



CURRICULUM VITAE
J. MICHIO CLARK

EDUCATION

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| 2019 | PHD | UNIVERSITY COLLEGE DUBLIN – DUBLIN, IRELAND Mechanical Engineering; Biomechanics (Marie-Curie ITN) |
| 2015 | MSC | UNIVERSITY OF OTTAWA – OTTAWA, ONTARIO, CANADA Human Kinetics; Biomechanics |
| 2013 | BSC | BROCK UNIVERSITY – ST. CATHARINES, ONTARIO, CANADA Honours in Kinesiology (First Class Standing) |

PROFESSIONAL EXPERIENCE

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| 2019 – DATE | VECTOR SCIENTIFIC, INC. <i>Biomechanical Engineer / Research Investigator</i> <i>Injury Biomechanics</i> |
| 2019 | GTD SCIENTIFIC, INC. <i>Contract Biomechanist</i> |
| 2019 | UNIVERSITY OF OTTAWA <i>Research Assistant – National Operating Committee on Standards for Athletic Equipment</i> <ul style="list-style-type: none">• Collection of head impact data using three-dimensional acceleration test protocols, video analysis, and brain trauma profiling related to brain injury mechanisms in American youth football |
| 2015 – 2019 | UNIVERSITY COLLEGE DUBLIN <i>Early Stage Researcher – European Union’s Horizon 2020 Marie-Curie Innovation Training Network, HEADS</i> (Head protection: a European training network for Advanced Designs in Safety) with Industrial Partners Irish Horseracing Regulatory, Board British Horseracing Authority, British Eventing, British Trade Association, Charles Owen <ul style="list-style-type: none">• Collection and analysis of brain injury data using three-dimensional acceleration test protocols that reflect the mechanisms of brain injury within sport• Collection and analysis of helmet damage sustained from real world accidents• Brain injury reconstruction using video analysis, Hybrid III, MADYMO, and FEA• Creation of a publicly available database pertaining to impact parameters, head kinematics, brain tissue responses, and helmet damage sustained from real-world equestrian accidents• Deliverable reports to European Commission and public dissemination of research at University, National, and International events for audiences ranging from children to academics and governing bodies |

2015 – 2018 UNIVERSITY COLLEGE DUBLIN

Teaching Assistant

- Conducted labs in courses Mechanics for Engineers and Design and Materials
- Taught 1st and 2nd year laboratories and tutorials in mechanical engineering theory and application of software such as ArchiCAD and Autodesk Inventor

2014 – 2015 UNIVERSITY OF OTTAWA

Research Assistant – CCM Reebok

- Project Lead and data manager for large lab-based research project involving brain injury reconstructions
- Collection and analysis of brain injury data using three-dimensional (linear and rotational acceleration) test protocols that reflect the mechanisms of injury within sport
- Video analysis of sporting events resulting in concussion
- Brain injury reconstruction of sport and hospital cases using Hybrid III, MADYMO, and finite element models
- Analysis of data from brain injury reconstructions using finite element modelling

2013 – 2015 UNIVERSITY OF OTTAWA

Teaching Assistant

- Conducted labs in courses Musculoskeletal Anatomy, Introduction to the Biomechanics of Human Movement, Laboratory Techniques in Exercise Physiology and Biomechanics, and Psychomotor Behaviour Laboratory
- Taught 1st, 2nd, and 3rd year laboratories in theory and application of biomechanical and psychomotor behaviour principles

2013 IMPAKT PROTECTIVE, INC.

Student Intern

- Lead designer for a pendulum impactor and sliding table for use in helmet based concussion sensor research
- Research assistant for a Youth Football Study – NCAFA (Ottawa)

SCIENTIFIC JOURNAL REVIEWER

Annals of Biomedical Engineering

Biophysica

Computer Methods in Biomechanics and Biomedical Engineering

International Journal of Environmental Research and Public Health

Journal of Biomechanics

Journal of Sport Rehabilitation

Life

PUBLICATIONS

Doctor of Philosophy (PhD) Thesis

Clark JM. (2019). In-depth analysis and reconstruction of equestrian jockey accidents and their helmets. University College Dublin.

