

## CURRICULUM VITAE

DINESH ARUN KUMBHARE, MD, PhD, FRCP (C), FAAPMR  
Toronto Rehabilitation Institute  
550 University Avenue,  
Toronto, Ontario M5G 2A2

### PERSONAL DATA:

Date of Birth: April 30, 1963

Marital Status: Married

Citizenship: Canadian

### 1. EDUCATION

#### Degrees

- 2015 - 2017 PhD, Biomedical Engineering, Institute of Biomaterials and Biomedical Engineering, University of Toronto: *"Ultrasound Characterization of Upper Fibers of Trapezius Muscle in Healthy and Myofascial Neck Pain."*  
Degree status: Completed  
Supervisor: Dr. Geoff Fernie
- 1990 – 1995 Master of Health Sciences, Design Measurement and Evaluation - Masters, Clinical Epidemiology, McMaster University: *A Clinical Trial Using a Factorial Design to Determine the Effectiveness of Anti-inflammatory Medication and a Physiotherapy Program in the Functional Recovery of Acute Ankle Sprains in Athletes."*  
Degree Status: Completed  
Supervisors: Dr. Edward Gibson, Dr. Geoff Norman, Dr. L Hart
- 1983 – 1987 Doctorate, Medical Doctor - M.D., Medicine, Dalhousie University  
Degree Status: Completed  
Supervisors: Dr. T Murray, Dean

#### Postgraduate, Research and Specialty Training

- 1993 Faculty of Health Sciences, McMaster University, Assistant Professor
- 1992-1994 Faculty of Medicine, McMaster University, Hamilton, Ontario, Canada  
Clinical Scholarship under Dr. A. McComas and Dr. S. Banerjee
- 1991-1992 Faculty of Medicine, McMaster University, Chief Resident in Physical Medicine and Rehabilitation

- 1988-1992 Faculty of Medicine, McMaster University Residency in Physical Medicine and Rehabilitation
- 1987-1988 Faculty of Medicine, Dalhousie University Halifax, Nova Scotia, Canada Internship, “Rotating”

### **Qualifications, Certifications and Licenses**

- 2013 Re-certification with the American Board of Physical Medicine and Rehabilitation
- 2003 Re-certification with the American Board of Physical Medicine and Rehabilitation
- 1994 Diplomat of the American Board of Physical Medicine and Rehabilitation
- 1992 Fellow of Royal College of Physicians and Surgeons of Canada on Physical Medicine and Rehabilitation, successfully complete the examination and admitted as a Fellow
- 1988 LMCC licentiate

## **2. EMPLOYMENT**

### **Current Appointments**

- 2022 - present Professor, Division of Physiatry, Department of Medicine, University of Toronto, Toronto, Ontario, Canada
- 2021 – present Director, Schroeder Pain Assessment Rehabilitation Research Center (SPARC)
- 2021 Apr - present Scientist, KITE Research Institute, Toronto Rehabilitation Institute, Toronto, Ontario, Canada
- 2020 - present Adjunct Faculty, Department of Mathematics and Actuarial Sciences, Western University, London, Ontario, Canada
- 2014 - 2021 Apr Affiliate Scientist, KITE, Toronto Rehabilitation Institute, Toronto, Ontario, Canada
- 2023 Apr - present Chair, Pain Assessment and Rehabilitation, University of Toronto and KITE Research Institute, Toronto, Ontario, Canada
- 2018 Jun - present Clinician Scientist, Medicine, University of Toronto, Toronto, Ontario, Canada
- 2018 Jan - present Adjunct Faculty, Institute of Biomedical Engineering, University of Toronto, Toronto, Ontario, Canada
- 2018 Jan - present Adjunct Faculty, Institute of Health Policy, Management and Evaluation, University of Toronto, Toronto, Ontario, Canada
- 2015 Jan - present Adjunct Faculty, Physical Education and Health, Kinesiology & Physical Education, University of Toronto, Toronto, Ontario, Canada

2015 – present	Lead Assessor, Physical Medicine and Rehabilitation, College of Physicians and Surgeons of Ontario
2015 – present	Pain Special Interest Group Lead, Canadian Association of Physical Medicine and Rehabilitation
2013 – present	Peer Assessor, Physical Medicine and Rehabilitation, College of Physicians and Surgeons of Ontario
2007 - present	Adjunct Faculty, Department of Engineering, Biomedical Engineering, McMaster University, Hamilton, Ontario, Canada
2005 - present	Adjunct Faculty, Imaging Research Center, McMaster University, Hamilton, Ontario, Canada
2001 – present	Associate Professor. Faculty of Health Sciences, Department of Medicine. Mc Master University

### Previous Appointments

#### HOSPITAL

2010 - 2012	Medical Director, Chronic Pain Management Unit, Hamilton Health Sciences Corporation, Hamilton, Ontario, Canada
2010	MRP Spinal Cord Unit, Regional Rehabilitation Center, Hamilton Health Sciences Corporation, Hamilton, Ontario, Canada
2006 - 2007	MRP Spinal Cord Unit, Chedoke Hospital, Hamilton Health Sciences Corporation, Hamilton, Ontario, Canada
1995 - 2010	Head of Service, Rehabilitation Medicine, St. Joseph's Hospital, Hamilton, Ontario, Canada
1995 - 2010	Medical Director, Center of Acute Injury Rehabilitation, St. Joseph's Hospital, Hamilton, Ontario, Canada
1994 – 2013	Joint appointments, St. Joseph's Hospital and Hamilton Health Sciences Corporation, Hamilton, Ontario, Canada
1994 - 2000	Team Physician, Hamilton Tiger Cats Football Club
1992	Team Physician, Hamilton Skyhawks Basketball team
1992 - 1993	Hamilton Spectator Indoor Games 91st Highlanders Athletic Association Sports Physician
1992 – 1993	Faculty of Medicine, McMaster University Clinical Scholarship with Dr. A. McComas and Dr. S. Banerjee
1992	Medical Council of Canada, Examiner for OSCE type part II examination
1988 - 1992	Faculty of Medicine, McMaster University Residency in Physical Medicine and Rehabilitation
1987 – 1988	Faculty of Medicine, Dalhousie University Internship, rotating
1986 – 1987	Faculty of Medicine, Dalhousie University Clinical Clerkship

**UNIVERSITY - RANK**

2022 - present	Professor, Division of Physiatry, Department of Medicine, University of Toronto, Toronto, Ontario, Canada
2014 - 2022	Associate Professor, Division of Physiatry, Department of Medicine, University of Toronto, Toronto, Ontario, Canada
2001 - 2014	Associate Professor, Department of Medicine with appointments in Physical Medicine and Rehabilitation and Rheumatology, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada
1994 - 2000	Assistant Professor, Department of Medicine, Faculty of Health Sciences, McMaster University, Hamilton, Ontario, Canada

**OTHER**

1994 - 2000	Team Physician, Hamilton Tiger Cats Football Club
1993	Team Physician, Hamilton Skyhawks Basketball team
1992 - 1993	Sports Physician, Hamilton Spectator Indoor Games 91st Highlanders Athletic Association

**3. PROFESSIONAL AFFILIATIONS AND ACTIVITIES****Professional Associations**

2013 Jul 1 - present	<b>Lead SIG: Pain</b> , Canadian Association of Physical Medicine and Rehabilitation
2013 - present	<b>Member</b> , Academic Association of Physiatrists
2004 - present	<b>Member</b> , American Association of Physical Medicine and Rehabilitation

**Administrative Activities****INTERNATIONAL**Other Organizations

2020 - present **Executive**, RCTrack, Rome, Italy.

Association of Academic Physiatrists

2018 - present **Member**, Research Committee, United States.

Cochrane Rehabilitation

2021 - present **Member**, Methodology Working Area, Rome, Italy  
 2020 - present **Executive**, Executive Committee, Rome, Italy

International Society of Physical and Rehabilitation Medicine

- 2019 - present      **Member**, Clinical Sciences & Research Committee  
 2019 - present      **Secretary**, Pain Special Interest Group

NSERC

- 2020 - present      **Reviewer**, Research Grants and Scholarships

World Health Organization

- 2019 - 2021      **Member**, Development Group for Low Back Pain, Genève (fr), Switzerland.

## PROVINCIAL / REGIONAL

McMaster University

- 2011 - present      **Rater**, McMaster Online Rating of Evidence (MORE), Faculty of Medicine, Dept of Medicine, Physical Medicine and Rehabilitation, Multilevel Education, Hamilton, Ontario, Canada.

## LOCAL

McMaster University

- 2013                  **Co-Chair**, 7th Annual McMaster Pain Program, October 26, 2013.  
 2013                  **Member**, Planning Committee, 7th Annual McMaster Pain Program, October 26, 2013.  
 2012                  **Moderator**, 6th Annual McMaster Pain Program, September 15, 2012.  
 2012                  **Member**, Planning Committee, 6th Annual McMaster Pain Program, September 15, 2012.

University of Toronto

- 2018 - present      **Member**, Research Committee, Faculty of Medicine, Dept of Medicine, Physical Medicine and Rehabilitation, Faculty Development, Canada.  
 2015 - 2021      **Member**, Residency Program Committee, Faculty of Medicine, Dept of Medicine, Physical Medicine and Rehabilitation, Postgraduate MD  
 2015 - 2021      **Lead**, Journal Club, Faculty of Medicine, Dept of Medicine, Physical Medicine and Rehabilitation, Postgraduate MD  
 2015 - present      **Coordinator**, Faculty Research Day, Faculty of Medicine, Dept of Medicine, Physical Medicine and Rehabilitation, Postgraduate MD

## Other Research and Professional Activities

### PROFESSIONAL

2019 – 2021 WHO Low Back Pain Group. World Health Organization, Member.

