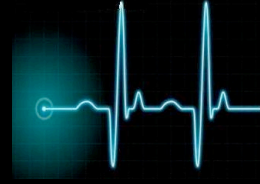




# Dr. Jason Mazzearella

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

Excellence in Crash Forensics and Chronic Pain



Tel Ca: (647) 991-7246

| Email: [DoctorMazz@gmail.com](mailto:DoctorMazz@gmail.com)

| Website: [www.Drmazzearella.com](http://www.Drmazzearella.com)

## Crash Forensics Press Release

### Local Doctor Becomes Motor Vehicle Crash Forensic Risk Analysis Certified at CRASH International Whiplash Conference



#### Crash Forensics Background:

Dr. Jason Mazzearella says consumers and healthcare providers need to be better educated about the issue surrounding whiplash—both concerning its diagnosis, treatments and, importantly, its prevention. In order to more effectively treat and assess persons injured in motor vehicle crashes, Dr. Mazzearella became certified in Motor Vehicle Crash Forensic Risk Analysis at the CRASH 2006 International Whiplash Conference in San Diego, California.

The research agenda for CRASH 2006 included full-scale live crash testing with both human subjects and high-tech crash test dummies in multiple low-speed crash tests. These crashes were created and analyzed, along with several other projects, in order to improve our understanding of injury mechanism and occupant kinematics that occur during both low and high speed collisions from a multitude of different collision vectors.

As part of this intensive program, Dr. Mazzearella also learned the very latest methods of forensic risk analysis to better understand not only the effects of the forces and loads imposed upon patients' spines and brains in both high and low speed crashes, but also the various risk factors that can increase a person's chance for injury or long-term symptoms.

"By understanding the unusual biomechanics of this form of trauma, diagnostic methods and treatment need can be determined more effectively through the knowledge of injury potential and correlation of injury potential to report of injury sustained," said Dr. Mazzearella

An evaluation of Event Data Recorders (EDR) - the car's "black box," and how it performs in low velocity crashes, and a comparison of Saab's new anti-whiplash head restraint seat with standard car seat using human volunteer subjects in full scale car-to-car crash tests was also part of the program.

Dr. Mazzearella keeps current on whiplash, pain, brain injury and forensics research by reading approximately 500 new research articles a year and attending a multitude of post graduate courses (over 80 Pain Management, over 40 Motor Vehicle Trauma courses to date), allowing him to stay in the forefront of injury biomechanics, crash forensics, whiplash evaluation, diagnosis, and treatment. Dr. Mazzearella has over 320 additional training hours in accident investigation, reconstruction, event data recorders, has completed approximately 5000 medical IME assessments to date. In addition, clinically he has treated approximately 6000 patients with conditions ranging from whiplash, chronic pain and brain injury to performing pre/post surgical rehabilitation and amputee desensitization therapies. This training allows for a research and clinical based determination of need based on patient treatment experience in practice combined with knowledge of the most up to date research in whiplash, crash forensics, injury biomechanics and chronic pain.



### **How Does Crash Forensics Assessments Work?**

Crash Forensic is a medical service that allows for an injury determination through the use of physics, science, occupant kinematics, and other crash variables including collision vector, risk factors, and principle direction of force. In a motor vehicle crash, the body's response to the biomechanics of whiplash is determined by certain risk factors and crash variables which are dependent of the forces involved in the collision (flexion, extension, shear, torque, compression and distraction). If the doctor you choose is correctly trained to review all of these factors an injury potential can then be determined based on the known occupant reaction to the specific forces involved in the collision in combination with vehicle factors and risk factors.

Once this injury potential determination is produced, a comparison of tissue injury can be completed to see if the known injury potential of the motor vehicle collision correlates to the reported injury sequela. This determination can then be used to make a scientific, researched based, impartial, accurate and defensible determination of benefit need.



### **How do I choose and expert?**

An expert is required when a traumatic event occurs in which two parties disagree regarding the extent of the trauma and subsequent benefit need.

A traumatic event in regards to a motor vehicle trauma is when forces experienced by an occupant during the various stages of a collision exceed or are greater than what is tolerable for specific body regions. These forces can cause minor to catastrophic injury, unfortunately due to the nature of the injuries sustained, current technologies today are not sensitive enough to detect some of these types of injuries.