Master of Science (MSc) Thesis

Clark JM. (2015). Evaluation of the protective capacity of ice hockey goaltender masks for three accident events using dynamic response and brain stress and strain. University of Ottawa.

Articles Published in Refereed Journals

Clark JM, Connor TA, Post A, Hoshizaki TB, Gilchrist MD. (2021). The influence of impact surface on head kinematics and brain tissue response during impacts with equestrian helmets. *Sports Biomechanics*. 20(6), 737-750.

Clark JM, Adanty K, Post A, Hoshizaki TB, Ni Annaidh A, Gilchrist MD. (2021). A parametric analysis of factors that determine head injury outcomes following equestrian fall accidents. *International Journal of Crashworthiness*. 26(3), 295-308.

Connor TA, Clark JM, Stewart M, Ni Annaidh A, Gilchrist MD. (2021). Post-accident evidence basis for new equestrian standards: Relationship between helmet liner residual crush and accident parameters. *Applications in Engineering Science*. 100044.

Clark JM, Williams C, Clissold J, McGoldrick A, Hill J, Ni Annaidh A, Gilchrist MD (2020). Video analysis of head injuries incidents in equestrian sports. *Sports Engineering*. 23, 1-9.

Clark JM, Hoshizaki TB, Ni Annaidh A, Gilchrist MD. (2020). Equestrian helmet standards: Do they represent real-world accident conditions? *Annals of Biomedical Engineering*. 48(8), 2247-2267.

Connor TA, Clark JM, Brama P, Stewart M, Ni Annaidh A, Gilchrist MD. (2020). An evidence basis for future equestrian helmet lateral crush certification tests. *Applied Sciences*. 10(7), 2623.

Trotta A, Clark JM, McGoldrick A, Ni Annaidh A, Gilchrist MD. (2020). Biofidelic finite element modelling of brain trauma: Importance of the scalp in simulating head impact. *International Journal of Mechanical Sciences*. 173, 105448.

Clark JM, Connor TA, Williams C, Clissold J, McGoldrick A, Hill J, Ni Annaidh A, Gilchrist MD. (2020). Analysis of helmet damage caused during real-world equestrian fall accidents while racing. *Journal of Testing and Evaluation*. 48(3), 2185-2195.

Clark JM, Connor TA, Post A, Hoshizaki TB, Ni Annaidh A, Gilchrist MD. (2020). Could a compliant foam anvil characterise the biofidelic impact response of equestrian helmets? *Journal of Biomechanical Engineering*. 146(6), 061006.

Clark JM, Adanty K, Post A, Hoshizaki TB, Clissold J, McGoldrick A, Hill J, Ni Annaidh A, and Gilchrist MD. (2020). Proposed injury thresholds for concussion in equestrian sports. *Journal of Science and Medicine in Sport*. 23(3), 222-236.

Clark JM, Hoshizaki TB, Gilchrist MD. (2020). Event-specific impact test protocol for ice hockey goaltender masks. *Sports Biomechanics*. 19(4), 510-531.

Adanty K, Clark JM, Post A, Hoshizaki TB, Gilchrist MD. (2019). Comparing two proposed protocols to test the oblique response of cycling helmets to fall impacts. *International Journal of Crashworthiness*. 25(6), 648-663.

Connor TA, Clark JM, Jayamohan J, Stewart M, McGoldrick A, Williams C, Seemungal BM, Smith R, Burek R, Gilchrist MD. (2019). Do equestrian helmets prevent concussion? A retrospective analysis of head injuries and helmet damage from real-world equestrian accidents. *Sports Medicine-Open*. 5(1), 1-8.

Post A, Hoshizaki TB, Karton C, Clark JM, Dawson L, Cournoyer J, Taylor K, Oeur RA, Gilchrist MD, Cusimano MD. (2019). The biomechanics of concussion for ice hockey head impact events. *Computer Methods in Biomechanics and Biomedical Engineering*. 22(6), 631-643.