### JOURNAL Reviewer and Editorial Board Memberships:

2004 - present Spine: Member of Associate Editorial Board for “Spine” (2011).  
 2013 - present AAPMR Annual Meeting Abstract reviewer  
 2016 - present American Journal of Physical Medicine and Rehabilitation, Section Editor,  
 Physiatry Reviews for Evidence in Practice (PREP) Second Order Peer  
 Reviews of Clinically Relevant Articles for the Physiatrist  
 2018 - present American Journal of Physical Medicine and Rehabilitation, Section Editor,  
 Residents and Fellows Section  
 2020 - present American Journal of Physical Medicine and Rehabilitation, Section Editor,  
 Research Methods Section  
 2009 - 2015 Therapeutic Advances in Musculoskeletal Diseases,  
 associate member editorial board

## 4. RESEARCH FUNDING

### FUNDED GRANTS

2023 Sept – 2025 Oct	<b>Supervisor.</b> An Integrated and adaptive examining central and peripheral mechanisms of chronic pain in knee osteoarthritis patients. Mathematics of Information Technology and Complex Systems (MITACS). Applicant: Ethan Danielli; Co-Supervisor: Popovic, Milos. 120,000 CAD
2022 Sept – 2027 Oct	<b>Co-supervisor.</b> A Novel System to Quantify the Risk of Exposure to Infection in Healthcare Settings Using Wearables. Mathematics of Information Technology and Complex Systems (MITACS. Applicant: Roohi Koorosh; Supervisor: Roshan Fekr, Atena. 240,000 CAD.
2023 Sept – 2024 Sept	<b>Supervisor.</b> Exploring identified pain phenotypes and predictors: Advancing multidisciplinary treatment personalization through comprehensive exploration of genetic markers, neuroimaging patterns, and psychosocial variables CIHR Canada Graduate Scholarships – Master’s program. Principal Applicant: Steen, Jeremy. 17,500 CAD

2023 June – 2024 July	<b>Co-investigator.</b> Quantitative Measurements of Chronic Pain. McMaster Institute for Research on Aging (MIRA) & Michael G.DeGroot Institute for Pain Research and Care (IPRC). Collaborator(s): PI: Howlader, M.; Co-PI(s): Adronov, A; Singh, G; Co-I(s): Shanthanna, H. 60,000 CAD
2021 Apr – 2027 Mar	Natural Sciences and Engineering Research Council of Canada (NSERC). Discovery Grant 2021 Apr – 2027 March 160,000 CAD Assessment of the Influence of Central Sensitization on the Structure and Function of the Spinal Cord and its supplied Muscles. <b>Principal Investigator</b>
2022 Apr – 2027 Mar	<b>Co-Principal Investigator.</b> Development of Objective Biomarker for Concussion and Chronic Pain using fMRI. SOPHIE (Southern Ontario Pharmaceutical and Health Innovation Ecosystem). Collaborator(s): Noseworthy, M. 122,728 CAD
2022 Jun – 2024 Jun	<b>Co-Applicant.</b> Systemic inflammatory biomarkers and brain functional connectivity: Identifying a neuroinflammatory signature in patients with idiopathic chronic neck pain. Canadian Chiropractic Research Foundation (CCRF). CCRF's National Research Fund. Principal Investigator: Felipe Duarte Colaborators: Daniel West, Michael Noseworthy. 25,000 CAD
2022 Jan – 2027 Jan	<b>Principal Investigator.</b> Investigating a Electromyography Based Electronic Textile for Diagnosis, Monitoring and Treatment of Chronic Pain. Mathematics of Information Technology and Complex Systems (MITACS). Accelerate. 90,000 CAD
2022 Feb – 2023 Feb	<b>Co-Applicant.</b> Are exercise snacks a feasible and effective lifestyle strategy to reduce sedentary time and cardiometabolic disease risk in patients with chronic pain? University of Toronto, KPE Faculty Research Grant. Principal Applicant: Gillen, J.; Co-Applicant: West, D. 9,500 CAD
2022 Oct – 2027 Sept	<b>Co-Investigator.</b> Precision cardiovascular profiling and risk prediction in survivors of breast cancers (PROGRESS-BC): A prospective cohort study. Canadian Institutes of Health Research (CIHR). Project Grant Scheme. Principal Investigator: Adams, S.C; Co-PIs: Abdel Qadir H, Amir E, Thavendiranathan P; Co-Is: Andrezza A, Cifra B, Fish J, Gupta A, Hodgson D, <b>Kumbhare D</b> , Lega L; Mertens L, Moayed Y, Nathan P, Ross H, Santa Mina D, West D; Trainee Co-Is: Brahmhatt P, Gustafson D, Lee L, Rivera-Theurel F, Sicova M; Collaborators: Edgell H, Fan S, Gillen J, Oh P, Sabiston C, Trinh L; Patient Partners: Palmer H & Stolfi D. \$1,200,000 CAD

2021	<b>Supervisor.</b> Stan Gasner Graduate Scholarship in Healthcare Engineering. Faculty of Applied Science and Engineering, University of Toronto. Student: Fatemeh Shomal Zadeh. Funding Amount: \$3,719.21
2021 Sep – 2022 Sep	<b>Supervisor.</b> Investigating the Effect of Sensory Input on Muscle Function. NSERC. Canada Graduate Scholarships – Master’s program. Principal Applicant: Nesovic, Karlo. 17,500 CAD
2021 Mar – 2023 Mar	<b>Principal Investigator.</b> From structure to perception: Defining the structural and functional features of Central Sensitization. New Frontiers in Research Fund. Exploration 2020. Collaborator(s): Noseworthy M, West D, Doyle T, Furlan A, Flannery J, Koh R, Britz-Mckibbin P. 243,750 CAD.
2020 Dec – 2022 Dec	<b>Co-Principal Investigator.</b> The Effect of Cervical Spinal Manipulation on Brain Functional Connectivity Using Magnetic Resonance Neuroimaging in Patients with Chronic Neck Pain. Canadian Chiropractic Research Foundation (CCRF). Co-applicant: Felipe Duarte; Co-investigator: Budgell, B., West, D., Assimakopoulos, D., Noseworthy, M., Mior, S. 63,000 CAD.
2020 Nov – 2024 Nov	<b>Co-Principal Investigator.</b> Buddy4Rehab: An Automated Tele-rehabilitation Platform for Patients with Arthritis and Musculoskeletal Problems. Arthritis Society. Innovation Grant. Collaborator(s): Co-PI: Roshan Fekr, A.; Zariffa, J.; Fernie, G. 100,000 CAD
2020 Sept – 2023 Dec	<b>Principal Investigator.</b> Development of a Canadian Return-to-Work Clinical Decision Rule for Chronic Pain Patients. WSIB. Grants Program. Co-investigator: Gignac, M. 140,000 CAD.
2020 Jun – 2022 Jun	<b>Co-Principal Investigator.</b> Advanced Imaging Techniques in Chronic Musculoskeletal Disorders, Separating them from Concussion Related Changes of the brain using fMRI. Juravinski Research Institute Grant, McMaster University. Co-investigator: Dobranowski, J., Noseworthy, M. 180,000 CAD
2020 Dec – 2022 Dec	<b>Principal Investigator.</b> Identification of high risk, non-responder phenotypes among TKA candidates using clinical, serological and pain sensitization markers: A novel diagnostic approach. MSH-UHN Academic Medical Organization. AHSC AFP Innovation Fund. 111,445 CAD
2019 Jul – 2020 Dec	<b>Co-Principal Investigator.</b> Skeletal Muscle Fat Infiltration of the Limb Muscles in Idiopathic Pulmonary Fibrosis. Ontario Thoracic Society. Co-P: Rosenberg, D. 49,912.2 CAD



2018 - 2022	<b>Co-Investigator.</b> Development of Novel Magnetic Resonance Imaging (MRI) Algorithms for the Assessment of Mild Traumatic Brain Injury (mTBI). NSERC I2I. Co-investigator: Noseworthy, M. 123,000 CAD
2014 Jun – 2015 Jun	<b>Principal Investigator.</b> Development of Chronic Pain Program at TRI. MSH-UHN Academic Medical Organization. AFP Innovation Fund, Department of Medicine. Collaborator(s): <b>Kumbhare</b> , D., Flannery, J., Furlan, A. 53,300 CAD
2012 Jun – 2013 May	<b>Collaborator.</b> Development of a Novel Immunological Technique for Biomarkers Quantitation: Phase 3. National Research Council Canada (NRC), Industrial Research Assistance Program (IRAP). Collaborators: STI Research Inc: Parkinson, W.; Activation Laboratories (Industry Sponsor): Hoffman, E., Hoffman, M. 288,990 CAD (NRC amount \$184,030)
2010 Apr – 2012 Mar	<b>Collaborator.</b> Development of a Novel Immunological Technique for Biomarkers Quantitation: Phase 2. National Research Council Canada (NRC) (Ottawa, ON). Industrial Research Assistance Program (IRAP). Collaborator(s): STI Research Inc: <b>Kumbhare</b> , D., Parkinson, W. Activation Laboratories (Industry Sponsor): Eric Hoffman. 733,205 CAD (NRC amount \$439,923; Activation Laboratories Contribution Amount \$293,282).
2009 Feb – 2010 Feb	<b>Principal Investigator.</b> Quantification of Whiplash Injury Using a Novel RF Coil and Functional MRI Fractal Dimension Mapping. Ontario Research Commercialization Program. POP Grant. 22,000 CAD
2008 Jan – 2009 Dec	<b>Collaborator.</b> Quantification of whiplash injury using a novel MRI RF coil and functional muscle MRI fractal dimension mapping. Canadian Institutes of Health Research (CIHR). Collaborator(s): Noseworthy MD, <b>Kumbhare D</b> , Harish S. 143,000 CAD
2008 Sep – 2009 Aug	<b>Collaborator.</b> Further Development of a Biochemical Approach to Measuring Surgical Trauma to Musculoskeletal Tissues. Hamilton Surgical Associates. Research Grant. Collaborator(s): Anthony Adili, R Brett Dunlop, <b>Kumbhare</b> , D., Richards, C., Rosenfeld, J., Parkinson, W. 25,800 CAD
2008 Apr – 2009 Mar	<b>Collaborator.</b> Development of a Novel Immunological Technique for Biomarkers Quantitation. National Research Council Canada (NRC) (Ottawa, ON). Industrial Research Assistance Program (IRAP). Collaborator(s): STI Research Inc: <b>Kumbhare</b> , D., Parkinson, W.