- Nordhoff LS: Motor Vehicle Collision Injuries. Biomechanics, Diagnosis, and Management. Second Edition. Mississauga Ontario Canada 2005.

For this reason, an expert must have both a biomechanical and medical background which allows for an analysis of injury mechanisms as well as an appreciation of bodily structures, these structures relation to function and pain.



## Biomechanics

Biomechanics as related to motor vehicle trauma applies to the examination of internal and external mechanical forces acting on a biological system during a crash. Biomechanical experts are commonly used to tie the accident reconstruction aspects of a collision to a physician's diagnosis. However, as biomechanists lack the training or license to make a formal diagnosis, as this would be a practice of medicine without a license, many courts have not allowed biomechanists to comment on diagnosis and thus injury.

- Nordhoff LS: Motor Vehicle Collision Injuries. Biomechanics, Diagnosis, and Management. Second Edition. Mississauga Ontario Canada 2005.

In regards to the **"biological" portion of the field of biomechanics**, an expert should have a vast array of training as humans are diverse and anatomical variations are quite common.

Specific training should include but not be limited to:

1. Formal university and graduate course work in Anatomy including cadaver dissection (essential to appreciate anatomical variations from person to person).
2. Formal university and graduate functional anatomy course work. This course work should educate the person on what happens to anatomical structures within the human frame when they move through various stages of motion specific to a motor vehicle crash. In general kinesiology is an excellent university/graduate program which allows for education in joint movement through various stages of motion. This study would also allow for a general knowledge basis of what muscles are active in various motions and the roles of ligaments, muscles and tendons in motion actions.
3. Training in human factors which increase a person's susceptibility to injury.
4. Clinical experience observing occupants in crash tests or crash test dummies in impacts of various speeds and collision vectors. There are over 20 types of crash test dummies, and though test information obtained from the usage of these dummies help to expand our knowledge of injury mechanisms and potentials, live full scale human volunteer crash testing is the gold standard in order to truly understand the occupant reaction that occurs in varying vector collisions and high and low speeds.
5. Real world experience. Though not a specific requirement, anyone can read a book or paper and render an opinion. This opinion is only an expert opinion when it can be based on both academic and clinical experience.

- Nordhoff LS: Motor Vehicle Collision Injuries. Biomechanics, Diagnosis, and Management. Second Edition. Mississauga Ontario Canada 2005.

The **mechanical portion of a biomechanists training** in regards to motor vehicle trauma should include the following knowledge and training.

1. Significance of calculated delta-V of the occupant's vehicle from the reconstructionist.
2. Collision dynamics, angle of impact and PDOF relative to how the occupant's body would react and move inside/outside of the vehicle.
3. Duration of impact knowledge and the importance of time in regards to injury causation. In addition, how PDOF, vehicle motion and impact type (collision vector) can significantly affect time elements during a crash.

4. Photography usage of occupant's in a vehicle to analyze position relative to the interior of the vehicle and the striking vehicle. Without inspection of the occupant in the vehicle, risk cannot be completely evaluated.

- Nordhoff LS: Motor Vehicle Collision Injuries. Biomechanics, Diagnosis, and Management. Second Edition. Mississauga Ontario Canada 2005.

The field of biomechanics is very broad, with mechanical engineers, physics, kinesiology, mathematics, biomedical engineering, biomechanics, accident reconstructionist and doctors (medical and chiropractic) attempting to act as experts. **The above qualifications should be a starting point for your expert, not an ending point.** In addition to the above mentioned, an expert should consider a number of other collision variables and human factors to lengthy to discuss in this short press release.

How are Biomechanists used?

1. Convince a jury or arbitrator that the forces experienced in a specific region of the body (by determine delta V) of the collision (based on accident reconstruction) was or was not sufficient to cause injury.
2. If considering contribution to negligence, a biomechanists can be used to determine if a seatbelt was on or off and what injuries could have occurred dependent on the situation.
3. Equate the forces involved in the collision to general activities of daily living. \*This however does not consider time or pain.

- Nordhoff LS: Motor Vehicle Collision Injuries. Biomechanics, Diagnosis, and Management. Second Edition. Mississauga Ontario Canada 2005.