- Clark JM, Post A, Hoshizaki TB, Gilchrist MD. (2018). Distribution of brain strain in the cerebrum for ice hockey goaltender impacts. *Journal of Biomechanical Engineering*. 140(12), 121007.
- Clark JM, Taylor K, Post A, Hoshizaki TB, Gilchrist MD. (2018). Comparison of ice hockey goaltender helmets for concussion type impacts. *Annals of Biomedical Engineering*. 46(7), 986-1000.
- Post A, Koncan D, Kendall M, Cournoyer J, Clark JM, Kosziwka G, Chen W, de Graus, Hoshizaki TB. (2018). Analysis of speed accuracy using video analysis software. *Sport Engineering*. 21(3), 235-241.
- Clark JM, Hoshizaki TB, Gilchrist MD. (2018). Assessing women's lacrosse head impacts using finite element modelling. *Journal of the Mechanical Behavior of Biomedical Materials*. 80, 20-26.
- Clark JM, Hoshizaki TB, Gilchrist MD. (2017). Protective capacity of an ice hockey goaltender helmet for three events associated with concussion. *Computer Methods in Biomechanics and Biomedical Engineering*. 20(12), 1299-1311.
- Post A, Clark JM, Robertson DGE, Hoshizaki TB, Gilchrist MD. (2017). The effect of acceleration signal processing for head impact numeric simulations. *Sport Engineering*. 20(2), 111-119.
- Clark JM, Post A, Hoshizaki TB, Gilchrist MD. (2016). Protective capacity of ice hockey helmets against different impact events. *Annals of Biomedical Engineering*. 44(12), 3693–3704.
- Clark JM, Hoshizaki TB. (2016). The ability of men's lacrosse helmets to reduce the dynamic impact response for different striking techniques in women's field lacrosse. *The American Journal of Sports Medicine*. 44(4), 1047-1055.
- Nur S, Kendall M, Clark JM, Hoshizaki TB. (2015). A comparison of the capacity of ice hockey goaltender masks for the protection from puck impacts. *Sports Biomechanics*. 14(4), 459-468.
- Refereed Proceedings**
- Clark JM, Adanty K, Post A, Hoshizaki TB, Clissold J, McGoldrick A, Ni Annaidh A, and Gilchrist MD (2018). Reconstruction of real world concussive and non-concussive accidents in equestrian sports. *Proceedings of IRCOBI Conference*, Athens, Greece, September 12-14.
- Clark JM, Connor TA, Williams C, Gilchrist MD. (2017). Damage to real world equestrian helmets sustained from impact against different surfaces. *Proceedings of IRCOBI Conference*, Antwerp, Belgium, September 13-15.
- Clark JM, Post A, Hoshizaki TB, Gilchrist MD. (2016). The association among injury metrics for different events in ice hockey goaltender impacts. *Proceedings of IRCOBI Conference*, Malaga, Spain, September 14-16.
- Clark JM, Post A, Connor TA, Hoshizaki TB, Gilchrist MD. (2016). Effect of impact surface in equestrian falls. *Proceedings of 34th International Conference on Biomechanics in Sports*, Tsukuba, Japan, July 18-22.
- Clark JM, Post A, Hoshizaki TB, Gilchrist MD. (2015). Determining the relationship between linear and rotational acceleration and MPS for different magnitudes of classified brain injury risk in ice hockey. *Proceedings of IRCOBI Conference*, Lyon, France, September 9-11.

Abstracts

Clark JM, Baker WA, Wheeler JR, Wheeler JB. (2022). Rotational head acceleration in rear-end motor vehicle collision and associated concussion risk. *North American Congress on Biomechanics*, Ottawa, ON, Canada, August 21-25.

Clark JM, Wheeler JB. (2022). Development of refined injury corridors for evaluating concussion probability using maximum principal strain and direction sensitivity. *11th European Solid Mechanics Conference*. Galway, Ireland, July 4-8.

Gilchrist MD, Connor TA, Clark JM, McGoldrick A. (2019). Computational analysis of traumatic head injuries resulting from falls and impacts in sports. *AAFS Annual Conference*, Baltimore, MD, USA, February 18-23.

Paiement B, Post A, Koncan D, Kendall M, Cournoyer J, Clark JM, Kosziwka, G, Chen W, de Grau S, Hoshizaki TB. (2018). Analysis of speed accuracy using video analysis software. *The 20th Biennial Meeting of the Canadian Society for Biomechanics*, Halifax, NS, Canada, August 14-17.