	Activation Laboratories (Industry Sponsor): Eric Hoffman. 304,543 CAD (NRC amount \$130,305; Activation Laboratories Contribution Amount \$174,238).
2006 Mar – 2007 Feb	<b>Collaborator.</b> Validity of Serum Creatine Kinase and Interleukin-6 Concentrations as Measures of Surgically Produced Muscle Injury. Hamilton Surgical Associates. Research Grant. Collaborator(s): Brett Dunlop, R., <b>Kumbhare</b> , D., Missiuna, P., Parkinson, W., Richards, C. 12,500 CAD
2005 Sep – 2006 Aug	<b>Collaborator.</b> Biochemical measurement of injury following total knee replacement. Hamilton Surgical Associates. Research Grant. Collaborator(s): Adili, A., DeBeere, J., Denkers, M., <b>Kumbhare</b> , D., Missiuna, P., Parkinson, W. 17,000 CAD
2003 Jan – 2003 Aug	<b>Collaborator.</b> Pilot Study to Examine Physical and Psychological Factors in Non-Ulcer Upper Abdominal Pain. Ministry of Health of Ontario. Collaborator(s): <b>Kumbhare</b> , D., Annis, R., Tougas, G., Parkinson, W. 25,475 CAD
2002 Sept – May 2003	<b>Principal Investigator.</b> A Double Blind Randomized Controlled Study of Tolerance, Safety, and Preliminary Clinical Effects of HP184 For Spinal Cord Injury. Aventis Pharmaceuticals. 35,000 per patient (targeted 10 patients)
2000 Jan – 2000 Spring	<b>Principal Investigator.</b> Hamilton Site for a Double Blind Placebo Controlled Trial of Tramadol plus Acetaminophen for Chronic Low Back Pain. Janssen-Ortho Pharmaceuticals. 40,000
2000 Jan	<b>Principal Investigator.</b> Hamilton Site for a Double Blind Placebo Controlled Trial of Tramadol plus Acetaminophen for Chronic Low Back Pain. Janssen-Ortho Inc. 40,000
1999 Oct – 2000 May	<b>Collaborator.</b> Evaluation of the Quebec Task Force Guidelines for Whiplash Associated Disorders. Hamilton Hospital Assessment Centre. Collaborator(s): <b>Kumbhare</b> , D., Parkinson, W., Adachi, J. 14,000 CAD
1999 Dec – 2000 Apr	Principal Investigator. Hamilton Site for a Double Blind RCT of Celecoxib vs. Naproxen in Ankle Sprains. Searle Pharmaceuticals. 10,000

## 5. STUDENT/POSTDOCTORAL SUPERVISION

### Post-doctorate [n=8]

Name: Position: Year: Awards/Funding	Ethan Danielli Postdoctoral Research Fellow, KITE, University Health Network Start date: Nov 2022 – present (expected end date: Nov 2026). Primary supervisor Mitacs Elevate grant. An Integrated and adaptive study examining central and peripheral mechanisms of chronic pain in knee osteoarthritis patients. 120,000 CAD
Name: Position: Year: Awards/Funding	Ryan Koh Postdoctoral Research Fellow, KITE, University Health Network Start date: Jan 2020 – present (expected end date: Feb 2024), Primary supervisor
Name: Position: Year: Awards/Funding	Daniel West Affiliate Scientist, KITE, University Health Network Start date: Jan 2020 - present
Name: Position: Year: Awards/Funding	Samah Hassan Postdoctoral Research Fellow, KITE, University Health Network Start date: July 2020 – June 2022. Primary supervisor
Name: Position: Year: Awards/Funding	Liza Grosman-Rimon Postdoctoral Research Fellow, KITE, University Health Network September 2014-2017. Primary supervisor
Name: Position: Year: Awards/Funding	Tanya Zaraiskaya Postdoctoral Research Fellow, KITE, University Health Network September 2004 – January 2006. Primary supervisor
Name: Position: Year: Awards/Funding	Atefeh Noori Research Associate, KITE, University Health Network Jan 2020 – 2021. Primary supervisor
Name: Position: Year: Awards/Funding	Felipe Duarte Postdoctoral Research Fellow, KITE, University Health Network Jan 2019 – Jan 2023. Primary supervisor

### Doctoral [n=7]

Name: Academic Unit: Degree: Awards/Funding	Mahnaz Tajik Medical Sciences Faculty, McMaster PhD. June 2023-present. Co-supervisor
Name: Academic Unit: Degree: Awards/Funding:	Fatemeh Shomal Zadeh Institute of Biomedical and Biomaterial Engineering PhD. Sept 2020–present. Co-supervisor Stan Gasner Graduate Scholarship in Healthcare Engineering. Faculty of Applied Science and Engineering, University of Toronto. Funding Amount: \$3,719.21
Name: Academic Unit: Degree: Awards/Funding	Azadeh Aghamohammadi Sereshki Institute of Biomedical Engineering PhD. Sept 2020-August 2022. Primary supervisor
Name: Academic Unit: Degree: Awards/Funding	Mikaela Stiver University of Toronto PhD. 2017-2020. Co-supervisor with Dr. Anne Agur. Vanier Graduate Scholarship \$40,000
Name: Academic Unit: Degree: Awards/Funding	Andrew Davis Medical Physics, McMaster University PhD. January 2010 – 2015. Co-supervisor with Dr. M.Noseworthy
Name: Academic Unit: Degree: Awards/Funding	Alyaa Elzibak Medical Physics, McMaster University PhD. January 2009 – 2014. Co-supervisor with Dr. M.Noseworthy
Name: Academic Unit: Degree: Awards/Funding	Gavin Jones Biomedical Engineering, McMaster University PhD. September 2008 - 2012. Co-supervisor with Dr. M.Noseworthy

### Master's Thesis [n=8]

Name: Academic Unit: Degree: Awards/Funding	Joana Dilipkumar Institute of Biomedical Engineering, University of Toronto MAsc. Sept 2023 – Sept 2025. Principal Supervisor
Name: Academic Unit: Degree: Awards/Funding	David Koivisto Institute of Biomedical Engineering, University of Toronto MAsc. Sept 2023 – Sept 2025. Principal Supervisor
Name: Academic Unit:	Jeremy Steen Institute of Health Policy, Management and Evaluation, University of

Degree: Awards/Funding:	Toronto MAsc. Sept 2023 – Sept 2025. Principal Supervisor CGS-M CIHR award \$17,500 CAD
Name: Academic Unit: Degree: Awards/Funding:	Josh Downer Faculty of Kinesiology & Physical Education MAsc. Sept 2023 – Sept 2025. Co-Supervisor
Name: Academic Unit: Degree: Awards/Funding:	Karlo Nesovic Institute of Biomedical and Biomaterial Engineering, University of Toronto MAsc. Sept 2020 – Sept 2022. Principal supervisor NSERC, Graduate scholarships, Masters Program \$17,500 CAD
Name: Academic Unit: Degree: Awards/Funding:	Valerie Evans Institute of Biomedical and Biomaterial Engineering, University of Toronto MAsc. Sept 2018 to June 2020. Principal supervisor
Name: Academic Unit: Degree: Awards/Funding:	Margaret Kirkwood University of Guelph MAsc. Sept 2016 to 2019. Co-Principal supervisor
Name: Academic Unit: Degree: Awards/Funding:	Sonya Bells Medical Physics, McMaster University MSc. Sept 2003 – Mar 2006. Co-Primary supervisor

### Undergraduate students [n=2]

Name: Academic Unit: Year:	Liuyue (Louise) Xie Biomedical Engineering Minor Sept – December 2018 – 4 <sup>th</sup> year student as part of BME499Y1 (Applied Research in Biomedical Engineering)
Name: Academic Unit: Year:	Romaissa Allalou Biomedical Engineering January – June 2019 – 4 <sup>th</sup> year student as part of BME499Y1 (Applied Research in Biomedical Engineering)

### Undergraduate Education

Clinical Experience [n=26]