### **Accident Reconstructionist**

Auto crash reconstructionist are (usually) specially trained people (mostly police officers) who can frequently determine causation of an accident using a number of sophisticated and, frequently, ingenious methods. Accident reconstruction requires the gathering of tangible evidence collected at the accident/crash scene in order to determine specifics about the crash. This evidence might include a scaled police drawings of the crash scene, eye witness accounts of the collision, photographs of the collision, actual inspection of the involved vehicles, or photographs of the crash scene showing skid marks, tire marks, gouges in the roadway, debris, body fluids etc. The quality of the outcome of these reconstruction reports parallels the quality of the input of information gathered and collected at the collision scene, and this becomes a defining statement in accident reconstruction.

- Foreman SM, Croft AC: Whiplash Injuries. The Acceleration / Deceleration Syndrome. Third Edition. Philadelphia United States 2002.

In regards to training, an expert should have accident investigation and accident reconstruction training that should include:

At Scene Investigation	Vehicle Dynamics	Speed Determination	Human Factor Analysis	Evidence Retrieval and Analysis
Series of Events	Tire Evaluation	Slide to Stop	Crash Causation	Event Data Recorder
Roadway Evidence and Analysis	Restraint System Evaluation and Analysis	Negative Slide to Stop	Series of Events	Retrieval and Analysis
Drag Factor / Coefficient of Friction Analysis	Braking Efficiency	Time Distance	Crash Fault Determination	
Forensic Mapping	Lamp Examination	Critical Curve Speed Analysis	Crash Awareness Analysis	
Scaled Diagrams	Pedestrian Collision	Yaw Speed Analysis		
Scene Grade Analysis	PDOF, Force Determination	Acceleration Analysis		
Scene Superelevation Analysis	Vehicle Crashworthiness			
At Scene Photography	Bumper Standards Analysis			
Systemic Collision Investigation	Roof Crush Analysis			

The field of accident reconstruction is very broad, with mechanical engineers, physics, biomedical engineering, biomechanics, accident reconstructionist and doctors (medical and chiropractic) attempting to act as experts. **The above qualifications should be a starting point for your expert, not an ending point.**

How are Accident Reconstructionist used?

1. Describe events leading up to the collision.
2. Opinion of if an injury is possible. \* Due to the complexity of the human body, pain processing and risk factors, though ACR's can attempt to describe a possible injury due to forces found to have occurred during the collision, caution must be used as variables can exist which can result in changes in injury patterns not expected with general PDOF calculations. The best example is a coup counter coup head injury. An ACR could determine contact with the occupant's head and vehicle, however they would not be able to evaluate the occupant to see if the opposite side of the head was injured, or if a pressure gradient change occurred causing deeper brain lesions.

## Doctor (Medical or Chiropractic)

Determination and diagnosis of a persons injury presentation is an inherent part of managing a motor vehicle collision and resulting benefit need determination. This starts with the history and examination of a patient. A proper diagnosis is a guide to treatment need, and allows for the best possible chance for patient recovery to occur. In addition, an examination allows for underlying pathology to be ruled out.

There is no typical patient and there is no typical crash. For this reason generalized ideas of anatomy or a basic understanding of anatomy can not equate to the ability to make an injury determination. As noted above, a minimum standard in regards to training would include formal university and graduate course work in Anatomy including cadaver dissection (essential to appreciate anatomical variations from person to person), Neurology including understanding of neurological signs and/or symptoms, Orthopedic testing allowing for a structure specific injury determination to be made and general pain concepts including referral patterns. Furthermore, the evaluator has to be aware of red flags and risk factors associated with the patient which can influence the traumatic event by either mitigating or exacerbating injury potentials.

The **doctors training** in regards to motor vehicle trauma should include knowledge in the following area's.

1. Injury pathophysiology obtained through specific whiplash traumatology post graduate CE course work.
2. Anatomy including cadaver dissection
3. Neurology including understanding of neurological pathology and testing procedures.
4. Orthopedic Testing including ability to differentiate between soft tissue structures in the same anatomic region.
5. Soft Tissue understanding including ability to determine Referral Patterns, differentiate between tissues depending on fiber orientation and innervation knowledge.
6. Concussion Testing. Motor vehicle trauma results in over 30% of reported head injuries with three primary injury mechanisms. Simply being able to report the direction of force relating to the occupants head movement is not sufficient in evaluating a possible injury potential.
7. Brain Stem Testing
8. Dorsal Column Testing
9. Pain Concepts and Syndromes Knowledge
10. Special Condition knowledge (TOS, CTS, etc)
11. Understanding of complicating factors
  - a. Age
  - b. Gender
  - c. Systemic Disorders
  - d. Congenital Abnormalities
  - e. Degenerative Disc Disease
  - f. Spondylosis
  - g. Facet Arthrosis
  - h. Prior Injury/Surgery
  - i. Prior Medical Condition
12. Special Imaging (x-ray, MRI, CT) and lab testing knowledge
13. Rehabilitation and treatment protocols



