mathematical equations in order to determine force value. However, the variables used to determine force are highly unreliable at best as the entire science of ACR is based on least possible (as this was developed in order for law enforcement to place fault, not in order to determine injury). It does not consider highest force possible, peak force possible or risk factors that would contribute to increase or mitigate force and thus is only one part of an injury potential determination. Furthermore, research has shown injuries can occur at Delta V's as low as 2.5 mph's. Lastly, research has shown that occupant's subject to the same forces, and similar collision vectors present with varying injuries or no injuries when compared to each other. This all supports the need to be able to correlate risk factors with occupant kinematics in order to determine an injury potential that is reliable and highly defensible.

Secondly, a recent Divisional court ruling (June 20, 2013) described changes in regards to expert testimony. One of these changes included the court finding that a diagnosis does not equate to a fact. For this reason alone, the usage of an engineer is no longer viable in regards to injury as they rely on medical documentation for a diagnosis and can not provide a diagnosis themselves.

http://www.lawtimesnews.com/201307013315/headline-news/court-provides-badly-needed-guide-on-dutiesof-treatment-providers



#### Testing: Accident Reconstruction and Investigation

- Mock fatal Pedestrian Collision
- Mock fatal Pedestrian Collision

At Sce

Analysis

Analysis

- Dynamic Field Testing, Coefficient of Friction, Skid Distance and Speed Analysis
  - 4 wheel independent skid mark test

    - Vehicle Yaw Test

#### - Bumper Damage Analysis

- - Full brake overlapping skid mark with shot marker test
  - Rear brake motorcycle skid mark test
  - Rear brake skid mark test

Accident Investigation

Allows for - At scene investigation - Skid Mark Analysis - Crush Analysis

Analysis

- Northwestern University Accident Investigation Accident Reconstruction - CATAIR / Toronto Police
 EDR Analyst - CATAIR / Crash Data Group
 EDR Retrieval - CATAIR / Crash Data Group

- Human Factor Analysis - Kene Measurements and Photographs - General Speed Estimates - Can also include EDR Download Reports and

#### Chiropractic Doctor

- Allows for Physical Examination, review of medical records, lab tests and special imaging tests and then determines if there is a correlation of forces involved in the collision compared to patient presentation.
   Motor Vehicle Crash Forensic Risk Analysis Cert.
   Whiplash & Brain Traumatology
   Deip Diement Pain Diplomat - Traumatic Stress Diplomat
- Certified Brain Injury Specialist Harvard Radiology/John Hopkins MRI





#### BSc. Kinesiology Movement Science Interdisciplinary training that utilizes movement

for diagnosis, rehabilitation, and/or theoretical study. Allows for correlation of forces involved in the

collision to occupant kinematic reaction during a crash

Includes changes of occupant reaction due to risk factor involvement, including crash vector, occupant position and awareness.

# Motor Vehicle Crash Forensics Risk Analysis Certification

Live full scale human volunteer crash testing and high speed Bio-Rid dummy crash testing.
 Allows for injury biomechanics and occupant kinematic knowledge in response:
 Collision Vector, Vehicle Factors, Risk Factors and PDOF

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#### Testing: Live Full Scale Human Volunteer Crash Testing and High Speed Bio-Rid Dummy Vehicle and Pedestrian Crash Testing

- Pedestrian Vehicle Deceleration Crash Testing
- Pedestrian Vehicle Acceleration Crash Testing
- Low Speed Human Volunteer Rear and Offset Rear Impact Collision Testing
  Low Speed Human Volunteer Near Side and Offset Side Impact Collision Testing
- Low Speed Human Volunteer Frontal and Offset Frontal Impact Collision Testing
  Low Speed Human Volunteer Far Side and Offset Side Impact Collision Testing
- High Speed Bio-Rid Dummy Frontal, Rear and Side Impact Collision Testing
  Crush Analysis Correlation to Injury Testing, Side, Frontal and Rear Impact
- Bumper Damage Analysis Correlation to Injury Testing Rear and Frontal Impact

# Key educational and training background:

# **Medical Education:**

#### **Doctor of Chiropractic (DC)**

New York Chiropractic College, Seneca Falls, NY

Includes 5040 Contact Hours. Topics Include:

Anatomy, Cadaver Dissection, Cell and Tissue Biology, Cell Physiology, Neurology, Biochemistry, Biochemistry of Nutrition and Herbs, Nutrition, Physiotherapy, Microbiology, Public Health, General Diagnosis, Diagnosis and Management of Spinal Conditions, Diagnosis and Management of Extremity Conditions, Patient Assessment, Soft Tissue Techniques, Diabetes, Diagnostic Imaging (X-ray, MRI and CT), Clinical Psychology, Concepts in Pharmacology, Hospital Procedures and Protocol, Clinical Laboratory, Associated Studies, Elite Sports Science, Sports Medicine, Philosophy, Ancillary Therapeutic Procedures, Kinesiology, Patient Communication, Clinical Practice, Outpatient Services, Technique, Electrodiagnosis, Ethics and Law

#### Whiplash and Brain Traumatology post graduate training

40+ continuing education courses, over 400 hours.

Development of a Post Graduate Whiplash Traumatology Seminar Series endorsed by University of Buffalo School of Medicine, National University of Health Sciences, American Chiropractic Association and the American Academy of Family Physicians.

2 Diplomats in Pain Management, 1 Certification in Pain due to Traumatic Stress and over 80+ continuing education courses.

Certified Brain Injury Specialist, AABIS

#### **Biomechanics Education:**

Bachelor of Science (BSc.)

Pennsylvania State University, State College,

B.S., Kinesiology Movement Science

Includes: Movement Bioscience, Movement Forms, Functional Human Anatomy, Psychology of Movement Behavior, Exercise Physiology, Neurobiology of Motor Control and Development, Biomechanics, Movement Disorders and Science of Training Athletes.

#### Certified Kinesiologist (CK)

Ontario Kinesiology Association, Mississauga Ontario Canada August 2009 – May 2012

The practice of Kinesiology is the assessment of human movement and performance and its rehabilitation and management to maintain, rehabilitate or enhance movement and performance. Certification requirements includes completion of a 4 year degree in Kinesiology and approval by the OKA Board after review of Transcripts.

### **Accident Reconstruction Education**

# Crash Investigation 1

Northwestern University of Public Health

Includes 80 contact hours of training. Topics include: Preparation for traffic crash investigation, information from and about people, information from vehicles, information from roads, measuring and mapping the crash scene and photographing the crash scene and damaged vehicles.

#### Accident Reconstruction Level 2 (Level 2 Reconstructionist)

Toronto Police College

Includes 80 contact hours of training. Topics include: Drag Factor determination and Grade Evaluation, Speed Distance Determination, Skid to Stop distance, Negative Skid to Stop Distance Determinations, Roadway Evidence, Scaled Diagrams, At Scene Accident Photography, Dangerous Goods, Time Distance Measurements, Restraint System Evaluation, Tire Mark Evaluation (Skid Marks, Tire Marks, Imprints, Yaw Marks), Interview Techniques, Series of Events, and Vehicle Dynamics.

# Accident Reconstruction Level 3 (Level 3 Reconstructionist)

Toronto Police College

Includes 80 contact hours of training. Topics include: Drag Factor determination, Grade and Super Evaluation determination, Speed Distance Determination, Skid to Stop distance, Negative Skid to Stop Distance Determinations, Roadway Evidence, Scaled Diagrams, Fall, Flip and Vault speed calculations, Yaw speed calculations, critical curve speed analysis, Dynamic testing, Vehicle Dynamics, Radius Determination, Lamp Examination, Tire Examination, Pedestrian Collision, Systematic Collision Investigation, Crush Analysis, Commercial Motor Vehicle Examination, Motorcycle Collision Analysis, Mock Fatal Crash Test.

#### Crash Data Retrieval System Operators (Technician) Certification

Canadian Association of Technical Accident Investigators and Reconstructionist (CATAIR) endorsed by Accreditation Commission for Traffic Accident Reconstruction (ACTAR).

Training includes: CDR system components, vehicle coverage, software operations and data collection.

#### **Crash Data Analysis and Applications Certification**

Canadian Association of Technical Accident Investigators and Reconstructionist (CATAIR) endorsed by Accreditation Commission for Traffic Accident Reconstruction (ACTAR).