<b>Name:</b> <b>Academic Unit:</b>	Lauren Wilcox BKin. University of Toronto
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<b>Year:</b>	Sept 2023 – March 2024
<b>Name:</b>	Trishawna Fongwoo
<b>Academic Unit:</b>	BKin. University of Toronto
<b>Year:</b>	Sept 2023 – March 2024
<b>Name:</b>	Chung Yan Yiu
<b>Academic Unit:</b>	BKin. University of Toronto
<b>Year:</b>	Sept 2023 – March 2024
<b>Name:</b>	Sum Yuet Chong
<b>Academic Unit:</b>	BKin. University of Toronto
<b>Year:</b>	Sept 2023 – March 2024
<b>Name:</b>	Julianna Manserra
<b>Academic Unit:</b>	BKin, University of Toronto
<b>Year:</b>	Sept 2022- – June 2023
<b>Name:</b>	Samantha Giorgi
<b>Academic Unit:</b>	BKin, University of Toronto
<b>Year:</b>	Sept 2022- – June 2023
<b>Name:</b>	Lucy (Yi Duo) Wang
<b>Academic Unit:</b>	BKin, University of Toronto
<b>Year:</b>	Sept 2022- – June 2023
<b>Name:</b>	Clara Rivaya Salvadores
<b>Academic Unit:</b>	BKin, University of Toronto
<b>Year:</b>	Sept 2022- – June 2023
<b>Name:</b>	Charles Adeyinka
<b>Academic Unit:</b>	BKin, University of Toronto
<b>Year:</b>	Sept 2021- – June 2022
<b>Name:</b>	Fukushi Minori
<b>Academic Unit:</b>	BKin, University of Toronto
<b>Year:</b>	Sept 2021- – June 2022
<b>Name:</b>	Eric Antonen
<b>Academic Unit:</b>	BKin, University of Toronto
<b>Year:</b>	Sept 2021 – June 2022
<b>Name:</b>	Jamie Bell
<b>Academic Unit:</b>	BKin, University of Toronto
<b>Year:</b>	Sept 2021 – June 2022
<b>Name:</b>	Richard Chen
<b>Academic Unit:</b>	BKin, University of Toronto
<b>Year:</b>	Sept 2020 – June 2021
<b>Name:</b>	Krishman Sivaloganathan
<b>Academic Unit:</b>	BKin, University of Toronto
<b>Year:</b>	Sept 2020 – June 2021
<b>Name:</b>	Golnaz Ghazinour
<b>Academic Unit:</b>	BKin, University of Toronto
<b>Year:</b>	Sept 2020 – June 2021
<b>Name:</b>	Evelyn Shapiro
<b>Academic Unit:</b>	BKin, University of Toronto
<b>Year:</b>	Sept 2020 – June 2021

<b>Name:</b> <b>Academic Unit:</b> <b>Year:</b>	Alison Lines BKin, University of Toronto Sept 2020 – June 2021
<b>Name:</b> <b>Academic Unit:</b> <b>Year:</b>	Kosana Tharmaratnam BKin, University of Toronto Sept 2018 – June 2019
<b>Name:</b> <b>Academic Unit:</b> <b>Year:</b>	Vanessa Silano BKin, University of Toronto Sept 2018 – June 2019
<b>Name:</b> <b>Academic Unit:</b> <b>Year:</b>	Alice Chen BKin, University of Toronto Sept 2018 – June 2019
<b>Name:</b> <b>Academic Unit:</b> <b>Year:</b>	Natalie Ford BKin, University of Toronto March 2018 – Dec 2018
<b>Name:</b> <b>Academic Unit:</b> <b>Year:</b>	Victor Wu BKin, University of Toronto March 2018 – Dec 2018
<b>Name:</b> <b>Academic Unit:</b> <b>Year:</b>	Jinhym Kim BKin, University of Toronto March 2018 – Dec 2018
<b>Name:</b> <b>Academic Unit:</b> <b>Year:</b>	Alyssa Iacroy BKin, University of Toronto March 2018 – Dec 2018
<b>Name:</b> <b>Academic Unit:</b> <b>Year:</b>	Nathan Yau BKin, University of Toronto Sept 2017 – June 2018
<b>Name:</b> <b>Academic Unit:</b> <b>Year:</b>	Hayley Alison Neale BKin, University of Toronto Sept 2017 – June 2018

### Graduate Student Thesis - Committee Member [n=13]

<b>Name:</b> <b>Academic Unit:</b> <b>Degree:</b>	Gansen Deng Western University PhD Sept 2019 - Present
<b>Name:</b> <b>Academic Unit:</b> <b>Degree:</b>	Alireza Etefagh Institute of Biomedical Engineering, University of Toronto PhD. Sept 2023 - Present
<b>Name:</b> <b>Academic Unit:</b> <b>Degree:</b>	Erik Jacques Institute of Biomedical Engineering, University of Toronto PhD. Sept 20219 - Present

Name: Academic Unit: Degree:	Joshua McGillivray Biomedical Engineering, McMaster University MAsc. February 2021-present
Name: Academic Unit: Degree:	Adriano Nella Institute of Medical Science, University of Toronto MSc. 2021 – 2023
Name: Academic Unit: Degree:	Thaejaesh Sooriyakumaran Biomedical Engineering, McMaster University MAsc. February 2021
Name: Academic Unit: Degree:	Mason Kadem Biomedical Engineering, McMaster University MSc. 2023
Name: Academic Unit: Degree:	Anca Maglaviceanu Laboratory Medicine & Pathobiology, University of Toronto MSc. Sept 2021-April 2023
Name: Academic Unit: Degree:	Barzegar Khanghah Institute of Biomedical Engineering, University of Toronto MSc. 2023
Name: Academic Unit: Degree:	Alejandro Amador Institute of Biomedical Engineering, University of Toronto MSc. April 2023
Name: Academic Unit: Degree:	Goran Perkić Kinesiology and Physical Education, Exercise Science, University of Toronto MSc. September 2019 – present
Name: Academic Unit: Degree:	Sidney Abou Sawan Kinesiology and Physical Education, Exercise Science, University of Toronto PhD. September 2018 – 2021
Name: Academic Unit: Degree:	Michael Mazzulla Kinesiology and Physical Education, Exercise Science, University of Toronto September 2018 – 2021

### Graduate Examinations [n=24]



Name: Academic Unit: Thesis Title: Role:	Mikaela Stiver (PhD). February 28, 2022. Rehabilitation Sciences Institute, University of Toronto. Three-dimensional Architectural and Structural Properties of the Human Trapezius Muscle: Missing links in Musculoskeletal Research. Co-Supervisor
Name: Academic Unit: Thesis Title: Role:	Martin Rotenberg (MSc). September 22, 2021. Clinical Epidemiology & Health Care Research. Institute of Health Policy, Management and Evaluation, University of Toronto. The role of geospatial factors and distance on timely physician follow-up after a first hospitalization discharge with a diagnosis of a schizophrenia spectrum disorder: A retrospective population-based cohort study. Examiner
Name: Academic Unit: Thesis Title: Role:	Sidney Abou Sawan (PhD Departmental Defence). June 14, 2021. Faculty of Kinesiology & Physical Education, University of Toronto. Mechanisms Regulating Resistance Training Mediated Hypertrophy in Human Skeletal Muscle” Examiner, Committee Member
Name: Academic Unit: Thesis Title: Role:	Calvin Zhu (MAsc). July 8, 2020. Biomedical Engineering. McMaster University A Comprehensive Anatomical and Structural Characterization of the Human Trapezius Muscle: Implications for Myofascial Pain Syndrome Member.
Name: Academic Unit: Thesis Title: Role:	Thurarshen Jeyalingam (MSc Oral Defense). June 24, 2020. Institute of Health Policy, Management & Evaluation, University of Toronto. Exploring supervisors’ decision about procedural entrustment in simulation-based and workplace-based settings. Exam Chair
Name: Academic Unit: Thesis Title: Role:	Sidney Abou Sawan (PhD Proposal Defense). December 18 <sup>th</sup> , 2018. Faculty of Kinesiology & Physical Education, Department of Exercise Sciences, University of Toronto. The Effect of Amino Acids and Resistance Exercise on the Mechanisms of Muscle Adaptation with Training Examiner: Committee Member
Name: Academic Unit: Thesis Title:	Michael Mazzulla (PhD Proposal Defense). Faculty of Kinesiology & Physical Education. Department of Exercise Sciences, University of Toronto. The Development of Oral Amino Acid Traced Models to Study Protein Turnover in Humans.

Role:	Committee Member
Name: Academic Unit: Thesis Title: Role:	Paul Angaran (MSc Oral Defense). December 18 <sup>th</sup> , 2018. Institute of Health Policy, Management & Evaluation, University of Toronto. Mental Illness Diagnosis After Intensive Care. Thesis Supervisor: Dr. Douglas Lee Exam Chair
Name: Academic Unit: Thesis Title: Role:	Mengxiz Liu (PhD Final Oral Examination). August 17 <sup>th</sup> , 2018. The Edward S. Rogers Sr. Department of Electrical & Computer Engineering, University of Toronto. Colloidal Quantum Dots for Solar Energy Conversion. Thesis Supervisor: Dr. Edward Sargent Committee Chair
Name: Academic Unit: Thesis Title: Role:	Andrew Davis (PhD). December 12 <sup>th</sup> , 2017. Medical Physics, McMaster University. Optimization of functional magnetic resonance imaging of skeletal muscle. Advisor: Dr. Michael Noseworthy. Examiner.
Name: Academic Unit: Thesis Title: Role:	Lukas Linde Medical Physics, University of Guelph PhD. January 2016- 2019. Co-supervisor with Dr. J. Srbely Examiner
Name: Academic Unit: Thesis Title: Role:	Sidney Abou Sawan McMaster University PhD. Degree start date: Sept 2018. Co-supervisor The Effect of Amino Acids and Resistance Exercise on the Mechanisms of Muscle Adaptation with Training Examiner
Name: Academic Unit: Thesis Title: Role:	Michael Mazzulla University of Toronto PhD. Degree start date: Sept 2018. Co-supervisor The Development of Oral Amino Acid Traced Models to Study Protein Turnover in Humans Examiner
Name: Academic Unit: Thesis Title:	Conrad Rockell Biomedical Engineering, McMaster University PhD. July 2012-2017. Co-supervisor with Dr. M.Noseworthy