Clark JM, Post A, Hoshizaki TB, Gilchrist MD. (2018). The kinematic response characteristics of falls to turf in equestrian sports. *8th World Congress of Biomechanics*, Dublin Ireland, July 8-12.

Adanty K, Clark JM, Post A, Hoshizaki TB, Gilchrist MD. (2018). A comparison between two oblique impact test protocols for cycling helmets. *8th World Congress of Biomechanics*, Dublin Ireland, July 8-12.

Karton C, Post A, Hoshizaki TB, Clark JM, Dawson L, Cournoyer J, Taylor K, Oeur RA, Gilchrist MD, Cusimano MD. (2017). The biomechanics of concussion for ice hockey head impact events. *Mayo Clinic Sports Medicine Ice Hockey Summit III: Action on Concussion*. Rochester, MN, USA, September 28-29.

Dawson LE, Post A, Gilchrist MD, Clark JM, Cournoyer J, Karton C, Oeur A, Taylor K, Hoshizaki TB. (2017). A biomechanical analysis of event specific concussive impacts in American Football. *26th Congress of the International Society of Biomechanics*, Brisbane, Australia, July 23-27.

Clark JM, Post A, Hoshizaki TB, Gilchrist MD. (2015). Protective capacity of ice hockey helmets for different mechanisms of head injury. *25th Congress of the International Society of Biomechanics*, Glasgow, UK, July 12-16.

Clark JM, Hoshizaki TB. (2014). Risk of sustaining a concussion in women's field lacrosse. *The Sport Concussion Conference*, Chicago, IL, July 11-13.

Clark JM, Hoshizaki TB. (2014). Risk of sustaining a concussion in women's field lacrosse. *7th World Congress of Biomechanics*, Boston, MA, USA, July 6-11.

CONFERENCE PRESENTATIONS

Clark JM, Baker WA, Wheeler JR, Wheeler JB. (2022). Rotational head acceleration in rear-end motor vehicle collision and associated concussion risk. *North American Congress on Biomechanics*, Ottawa, ON, Canada, August 21-25.

Clark JM, Wheeler JB. (2022). Development of refined injury corridors for evaluating concussion probability using maximum principal strain and direction sensitivity. *11th European Solid Mechanics Conference*. Galway, Ireland, July 4-8.

Baker WA, Clark JM, Wheeler JR, Wheeler JB. (2021). Validation of rotational head kinematics in IIHS rear-end impact tests determined by video analysis. *49th NHTSA Workshop on Human Subjects for Biomechanical Research*, Virtual, October 26-27.