The authors of the Quebec Task Force on Whiplash Associated Disorders, published in Spine supplement edition April 1995 indicated that whiplash is not taught in medical school, chiropractic school, occupational therapy or physical therapy school and that voluntary post graduate education is required in order to have a basic understanding of whiplash.

Typical providers which can evaluate whiplash injury include, ER Physicians, General Practitioners, Internist, Chiropractors, Physical Therapists, Orthopedist, Diagnostic Radiologist, Neurologist, Anesthesiologist, Dentist, Occupational Therapist, Osteopath, and Psychotherapist. Please note that those these providers have a basic understanding of medical concepts listed above, secondary voluntary post graduate training is required in order to provide expert opinion of need related to motor vehicle trauma, as injury mechanisms are unique and dependent on occupant and crash variables.

How are Doctors used?



1. Determine injury
2. Determine benefit need (including treatment).
3. Determine long term future care need (if any).



### **Dr. Jason Mazzearella'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-duties-of-treatment-providers>



#### Human Factors Analysis

- Crash Causation
- Series of Events
- Crash Fault Determination
- Crash Awareness Analysis

#### At Scene Investigation

- Series of Events
- Road way Evidence and Analysis
- Drag Factor / Friction Coefficient Analysis
- Forensic Mapping
- Scaled Diagram
- Scene Grade Analysis
- Scene Superelevation Analysis
- At Scene Photography
- Systematic Collision Investigation



#### Vehicle Dynamics

- Tire Evaluation
- Restraint System Evaluation and Analysis
- Braking Efficiency
- Lamp Examination
- Pedestrian Collisions
- PDOF, Force Determination
- Vehicle Crashworthiness
- Bumper Damage Analysis



## Occupant Kinematics and Injury Biomechanics

#### Collision Vector Analysis and Injury Potential Determination

- Injury Biomechanics and occupant reaction based on PDOF
- Occupant Kinematic Response due to vehicle and restraint interactions.
- Analysis of injury biomechanics in combination with know risk factors in order to determine injury potential
- Acute Injury Risk
- Chronic Injury Risk
- Injury Severity Determination
- Long Term Symptom Outcome
- Physical Exam Correlation

#### Speed Determination

- Slide to Stop
- Negative Slide to Stop
- Time Distance
- Critical Curve Speed Analysis
- Yaw Speed Analysis
- Acceleration Analysis

#### Evidence Retrieval and Analysis

- Event Data Recorder
- Retrieval
- Analysis

#### Testing: Accident Reconstruction and Investigation

- Mock fatal Pedestrian Collision
- Mock fatal Pedestrian Collision
- Dynamic Field Testing, Coefficient of Friction, Skid Distance and Speed Analysis
  - 4 wheel independent skid mark test
  - Full brake overlapping skid mark with shot marker test
  - Rear brake motorcycle skid mark test
  - Rear brake skid mark test
  - Vehicle Yaw Test

#### 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

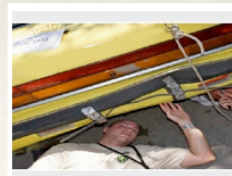


#### Accident Investigation

- Northwestern University Accident Investigation
- Accident Reconstruction - CATAIR / Toronto Police
- EDR Analyst - CATAIR / Crash Data Group
- EDR Retrieval - CATAIR / Crash Data Group
- Allows for
  - At scene investigation
  - Skid Mark Analysis
  - Crush Analysis
  - Human Factor Analysis
  - Scene Measurements and Photographs
  - General Speed Estimates
- Can also include EDR Download Reports and Analysis

#### 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
- 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

[www.DrMazzarella.com](http://www.DrMazzarella.com) Tel: (647) 991-7246

# Forensic Injury Biomechanics





## **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
- Mock fatal Pedestrian Collision
- 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 heal. 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 [contact Dr. Mazzarella at 647-991-7246](mailto:Dr.Mazzarella@647-991-7246)**