Role:	Examiner
Name: Academic Unit: Thesis Title: Role:	Alireza Akbari Biomedical Engineering, McMaster University PhD. July 2012-2016. Co-supervisor with Dr. M.Noseworthy Examiner
Name: Academic Unit: Thesis Title: Role:	Tea Lulic (PhD Comprehensive Oral Examination, July 28, 2016. Department of Kinesiology, McMaster University). Examiner.
Name: Academic Unit: Thesis Title: Role:	Alyaa Elizbak (PhD). Thesis defense January 27, 2014 Medical Physics, McMaster University. Lower Limb Muscle Assessment Using Diffusion Tensor and Blood Oxygen Level Dependent Imaging. Supervisors: Drs. Noseworthy and Kumbhare. Chair: Dr. T. Hawke, Examiner.
Name: Academic Unit: Thesis Title: Role:	Conrad Rockel (PhD Comprehensive Examination, April 4, 2013 School of Biomedical Engineering. Effects of Vincristine/Prednisone Administration on Skeletal Muscle and Counter Effects of an Exercise Intervention as Assessed by DTI and 31P- MRS. Supervisor: Drs. Noseworthy and Kumbhare, Chair: Dr. John Connelly Examiner.
Name: Academic Unit: Thesis Title: Role:	Alexander Mark Weber (PhD Comprehensive Examination, October 27, 2010) School of Biomedical Engineering Music Medicine as a Conjunctive Psychotherapeutic Treatment for Primary Glioblastoma Multiforme in Adults. Supervisor: Dr. Naom Serani, Chair
Name: Academic Unit: Thesis Title: Role:	Gavin Jones (PhD Comprehensive Examination, June 2, 2010) School of Biomedical Engineering The Effect of Protein Administration on Exercise Induced Changes in Elderly Males. Supervisor: Dr. M. Noseworthy, Chair: Dr. Greg Wohl. Examiner
Name: Academic Unit: Thesis Title:	Mohammed Warsi (PhD Comprehensive Examination, February 4, 2010) School of Biomedical Engineering. Use of Neuroimaging in the Differentiating of Dementias. Supervisor: Dr. M. Noseworthy.

Role:	Chair
Name: Academic Unit: Thesis Title: Role:	Andrew Davis (M.Sc. defense). December 30 <sup>th</sup> , 2009. Medical Physics, McMaster University. Optimization of functional magnetic resonance imaging of skeletal muscle. Advisor: Dr. Michael Noseworthy. Examiner
Name: Academic Unit: Thesis Title: Role:	Sonya Bells (M.Sc. defense) March 22 <sup>nd</sup> , 2006. McMaster University, Medical Physics. Assessment of muscle microvasculature using MRI. Advisor: Dr. Michael Noseworthy. Examiner
Name: Academic Unit: Thesis Title: Role:	Andrew Davis Medical Physics, McMaster University MSc. Sept 2007 – Dec 2009. Primary supervisor Optimization of Functional Magnetic Resonance Imaging of Skeletal Muscle. Examiner

## Professional Reviews [n=1]

Name: Role:	Sukhwinder Kalsi-Ryan 3-Year Review of Scientist, KITE, UHN-Toronto Rehabilitation Institute. August 11, 2020. Committee Member
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**6. PUBLICATIONS****Peer-Reviewed Journal Articles  
Published [n=180]**

1. Zadeh F.S, Koh R.G.L, Dilek B, Masani K, **Kumbhare D**. Identification of Myofascial Trigger Point Using the Combination of Texture Analysis in B-mode Ultrasound with Machine Learning Classifiers. *Sensors*. Accepted/in press Dec 12, 2023
2. Koh, RGL; Khan MA; Rashidiani, S; Hassan, S; Liu, T; Tucci, V; Nesovic, D; **Kumbhare, D**; Doyle, TE. Check It Before You Wreck It: A Guide to STAR-ML for Screening Machine Learning Reporting in Research. *IEEE*. 2023 Sept 15;(11):101567-101579. doi 10.1109/ACCESS.2023.3316019
3. Koh, R.G.L. , Dilek, B, Ye, G, Selver, A, **Kumbhare, D**. Myofascial Trigger Point Identification in B-mode Ultrasound: Texture Analysis vs Convolutional Neural Network Approach. *Ultrasound in Medicine and Biology*. 2023 Oct 1;49(10):2273-2282 <https://doi.org/10.1016/j.ultrasmedbio.2023.06.019>. **Coauthor or Collaborator.**
4. Ye G, Koh RGL, Jaiswal K, Soomal H, **Kumbhare, D**. The Use of Virtual Reality in the Rehabilitation of Chronic Nonspecific Neck Pain: A Systematic Review and Meta-Analysis. *Clin J Pain*, 2023 Sept 1;39(9):491-500. doi: 10.1097/AJP.0000000000001134. **Coauthor or Collaborator.**
5. Danielli E, Simard N, DeMatteo CA, **Kumbhare D**, Ulmer S, Noseworthy MD. A review of brain regions and associated post-concussion symptoms. *Frontiers in Neurology*, 2023 Aug 3;14:1136367. <https://doi.org/10.3389/fneur.2023.1136367>. **Coauthor or Collaborator.**
6. Pradeep A, Biredinc A, Branigan T, Phan V, Morris H, Shah J, DeStefano S, Sikdar S, Srb J, **Kumbhare D**, Stecco A, Paik J, Gerber LH. Evidence for an association of serum microanalytes and myofascial pain syndrome. *BMC Musculoskeletal Disorders*. 2023 Aug 1; 24(1):624. <https://doi.org/10.1186/s12891-023-06744-9>. **Coauthor or Collaborator.**
7. Annaswamy T, Cunniff K, Rizzo JR, Naeimi T, **Kumbhare D**, Batavia M. Methodological Issues Relevant to Blinding in Physical Medicine and Rehabilitation Research. *AmJPMR*. 2023 Mar 13. doi: 10.1097/PHM.0000000000002228. Epub 2023 Mar 3. PMID: 36897811. **Coauthor or Collaborator.**
8. Minuk L, Chohan K, **Kumbhare D**, Reid D, Wentlandt K, Rozenberg D. Symptoms and Disease Severity in Lung transplant candidates co-managed with Palliative Care. *Ann Palliat Med*. 2023 Mar; 12(2):224-335. doi: 10.21037/apm-22-905. **Coauthor or Collaborator.**
9. Hassan, S., Nesovic, K., Babineau, J., Furlan, A., **Kumbhare, D.**, Carlesso, L.C. Identifying Chronic Low Back Pain Phenotypic Domains and Characteristics Accounting for Individual Variation: A Systematic Review. *Pain*. 2023 Oct 1.; 164(10):2148-2190. doi: 10.1097/j.pain.0000000000002911. **Coauthor or Collaborator.**

10. Tesio L, Caronni A, Simone A, **Kumbhare D**, Scarano S. Interpreting results from Rasch analysis 2. Advanced model applications and the data-model fit assessment. *Disabil Rehabil.* 2023 Feb 6. 2023 Feb 6:1-14. doi: 10.1080/09638288.2023.2169772. Epub ahead of print. PMID: 36744832. **Coauthor or Collaborator.**
11. Tesio, L, Caronni, A, **Kumbhare, D**, Scarano, S. Interpreting results from Rasch analysis 1. The “most likely” measures coming from the model. *Disabil Rehabil.* 2023 Feb 5. doi: 10.1080/09638288.2023.2169771. Epub ahead of print. PMID: 36740739. **Coauthor or Collaborator.**
12. Rozenberg, D; Al Kaabi, N; Camacho, E; Nourouzpour, S; Lopez-Hernances, L; McGillis, L, **Kumbhare, D**; et al. Evaluation and Management of Dyspnea in Hypermobility Ehlers-Danlos Syndrome and Generalized Hypermobility Spectrum Disorder: Protocol for a Pilot and Feasibility Randomized Control Trial. *JMIR Research Protocols.* 2023 Mar 20;12:e44832. doi: 10.2196/44832. **Coauthor or Collaborator.**
13. Duarte F, Chien R, Ghazinour G, Murnaghan K, West DWD, **Kumbhare, D**. Myofascial Pain as an Unseen Comorbidity in Osteoarthritis: A Scoping Review of the Literature. *Clin J Pain.* 2023 April 1;39(4):188-201. doi: 10.1097/AJP.0000000000001102. **Senior Responsible Author.**
14. Tesio L, Scarano S, Hassan S, **Kumbhare D**, Caronni A. Why Questionnaire Scores Are Not Measures: A Question-Raising Article. *Am J Phys Med Rehabil.* 2023 Jan 1;102(1):75-82. doi: 10.1097/PHM.0000000000002028. **Coauthor or Collaborator.**
15. Koh RGL, Paul TM, Nesovic K, West D, **Kumbhare D**; Wilson RD. Reliability and Minimal Detectable Difference of Pressure Pain Thresholds in a Pain-Free Population. *British Journal of Pain.* 2023 Jun;17(3):239-243. doi: 10.1177/20494637221147185. **Co-Senior Responsible Author.**
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17. Farag J, Kuwabara A, Sherwood D, **Kumbhare D**. The Physiatrist’s Guide to Cyclist Palsy: A Narrative Review. *AmJPMR.* 2022 Nov 14. **Senior Responsible Author.**
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21. Mazzula M, Hodson N, West D, **Kumbhare D**, Moore D. A non-invasive  $^{13}\text{C}$  breath test detects differences in anabolic sensitivity with feeding and heavy resistance exercise in healthy young males: a randomized control trial. *Applied Physiology, Nutrition, and Metabolism*. 2022 Aug 1;47(8):860-870. doi: 10.1139/apnm-2021-0808.
22. **Kumbhare D**, Hassan S, Diep D; Duarte FCK, Hung J, Damodara S; West DWD, Selvaganapathy R. Potential Role of Blood Biomarkers in Fibromyalgia Patients: A Systematic review with meta-analysis. *Pain*. 2022 Jul 1; 163(7): 1232-1253. Senior Responsible Author.
23. Abou Sawan S, Hodson N, Malowany JM, West DWD, Tinline-Goodfellow C, Brook MS, Smith K, Atherton PJ, Kumbhare D, Moore DR. Trained integrated post-exercise myofibrillar protein synthesis rates correlate with hypertrophy in young males and females. *Med Sci Sports Exerc*. 2022 Jun 1; 54(6): 953-964.
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26. Hassan S, **Kumbhare D**. Validity and Diagnosis in Physical and Rehabilitation Medicine: Critical View and Future Perspectives. *Am J PMR*. 2022 Mar 1; 101(3): 262-269. DOI: 10.1097/phm.0000000000001768
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28. Duarte, F, Funabashi M, Starmer D, Partata W, West D, **Kumbhare D**, Injeyan S. Effects of distinct force magnitude of spinal manipulative therapy on blood biomarkers of inflammation: A proof of principle study in healthy young adults. *J Manipulative Physiol Ther*. 2022 Jan' 45(1):20-32. doi: 10.1016/j.jmpt.2022.03.012