- Clark JM, Wheeler JB. (2020). The effect of active head restraints (AHRs) on head kinematics in rear impact sled tests. *48th NHTSA Workshop on Human Subjects for Biomechanical Research*, Virtual, October 27-28.
- Gilchrist MD, Connor TA, Clark JM, McGoldrick A. (2019). Computational analysis of traumatic head injuries resulting from falls and impacts in sports. *AAFS Annual Conference*, Baltimore, MD, USA, February 18-23.
- Clark JM, Adanty K, Post A, Hoshizaki TB, Clissold J, McGoldrick A, Ni Annaidh A, and Gilchrist MD. (2018). Reconstruction of real world concussive and non-concussive accidents in equestrian sports. *IRCOBI Conference*, Athens, Greece, September 12-14.
- Paiement B, Post A, Koncan D, Kendall M, Cournoyer J, Clark JM, Kosziwka G, Chen W, de Grau S, Hoshizaki TB. (2018). Analysis of speed accuracy using video analysis software. Sport Engineering. *The 20th Biennial Meeting of the Canadian Society for Biomechanics*, Halifax, NS, Canada, August 14-17.
- Adanty K, Clark JM, Post A, Hoshizaki TB, Gilchrist MD. (2018). A comparison between two oblique impact test protocols for cycling helmets. *8th World Congress of Biomechanics*, Dublin, Ireland, July 8-12.
- Clark JM, Post A, Hoshizaki TB, Gilchrist MD. (2018). The kinematic response characteristics of falls to turf in equestrian sports. *8th World Congress of Biomechanics*, Dublin Ireland, July 8-12.
- Karton C, Post A, Hoshizaki TB, Clark JM, Dawson L, Cournoyer J, Taylor K, Oeur RA, Gilchrist MD, Cusimano MD. (2017). The biomechanics of concussion for ice hockey head impact events. *Mayo Clinic Sports Medicine Ice Hockey Summit III: Action on Concussion*, Rochester, MN, USA, September 28-29.
- Clark JM, Connor TA, Williams C, Gilchrist MD (2017). Damage to Real World Equestrian Helmets Sustained from Impact against Different Surfaces. *IRCOBI Conference*, Antwerp, Belgium, September 13-15.
- Dawson LE, Post A, Gilchrist MD, Clark JM, Cournoyer J, Karton C, Oeur A, Taylor K, Hoshizaki TB. (2017). A biomechanical analysis of event specific concussive impacts in American Football. *26th Congress of the International Society of Biomechanics*, Brisbane, Australia, July 23-27.
- Clark JM, Post A, Hoshizaki TB, Gilchrist MD. (2016). The association among injury metrics for different events in ice hockey goaltender impacts. *IRCOBI Conference*, Malaga, Spain, September 14-16.
- Clark JM, Post A, Connor TA, Hoshizaki TB, Gilchrist MD. (2016). Effect of impact surface in equestrian falls. *34th International Conference on Biomechanics in Sports*, Tsukuba, Japan, July 18-22.
- Clark JM, Post A, Hoshizaki TB, Gilchrist MD. (2015). Determining the relationship between linear and rotational acceleration and MPS for different magnitudes of classified brain injury risk in ice hockey. *IRCOBI Conference*, Lyon, France, September 9-11.
- Clark JM, Post A, Hoshizaki TB, Gilchrist MD. (2015). Protective capacity of ice hockey helmets for different mechanisms of head injury. *25th Congress of the International Society of Biomechanics*, Glasgow, UK, July 12-16.
- Clark JM, Hoshizaki TB. (2014). Risk of sustaining a concussion in women's field lacrosse. *The Sport Concussion Conference*, Chicago, IL, July 11-13.
- Clark JM, Hoshizaki TB. (2014). Risk of sustaining a concussion in women's field lacrosse. *7th World Congress of Biomechanics*, Boston, MA, USA, July 6-11.

ORAL PRESENTATIONS

Clark JM. (2022). Forensic Biomechanics. University of Ottawa - APA 4118: Biomechanical Basis of Injury, Ottawa, ON, Canada, February 14.

Wheeler JB, Weimer Z, Storvik SG, Baker WA, Clark JM, Sreedhar A. (2021, 2022). Accident reconstruction and injury biomechanics in low-speed motor vehicle collisions. *CLE Accredited Seminars*, Arizona, Colorado, and Nevada, USA.

Clark JM. (2018). Head injury and protection in Equestrian Sports. *CAFRE Enniskillen - Equine Health and Safety Day*, Enniskillen, UK, November 15.

Clark JM. (2018). Current R&D in Helmet Design and Testing: Dealing with Rotational Impact. *National Equine Forum*, London, UK, March 8.

AWARDS/PRIZES

- Canadian Interuniversity Sport Academic All-Canadian Honour Roll (2011-2012)
- Canadian Interuniversity Sport Academic All-Canadian Honour Roll (2010-2011)