# **Biomechanics and Occupant Kinematics Practical Education:**

#### Certification in Motor Vehicle Crash Forensic Risk Analysis (MVC-FRA)

Spine Research Institute of San Diego, San Diego California August 2006

Comprehensive training program and qualifying exam topics include: principles of auto crash reconstruction, human subject crash testing/occupant kinematics, pedestrian crash reconstruction, the latest in human anatomical research and injury biomechanics, current methodologies and strategies in injury prevention using design engineering, motor vehicle injury diagnostic and non-invasive and invasive clinical management methods, soft tissue injury referral patterns and pain management.

# Testing: Live Full Scale Human Volunteer Crash Testing and High Speed Bio-Rid Dummy Vehicle and Pedestrian Crash Testing

- Pedestrian Vehicle Deceleration Crash Testing
- Pedestrian Vehicle Acceleration Crash Testing
- Low Speed Human Volunteer and Bio-Rid Dummy Rear End Collision Testing
- Low Speed Human Volunteer and Bio-Rid Dummy Rear End Offset Collision Testing
- Low Speed Human Volunteer and Bio-Rid Dummy Front End Collision Testing
- Low Speed Human Volunteer and Bio-Rid Dummy Front End Offset Collision Testing
- Low Speed Human Volunteer and Bio-Rid Dummy Near Side Collision Testing
- Low Speed Human Volunteer and Bio-Rid Dummy Near Side Offset Collision Testing
- Low Speed Human Volunteer and Bio-Rid Dummy Far Side Collision Testing
- Low Speed Human Volunteer and Bio-Rid Dummy Far Side Offset Collision Testing
- High Speed Bio-Rid Dummy Near and Far Side Collision Testing
- High Speed Bio-Rid Dummy Front End Center and Offset Collision Testing
- High Speed Bio-Rid Dummy Rear End Center and Offset Collision Testing

#### Testing: Accident Reconstruction and Investigation

- Mock fatal Pedestrian Collision
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- Dynamic Field Testing: Coefficient of Friction, Skid Distance, and Speed Analysis
  - 4 Wheel Independent Skid Mark Test
  - Full Brake Overlapping Skid Mark Test with Shot Marker Test
  - Rear Brake Motorcycle Skid Mark Test
  - Rear Brake Skid Mark Test
  - Vehicle Yaw Test, with Critical Curve Speed Analysis

### Whiplash and Injury Diagnosis Practical Education:

#### Buffalo New York Veterans' Hospital, Buffalo, NY

Chiropractic Internship

As chiropractic intern my responsibilities included, patient management, scheduling, treatment, evaluation, and assessment of all patients seen in the chiropractic office.

#### Buffalo New York Veterans' Hospital, Buffalo, NY

Orthopedic Internship

As a student intern in orthopedics, my responsibilities included, entering patient data, physical assessment of knee and hip pathologies, and coordination of all patient consultations during that day.

#### United States Olympic Training Committee, Lake Placid, NY

Student Rotation – Sports Medicine Symposium

Participated in sports science rehabilitation rotation discussing topics of elite athlete rehabilitation including education or core exercise rehabilitation including the principles of training theory. This rotation allowed for 16 contact hours of credit.

#### **Clinical practice:**

Since graduation I have assessed, diagnosed and treated approximately 6,000 patients.

Since graduation I have preformed approximately 5000 independent medical assessments involving motor vehicle trauma patients, chronic pain patients and brain injury patients.

### How can this service be used?

- **1. Determine extent of injury due to motor vehicle accident.** During a crash different forces will act on different body regions. Up to 6 forces can act on the occupants cervical spine (neck) in a motor vehicle collision. The type of forces present will dictate what injury can occur in the crash. Research has shown that muscle injuries generally take up to 21 days to heel. Ligaments and tendons take longer and facet joints are the primary cause of chronic pain development. By determining the forces involved in the collision and correlating this to potential tissue damage a determination of treatment need and benefit need can be made based on science, research and clinical experience.
- **2. Determine the validity of a claim.** At times there can be a dispute between both plaintiff and defense lawyers regarding the both the types of injuries and severity of injuries which could occur in a given crash. Crash forensics assessments can determine what injuries could have occurred through occupant kinematics knowledge in combination with risk factors and human factors. This can help to determine if the claim is valid, i.e. is the reported impairment due to the motor vehicle accident. Once the validity of the claim is determined, benefit appropriateness and need can be determined based on the structures determined to be injured if any.

For more information about CRASH FORENSICS please feel free to <u>contact Dr. Mazzarella at</u> 647-991-7246