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32. Hodson N, Mazzulla M, Holowaty M, Kumbhare D, Moore D. RPS6 phosphorylation occurs to a greater extent in the periphery of human skeletal muscle fibers, near focal adhesions, after anabolic stimuli. *American Journal of Physiology-Cell Physiology*. 2022 Jan 1;322(1):C94-C110. doi: 10.1152/ajpcell.00357.2021
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35. Linde LD, Bent LR, Dickey JP, Kumbhare DA, Srbely JZ. Exploring the effect of capsaicin induced central sensitization on the upper limb nociceptive withdrawal reflex threshold. *Experimental Brain Research*. 2021 Nov;239(11):3405-15. doi: 10.1007/s00221-021-06216-3
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1. Noseworthy MD, Danielli E, **Kumbhare D**, Simard N, Amador-Tejada A. Why single photon emission computerized tomography (SPECT) is not appropriate for concussion assessment. Submitted to *Frontiers*. Oct 28, 2023.
2. Nella AK, Koh R.G.L, Gignac MA, **Kumbhare D**, Furlan AD. The impact of work-related psychosocial factors on work outcomes in chronic pain patients: a systematic review. Submitted to *Safety and Health at Work*. 2023
3. Koh R.G.L†, Nesovic N†, Ye G, Wilson RD, Dilek B, **Kumbhare D**, “Utilization of U-net and a transfer learning-based approach for automatic region of interest placement in B-mode ultrasound imaging. Submitted to *Journal of BioMedical Engineering OnLine*. 2023
4. Doyle T, Khan Md A, Koh R, Rashidiani S, Liu T, Tucci V, **Kumbhare D**. Cracking the Chronic Pain Code: A Scoping Review of Artificial Intelligence in Chronic Pain Research". *Journal of Biomedical and Health Informatics*. Submitted April 29, 2023
5. Sawan SA, Hodson N, Malowany JM, West DWD, Tinline-Goodfellow C, Brook MS, Smith K, Atherton PJ, **Kumbhare D**, Moore DR. Influence of sex and training on post-exercise integrated myofibrillar protein synthesis, mTOR localization and muscle hypertrophy. Submitted *J Physiol*
6. Joon Mun K, **Kumbhare D**, Mittal N. Second-Order Peer Reviews of Clinically Relevant Articles for the Physiatrist: Is lidocaine-medicated plaster more effective than placebo on localized neuropathic pain after knee surgery? Submitted to *Am J PMR*.

## 7. UNPUBLISHED ABSTRACTS & SCIENTIFIC PRESENTATIONS [n=11]

1. Linde L, Coke J, Dar R, Bent L, Dickey J, **Kumbhare D**, Srbely J. Skin pre-heating increases the effect of capsaicin induced central sensitization. Submitted to Canadian Society for Biomechanics & International Association for the Study of Pain. March 2018
2. Akbari A, **Kumbhare DA**, Noseworthy MD. Effects of exercise on human calf muscle in vivo sodium single and triple Quantum filtered magnetic resonance spectroscopy. Submitted to Imaging Network of Ontario (ImNO). March 30, 2016.
3. Grewal J, Randhawa N, Parkinson WL, Upadhye S, Rathbone M, Adachi J, Rehman Y, **Kumbhare D**. Associations Between Fibromyalgia Clinical Features and Disability Domains Using The Short Form 36. World Institute of Pain, New York, New York. May 2016



4. **Kumbhare D**, Current Concepts in the Diagnosis of Sports Soft Tissue Injuries. 2004 Canadian Society of Exercise Physiology Annual Scientific Conference, Training for High Performance Sport. October 16, 2004.
5. Pierrynowski M, Galea V, Graham N, Gross A, **Kumbhare D**, MacDermid J, Manto L, McLaughlin L, McPhee C, Parkinson W. A new performance outcome measure, the Neck-Walk Index, to classify patients with neck pain or stiffness. Achieving Excellence Through Collaboration Conference, Insurance Bureau of Canada and the Workplace Safety & Insurance Board, September, 2003, Toronto, Ontario, Canada.
6. **Kumbhare D**, Parkinson W, Balsor B, McPhee C, Goyal S, Papaioannou A. Consistency of Primary Care with Guidelines for the Management of Whiplash in Canadians. Poster presentation at the Physiatry Academic Day, University of Toronto, Toronto, Ontario, October 25, 2002.
7. **Kumbhare D**, Balsor B., Parkinson W. Cervical Flexor Endurance: Reliability, Validity, and Responsiveness During Clinical Change. Poster presentation at the Physiatry Academic Day, University of Toronto, Toronto, Ontario, October 25, 2002.
8. **Kumbhare D**, Atlas S, Jurriaans E, Parkinson W, Dunlop B, Boulos P. Comparison of Magnetic Resonance Imagery and Ultrasound Imaging For Diagnosis of Achilles Tendonopathies. Poster presentation at the Physiatry Academic Day, University of Toronto, Toronto, Ontario, October 25, 2002.
9. **Kumbhare D.**, Balsor B., Adachi J., Parkinson W, Bedard M, Robinson J. Normal values for a test of cervical flexor endurance with comparison to whiplash injured patients. Annual Meeting of the Ontario Academic Physiatrists, Toronto, Ontario, October 2001.
10. Balsor B., **Kumbhare D.**, Adachi J., Harding P., Parkinson W. Cervical Flexor Endurance: Reliability, Validity, and Responsiveness During Clinical Change. Annual Meeting of the Ontario Academic Physiatrists, Toronto, Ontario, October 2001.
11. Parkinson W, **Kumbhare D**, Adachi J, Papaioannou A, Bedard M, Goyal S. Physical and Psychosocial Factors in Acute Whiplash Patients. Poster presentation at the Annual Meeting of the Ontario Academic Physiatrists, Toronto, Ontario, October 2001.

#### **Abstracts, Peer Reviewed [n=64]**

1. Koh, R.G.L. , Dilek, B, Ye, G, Selver, A, **Kumbhare, D**. Myofascial Trigger Point Identification in B-mode Ultrasound: Texture Analysis vs Convolutional Neural Network Approach. ACRM program at RehabWeek 2023, Singapore, Sept 2023
2. Upadhye S, Kumbhare D, Caprenter C, Lang E, McLeaod S, Morris J, Ghate G, Yan J, Strobel S, Davies-Schinkel C. Creation of a Novel Evaluation Tool to Manage Conflicts

- of Interest in Clinical Practice Guideline Panels. Canadian Association of Emergency Physicians 2021.
3. Shomal Zadeh, Koh RGL, Aghamohammadi Sereshki A, Hassan S, Nesovic K, Khan AA, Sikdar S, **Kumbhare D**. Texture Analysis of Ultrasound Images Can Characterize Muscle Tissue in Myofascial Pain Syndrome. Engineering Medicine and Biology Conference 2021 – Won top poster of the conference.
  4. Nesovic K, Koh RGL, Aghamohammadi Sereshki A, Shomal Zadeh F, Popovic MR, **Kumbhare D**. Engineering Medicine and Biology Conference 2021
  5. Nesovic K, **Kumbhare D**. A Machine Learning Approach to Ultrasound Image Quality Assessment. ISPRM 2021
  6. Stiver M, **Kumbhare DA**, Agur A. Parsing Out the Relationship Between Contractile and Connective Elements in the Human Trapezius. Presented at American Association of Clinical Anatomists, July 9, 2018
  7. **Kumbhare D**, Grosman-Rimon L, Vadasz B. Poster 166 A Reliability Study of Ultrasound Detection of Myofascial Trigger Points. PM&R. 2016. Picked as top poster from MSK stream at AAPM&R.
  8. **Kumbhare DA**, Upadhye S, Yashpal K, Henry J. Clinical Practice Guideline Awareness and Utilization by Community Physicians treating Chronic Pain: A Comparison Study. Presented at IASP, Brazil, 2014
  9. Akbari A, Rockel CP, **Kumbhare DA**, Noseworthy MD. (October 2013) Evaluation of <sup>31</sup>P Skeletal Muscle Dynamics Induced by Electromyostimulation. ESMRMB, Toulouse, France, October 4, 2013
  10. Akbari A, Rockel CP, **Kumbhare DA**, Noseworthy MD. (2013) An MR-compatible solution for simultaneous electrical muscle stimulation and MR imaging at 3T. (poster) Int. Soc. Magn. Reson. Med. (ISMRM). 21:3560 (January 28th, 2013).
  11. Rockel CP, Akbari A, **Kumbhare DA**, Noseworthy MD. (2013) Temporal diffusion differences between slow-twitch and fast-twitch skeletal muscle following mild exercise. (poster) Int. Soc. Magn. Reson. Med. (ISMRM). 21:3976 (January 28th, 2013).
  12. Rockel CP, Akbari A, **Kumbhare DA**, Noseworthy MD. (2013) Differential diffusion behaviour in human calf muscles following voluntary vs electrically-stimulated contractions. (poster) Int. Soc. Magn. Reson. Med. (ISMRM). 21:4000 (January 28th, 2013).
  13. **Kumbhare D**, Parkinson W, Cherian J, Upadhye S, Adachi J, Sne N, Baillie F. Validity of the Neck Disability Index for Measuring Impairment Following Whiplash. Poster Presented at the American Pain Society Annual Conference, Honolulu, May 2012.