PROFESSIONAL ACTIVITIES

- 2014 American Academy of Neurology (AAN)
The Sport Concussion Conference – Chicago, Illinois, USA
- 2016 American Society for Testing Materials Meetings (ASTM) International
ASTM Meetings & Symposia: F08 – Sports Equipment, Playing Surfaces, and Facilities – Tampa, Florida, USA
- 2020 – DATE Canadian Standards Association (CSA)
Committee member of the CSA Hockey Working Group 2, subcommittee on ice hockey goaltender helmet standards
- 2022 European Mechanics Society (EUROMECH)
11th European Solid Mechanics Conference – Galway, Ireland
- 2018 International Research Council on Biomechanics of Injury (IRCOBI)
IRCOBI Conference – Athens, Greece
- 2017 IRCOBI Conference – Antwerp, Belgium
- 2016 IRCOBI Conference – Malaga, Spain
- 2015 IRCOBI Conference – Lyon, France
- 2016 International Society of Biomechanics (ISB)
25th Congress of the International Society of Biomechanics – Glasgow, United Kingdom
- 2016 International Society of Biomechanics in Sports (ISBS)
34th International Conference on Biomechanics in Sports – Tsukuba, Japan
- 2018 National Equine Forum (NEF)
26th National Equine Forum – London, United Kingdom
- 2021 Society of Automotive Engineers (SAE)
World Congress Experience Digital Summit – Virtual
- 2020 World Congress Experience Digital Summit – Virtual

- 2022 University of Ottawa (uOttawa), Ottawa, Ontario, Canada
Guest lecturer for APA 4118: Biomechanical Basis of Injury. Lecture topic: “*Forensic Biomechanics*”
- 2021 – 2022 Thesis committee member: Murphy A. (2022). Comparing equestrian helmets with and without rotational technology using an equestrian specific helmet test protocol. MSc. Thesis. University of Ottawa
- 2018 World Council of Biomechanics (WCB)
8th World Congress of Biomechanics – Dublin, Ireland
- 2014 7th World Congress of Biomechanics – Boston, Massachusetts, USA
- 2023 World Reconstruction Exposition (WREX)
World Reconstruction Exposition – Orlando Florida, USA

TRAINING SESSIONS AND WORKSHOPS

National Child Passenger Safety Board Continuing Education Units Webinar: Air Bags 201 (June 22, 2023)

- 1-hour webinar on understanding the physics of motor vehicle crashes and how airbags are designed to reduce injury risk

IPTM: Investigation of Motorcycle Crashes - Level I (Online) (Mar 6 – Apr 9, 2023)

- 40-hour course on the special dynamics involved in pedestrian and bicycle traffic crashes

50th NHTSA Workshop on Human Subjects for Biomechanical Research – Denver, CO, USA (Nov 6, 2022)

- Workshop on current research in the field of injury biomechanics

SAE International’s Accident Reconstruction Digital Summit – Virtual (Mar 29 – 30, 2022)

- Digital Summit on best practices, what information needs to be collected at a crash site, how to prioritize key data, how to interpret results, emerging vehicle technology, and more.

49th NHTSA Workshop on Human Subjects for Biomechanical Research – Virtual (Oct 26 – 27, 2021)

- Workshop on current research in the field of injury biomechanics

IPTM: Pedestrian/Bicycle Crash Investigation – Level I (Online) (Apr 19 – May 23, 2021)

- 40-hour course on the special dynamics involved in pedestrian and bicycle traffic crashes

48th NHTSA Workshop on Human Subjects for Biomechanical Research – Virtual (Oct 27 – 28, 2020)

- Workshop on current research in the field of injury biomechanics

Principles of Dynamic Data Collection – Virtual (Apr 30, 2020, May 6, 2020)

- Two-part webinar on the principles of dynamic data collection.

HEADS Automotive Winter School – Stockholm, Sweden (Nov 23 – 24, 2016)

- Workshop on the application of real-world accident data used to improve safety and design within the automotive industry

IRCOBI 2016 Pre-Conference Workshop: Crash Reconstruction – Malaga, Spain (Sept 13, 2016)

- Workshop on different techniques used in crash reconstructions

HEADS Workshop on Neuroanatomy – Leuven, Belgium (Apr 25 – 29, 2016)

- Workshop on neuroanatomy
- Workshop on medical imaging
- Workshop on intellectual property and innovation

International Winter School: New Challenges in the Physics of the Brain – Les Houches, France (Feb 14-19, 2016)

- Workshop on the physics of brain from cells to organs (completed as part of Doctorate studies under the Marie-Curie Innovations Training Network, HEADS (Head protection: a European training network for Advanced Designs in Safety))

IRCOBI-NOCSAE-PDB-Snell Workshop – Lyon, France (Sept 8, 2015)

- Angular Head Motions: Their importance and measurement of brain injury risk