14. Jones G, **Kumbhare D**, Harish S, Noseworthy M. 3T MRI Diffusion Tensor Imaging of the Lumbar Multifidus. Poster Presented at the American Pain Society Annual Conference, Honolulu, May 2012.
15. **Kumbhare D**, Parkinson W, Adachi J, Cherian J, Upahdye S, Baillie F. Psychosocial and Physical Examination Changes over the First 6 Months Following Whiplash. Poster Presented at the American Pain Society Annual Conference, Honolulu, May 2012.
16. **Kumbhare D**, Parkinson W, Upahdye S, Cherian J, Sne N, Baillie F, Adachi J. Reliability and Validity of Spine and Shoulder Measurements Following Motor Vehicle Collisions. Poster presentation at the American Academy of Physical Medicine & Rehabilitation, Orlando, Nov. 2011.
17. **Kumbhare D**, Parkinson W, Cherian J, Upadye S, Baillie F, Sne N, Adachi J. Physical Examination Changes Over the First Six Months Following Motor Vehicle Collisions. Poster presentation at the American Academy of Physical Medicine & Rehabilitation, Orlando, Nov. 2011.
18. Parkinson W, **Kumbhare D**, Thompson A, Adachi J. Predictive Validity Of The Westhaven Multidimensional Pain Inventory. Poster presentation at the American Academy of Physical Medicine & Rehabilitation, Orlando, Nov. 2011.
19. Jones GEG, Noseworthy MD, **Kumbhare DA**. (2011) Diffusion imaging (DTI) of human lower back muscles at 3.0T. *European Society for Magnetic Resonance in Medicine and Biology (ESMRMB)* (oral presentation; accepted July 5th, 2011). 28:313.
20. **Kumbhare D**, Parkinson W, Upahdye S, Branny S, Christenson E, Chlebus M, Lammers B, Adachi J. Measurement Properties in Physical Examination of the Upper Extremities Following Motor Vehicle Accident Related Injury. International Society for Physical Rehabilitation Medicine Annual Meeting, San Juan, Puerto Rico, June 2011.
21. **Kumbhare D**, Parkinson W, Cherian J, Baillie F, Sne N, Adachi JD, Dunlop RB. Six Month Musculoskeletal Recovery Following Motor Vehicle Accident Related Injury. International Society for Physical Rehabilitation Medicine Annual Meeting, San Juan, Puerto Rico, June 2011.
22. **Kumbhare, D**, Buwan, H, Chia, J, O'Neill, J. Comparison of Ultrasound, Magnetic Resonance Imaging, and Digital Radiography in the Detection of Pathological Subtypes in Chronic Achilles Tendinopathy: A Prospective Case Series. *PM&R*, vol1, 9S, s157, 2009.
23. **Kumbhare, D**, Harish, S, Thomas, J, Williams, R. Idiopathic Chondrolysis of the Hip in a Young Twin Female with Blount's Disease: A Report and Review of Literature. *PM&R*, vol1, 9S, s164, 2009.

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25. **Kumbhare D**, Adili A, Parkinson W, Richards C, Mathoo J. Prediction of Hospital Length of Stay Following Knee Replacement Surgery. Accepted for presentation at the American Academy of Physical Medicine & Rehabilitation Annual Meeting, November 2008.
26. **Kumbhare D**, Adili A, Parkinson W, Richards C, Mathoo J, Kerr C, Adachi J. Injury Measurement Properties of Circulating Interleukin-6 And Oncostatin-M For Quantifying Musculoskeletal Injury. Accepted for presentation at the American Academy of Physical Medicine & Rehabilitation Annual Meeting, November 2008.
27. Adili A, **Kumbhare D**, Parkinson W. Use of Circulating Cytokines to Gauge Trauma Following Knee Arthroplasty. Accepted for presentation at the Canadian Orthopedic Association Annual Meeting, 2009.
28. Adili A, **Kumbhare D**, Parkinson W. Association of Trauma Biomarkers With Hospital Length of Stay Following Knee Arthroplasty. Accepted for presentation at the Canadian Orthopedic Association Annual Meeting, 2009.
29. Dunlop RB, Buckley N, **Kumbhare D**, Parkinson W. Construct Validity of Biochemical Measurement For Muscle Injury. Accepted for presentation at the Canadian Orthopedic Association Annual Meeting, 2009.
30. Dunlop RB, **Kumbhare D**, Parkinson W, Richards C. Comparison of Serum Interleukin-6 and Creatine Kinase Concentrations Following Lumbar Decompression Surgery. Accepted for presentation at the Canadian Orthopedic Association Annual Meeting, 2009.
31. Parkinson WL, **Kumbhare D**, Dunlop RB. Construct Validity of Biochemical Measurement For Muscle Injury. Scheduled presentation at the American Academy of Physical Medicine and Rehabilitation (AAPMR) Annual Meeting, Boston, Sept. 2007. *Arch Phys Med Rehabil*, November 2007, In Press.
32. Parkinson WL, Krames L, **Kumbhare D**, D'Arcy B, Gronkowska G, Balsor B. Use of pedometers in chronic pain: associations with self-reported coping measures. Poster presentation at the American Academy of Physical Medicine and Rehabilitation (AAPMR) Annual Meeting, Honolulu, Hawaii, Nov. 2006. *Arch Phys Med Rehabil*, November 2006. - *Certificate awarded at the AAPMR Meeting by The Physiatric Association of Spine, Sports and Occupational Rehabilitation (PASSOR) for "excellence and scientific merit most consistent with the goals of PASSOR"*.
33. **Kumbhare D**, Adili A, Parkinson W, Denkers M, Mathoo J. Measurement of Muscle Injury in Knee Replacement Surgery. Scheduled presentation at the American Academy

of Physical Medicine and Rehabilitation (AAPMR) Annual Meeting, Boston, Sept. 2007. Arch Phys Med Rehabil, November 2007, In Press.

34. **Kumbhare D**, Parkinson W, Dunlop B, Richards C, Mathoo J. Comparison of Serum Interleukin-6 and Creatine Kinase Concentrations Following Lumbar Decompression Surgery. Scheduled presentation at the American Academy of Physical Medicine and Rehabilitation (AAPMR) Annual Meeting, Boston, Sept. 2007. Arch Phys Med Rehabil, November 2007, In Press.
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37. Denkers M, Dunlop B, Missiuna P, **Kumbhare D**, Parkinson W. Creatine kinase as a measure of soft tissue injury during lumbar surgery Canadian Orthopedics Association Annual Meeting, Toronto, June 2006.
38. Takeuchi L, McDonald E, Clarke F, Heels-Andsell D, Tarnolpolsky M, **Kumbhare D**, Cook DJ. Creatine supplementation in mechanically ventilated patients: a randomized double blind placebo controlled pilot trial. American Thoracic Society International Conference, San Diego, California, May 2005, Abstract No. 854.
39. Pierrynowski M, Galea V, MacDermid J, Gross A, **Kumbhare D**, Parkinson W, Teo A, Missiuna P, McLaughlin L, McPhee C, Graham N, Lee A and Marley T. The head and neck, shoulder, arm research group conceptual framework. The Changing Face of Physiotherapy, 2005 Orthopaedic Symposium, Canadian Physiotherapy Association, London, Ontario 28-30, 2005.
40. Pierrynowski M, Gross A, Galea V, MacDermid J, McLaughlin L, Graham N, **Kumbhare D**, Parkinson W [and HaNSA]. Sensitivity of the Neck-Walk Index to detect change in patients with mechanical neck disorders. The Changing Face of Physiotherapy, 2005 Orthopaedic Symposium, Canadian Physiotherapy Association, London, Ontario 28-30, 2005.
41. **Kumbhare D**, O'Neill J, Atlas S, Jurriaans E, Friedman L, Finlay K, Parkinson W, Boulos P. Agreement between magnetic resonance imagery and ultrasound for identifying Achilles' tendonopathies. Arch Phys Med Rehabil 2004;85:Abstract No. 20.
42. Pierrynowski M, **Kumbhare D**, Galea V, Gross A, MacDermid J, McLaughlin L. The neck-walk index: a new performance outcome measure that identifies patients with neck

pain or stiffness. Arch Phys Med Rehabil 2004;85:Abstract No. 46.

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44. Guy S, McDowell J, Ruttan P, Stevenson B, Turner L, Vair R, Galea V, Graham N, Gross A, **Kumbhare D**, MacDermid J, Manto L, McLaughlin L, McPhee C, Parkinson W, Pierrynowski, M, The Neck-Walk Index indentifies patients with mechanical neck disorders. 8<sup>th</sup> International Federation of Orthopaedic Manual Therapists Conference, Cape Town, South Africa, March 2004.
45. Buck S, Cheung G, Lundquist L, Tang B, Zavitz K, Galea V, Graham N, Gross A, **Kumbhare D**, MacDermid J, Manto L, McLaughlin L, McPhee C, Parkinson W, Pierrynowski M. Upper limb function in patients with mechanical neck disorders. 8<sup>th</sup> International Federation of Orthopaedic Manual Therapists Conference, Cape Town, South Africa, March 2004.
46. **Kumbhare D**, Conquer J, Barban J, Tannis A, Brown L, Adachi J, Parkinson W. Effects of glucosamine on pain and functioning in Canadians with Osteoarthritis of the Knee. Arch Phys Med Rehabil, Vol 84(9),Poster 28, Oct. 2003.
47. **Kumbhare D**, Bayley M, Muhn N, Parkinson W, Papaioannou A, Balsor B. Correlates of Achilles tendon pain in runners. Arch Phys Med Rehabil, Vol 84(9)Poster 65, Oct. 2003.
48. P Boulos, K Beattie, C Gordon, F Jurrianns, **D Kumbhare**, E Kaminska. Minimum Medial Joint Space Width Reproducibility Using on Automated Technique. Journal of Rheumatology. 2002;29(7):1566.
49. **Kumbhare D**, Atlas S, Jurriaans E, Parkinson W, Dunlop B, Boulos P. Comparison of Magnetic Resonance Imagery and Ultrasound Imaging For Diagnosis of Achilles Tendonopathies. Abstract – Arch Phys Med Rehabil, Vol 83:1671; Nov. 2002
50. **Kumbhare, D**, Parkinson, W, Balsor, B, McPhee, C. Consistency of care with guidelines for the management of whiplash in Canadians. Archives of Physical Medicine and Rehabilitation, Nov. 2002, 83(11). Abstract No. 153.
51. **Kumbhare D**, Balsor B, Parkinson W, Harding P, Adachi J, Bedard M. Measurement Validity and Prediction of Normal Values for Cervical Flexor Endurance. Abstract – Arch Phys Med Rehabil, Vol 83:1666; Nov. 2002.
52. Parkinson W, **Kumbhare D**, Balsor B, Papaioannou A, Adachi J, Goyal S. “Comparison of the Effects of Physical Impairment and Social Stress on Depression Following Acute Whiplash”. Abstract - Arch Phys Med Rehabil, Vol 83:1671; Nov.

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53. Papaioannou A, Adachi JD, Ferko N, Ioannidis G, **Kumbhare, D**, Jurriaans E, Probyn G, Cox, Parkinson W, Stephenson G. Prevalence and Severity of Vertebral Fractures Among Patients with Chronic Obstructive Pulmonary Disease (COPD) in Canada. Annual Meeting of the American Society of Bone and Mineral Research, Vol 17 September 2002.
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55. **Kumbhare D**, Parkinson W, Balsor B, McPhee C, Goyal S, Papaioannou A. Consistency of Primary Care with Guidelines for the Management of Whiplash in Canadians. Poster presented at the 1<sup>st</sup> Annual Meeting of the Physical Medicine Research Foundation, Markham, Ontario, Canada, September, 2002.
56. **Kumbhare D**, Parkinson W, Balsor B, Krames L, Adachi J, Goyal S. Effects of Physical Impairment and Social Stress on Depression Following Acute Whiplash. Poster presented at the 1<sup>st</sup> Annual Meeting of the Physical Medicine Research Foundation, Markham, Ontario, Canada, September, 2002.
57. **Kumbhare D**, Atlas S, Jurriaans E, O'Neil J, Parkinson W, Dunlop B, Boulos P. Diagnosis of Achilles Tendonopathies Using Magnetic Resonance Imagery Versus Ultrasound. Poster presented at the 1<sup>st</sup> Annual Meeting of the Physical Medicine Research Foundation, Markham, Ontario, Canada, September, 2002.
58. **Kumbhare D.**, Balsor B., Adachi J., Parkinson W, Bedard M, Robinson J. Cervical Flexor Endurance: Measurement properties in patients with and without neck pain. Annual Meeting of the Canadian Physiotherapy Association, Poster, Calgary, Alberta, July 2001.
59. Balsor B., **Kumbhare D.**, Adachi J., Harding P., Parkinson W. Cervical Flexor Endurance: Reliability, Validity, and Responsiveness During Clinical Change. Annual Meeting of the Canadian Physiotherapy Association, Podium presentation, Calgary, Alberta, July 2001.
60. **Kumbhare D**, Parkinson W, Balsor B, Bedard M, Papaioannou A, Adachi JD. Association of Depression in Acute Whiplash Patients with Physical and Psychosocial Stress. American Academy of Physical Medicine and Rehabilitation, Annual Meeting Proceedings, Sept. 2001 Abstract No. 01-A-1415
61. **Kumbhare D**, Balsor B, Parkinson W, Harding P, Adachi J, Robinson J. Normal Values for Endurance of the Cervical Flexors with Comparison to Whiplash Patients. American Academy of Physical Medicine and Rehabilitation, Annual Meeting Proceedings,

Abstract No. 01-A-1271, Sept. 2001.

62. **Kumbhare D.**, Balsor B., Harding P, Adachi J., Parkinson W, Bedard M, Robinson J. Cervical Flexor Endurance: Measurement properties in patients with and without neck pain. Annual Meeting of the American Pain Society, Atlanta, GA, Nov. 2000, Abstract No. 751.
63. Balsor B., **Kumbhare D.**, Adachi J., Harding P., Parkinson W, Robinson J, Bedard M. Cervical Flexor Endurance: Reliability, Validity, and Responsiveness During Clinical Change. Annual Meeting of the American Pain Society, Atlanta, GA, Nov. 2000, Abstract No. 750.
64. Parkinson Wm., Caspersen E., **Kumbhare D.**, Dunlop B., Allega R., Adachi J., Papaioannou A., Cott A. "Incidence of treatable psychosocial problems in early back pain disability". Poster presented to the Canadian Pain Society, Niagara-on-the-Lake, May 23, 1997. Abstract #48-Journal Canadian Pain Society, 1997;2(1): 62.

#### **Hand and Neck, Shoulder, Arm (HaNSA) Team Presentations [n=5]**

1. MacDermid J, Galea V, Pierrynowski M, Gross A, McLaughlin L [and HaNSA]. The relationship between quantitative sensory tests or electrophysiology and disability in patients with mechanical neck disorders. The Changing Face of Physiotherapy, 2005 Orthopaedic Symposium, Canadian Physiotherapy Association, London, Ontario 28-30, 2005.
2. Teo A, Galea V, MacDermid J, Gross A, McLaughlin L, Pierrynowski M [and HaNSA]. Performance of patients with mechanical neck disorder on a reach and grasp task: neural strategies. The Changing Face of Physiotherapy, 2005 Orthopaedic Symposium, Canadian Physiotherapy Association, London, Ontario 28-30, 2005.
3. Teo A, Galea V, MacDermid J, Gross A, McLaughlin L, Pierrynowski M [and HaNSA]. Performance of patients with mechanical neck disorder on a reach and grasp task: coordination dynamics. The Changing Face of Physiotherapy, 2005 Orthopaedic Symposium, Canadian Physiotherapy Association, London, Ontario 28-30, 2005.
4. Galea V. (and HaNSA) Implications of mechanical neck disorder on motor control of the arm and hand. Is this a problem with disruptions in coordination? Invited presentation, Occupational Therapy Physiotherapy Symposium Ergotherapie Physiotherapie, McMaster University, 16-18 January 2004.
5. Galea V. (and HaNSA) Implications of mechanical neck disorder on motor control of the arm and hand. Invited presentation, Canadian Physiotherapy Association Orthopaedic Division 2003 Symposium "Research and Practice: Making It Fit". Victoria, BC, 25, 26 October 2003.

#### **Conference Papers [n=2]**



1. Shomal Zadeh, Koh RGL, Aghamohammadi Sereshki A, Hassan S, Nesovic K, Khan AA, Sikdar S, **Kumbhare D**. Texture Analysis of Ultrasound Images Can Characterize Muscle Tissue in Myofascial Pain Syndrome. Engineering Medicine and Biology Conference 2021
2. Nesovic K, Koh RGL, Aghamohammadi Sereshki A, Shomal Zadeh F, Popovic MR, **Kumbhare D**. Ultrasound Image Quality Evaluation using a Structural Similarity Based Autoencoder. Engineering Medicine and Biology Conference 2021.

### **Presentations**

Database and future collaborations. II Einstein International Symposium on Integrated Pain Management, 24 November 2023, Brazil. Invited Presentation

Malpractice in Pain Medicine. Co-organizer with Phillip Peng. Toronto, ON. September 19, 2015. University of Toronto.

### **TECHNICAL PAPERS**

Parkinson W, Kumbhare D, Dunlop RB, Balsor B. Response to the Liberal Government request for stakeholder submissions on their plan to remove the designated assessment center model for handling disputes related to auto insurance related injuries. Submitted on behalf of the Center For Acute Injury Rehabilitation, St. Joseph's Hospital, December 2004.