

CURRICULUM VITAE

Stuart Michael McGill

**Spine Biomechanist and “University Professor Emeritus”
Retired July 1 2017**

Chief Scientific Officer:
Backfitpro Inc.

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April 2019

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Formerly: Spine Biomechanics Laboratories
Department of Kinesiology
Faculty of Applied Health Sciences
University of Waterloo
Waterloo, Ontario, Canada
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STUART MICHAEL McGILL

Brief Description

Stuart McGill is a Professor Emeritus (Spine Biomechanics) at the University of Waterloo. As a professor for 30 years he explored low back mechanics of both intact humans (both normal and injured people) and harvested tissues (where specific injuries are created and analysed). He has been the author of many scientific journal papers that address the issues of lumbar function, low back injury mechanisms, investigation of tissue loading during rehabilitation programs, the formulation of work-related injury avoidance strategies and high performance training. He mentored over 37 graduate students. This work has received several international awards including the “Volvo Bioengineering Award for Low Back Pain Research” in 1986. As a consultant, he has provided expertise on low back injury to various government agencies, many corporations and legal firms and professional/international athletes and teams world-wide. He is regularly referred special patient cases from the international medical community for opinion (Clinic now in Gravenhurst Ontario). At the University of Waterloo he taught courses in Occupational Biomechanics (reducing the risk of occupationally related musculoskeletal disorders), General Biomechanics, Injury Biomechanics, Low Back Disorders, and graduate level courses in Advanced Biomechanics, and Instrumentation and Signal Processing. He was the President of the Canadian Society for Biomechanics for 1999-2000, was an elected member of the executive for the International Society for Biomechanics 1999-2001, and was Chair of the Department of Kinesiology 2003-2009. He sat on the editorial boards of the journals SPINE, Clinical Biomechanics, and Journal of Applied Biomechanics. He has authored five books: one for the lay public with back pain, *Back Mechanic*; and for clinical readers: “*Low Back Disorders: Evidence Based Prevention and Rehabilitation*”, “*Ultimate Back Fitness and Performance*” and co-authored a textbook for high school students on personal fitness, and another for strength athletes recovering from back injury “*Gift of Injury*”. He lives with his wife Kathryn and dog Tico in Gravenhurst, Ontario.

Degrees

Ph.D. (Kinesiology (Biomechanics))
University of Waterloo, 1986

M.Sc. (Kinanthropology (Biomechanics))
University of Ottawa, 1982

BPHE, University of Toronto, 1980

Certification

C.K. Certified Kinesiologist, Ontario Kinesiology Association, 2002 - 2013

Professional Positions Held

| | |
|--------------------|--|
| 2010- 2017 | "University Professor" - University of Waterloo |
| 2002- Present | Chief Scientific Officer - Backfitpro Inc. |
| 2014- 2017 | Cross-appointed, School of Public Health |
| 2003May-2009July | Chair – Department of Kinesiology |
| 2002July-2003April | Associate Chair for Graduate Studies, Department of Kinesiology, University of Waterloo |
| 1999-2009 | Graduate Faculty, University of Toronto, Institute of Medical Science |
| 1998-2006 | Graduate Faculty, Southern California University of Health Sciences, Los Angeles |
| 1996-2010 | Professor, Department of Kinesiology, University of Waterloo |
| 1995-2013 | Cross-Appointed, Dept. of Mechanical Engineering, University of Waterloo |
| 1994 | “Guest Professor” - Faculty of Medicine, University of Bern, Switzerland |
| 1991-1996 | Associate Professor (tenured), Department of Kinesiology, University of Waterloo |
| 1987-1991 | Assistant Professor - Biomechanics, University of Waterloo |
| 1986-1987 | Research Assistant Professor - Biomechanics, University of Waterloo |
| 1986 | Research Associate - Occupational Biomechanics, University of Waterloo |
| 1985-Present | Part time consultant, S.M. McGill and Associates |

Academic Awards and Honors

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| 2018 | Lifetime Achievement Award, Society of Weight Training Injury Specialists |
| 2017 | Licht Lecture, University of Minnesota School of Medicine. |
| 2016 | Best fitness articles of 2016 in PTDC.com (Personal Trainers Development Centre). A Trainer’s Guide to Help Manage and Fix Lower Back Pain. |
| 2016 | Basic Research Paper Award for 2015, Global Spine Journal, “ <i>Annulus Fibrosus Can Strip Hyaline Cartilage End Plate from Subchondral Bone: A Study of the Intervertebral Disk in Tension</i> ” |
| 2016 | The 2016 Liberty Mutual Award, Top paper published in Ergonomics for the year “Can fitness and movement quality prevent back injury in elite task force police officers? A 5-year longitudinal study.” |
| 2015 | Fellow: Canadian Academy of Health Sciences (CAHS) |
| 2013 | Award of Excellence in Graduate Supervision, University of Waterloo |
| 2013 | Top Presentation Award (Sidorkewicz, Cambridge, McGill), Int Society for Study of the Lumbar Spine, Phoenix USA |
| 2013 | Top Poster Presentation Ontario Kinesiology Association (Sidorkewicz, |

- Cambridge, McGill)
- 2010 Research Excellence Award, Ontario Kinesiology Association
- 2010 Appointed “University Professor” at University of Waterloo- one of 14 active professors university-wide. “To recognize exceptional scholarly achievement and international pre-eminence of UW’s most accomplished faculty members.”
- 2009 Appointed by the Minister of Health to form the College of Kinesiology for professional practice
- 2009 Listed in Global Directory of Who’s Who
- 2009 Best Presentation Award, International Society for Study of the Lumbar Spine, Miami, USA
- 2008 President’s Award, Ontario Kinesiology Association
- 2008 Outstanding Performance Award, University of Waterloo
- 2007 Awarded designation “Speaker of the Royal College of Physicians and Surgeons of Canada”
- 2005 Outstanding Performance Award, University of Waterloo
- 2005 R. Tait McKenzie Award, AAPHERD, USA
- 2004 Elected Fellow, Canadian Society for Biomechanics
- 2004 Career Award: Canadian Society for Biomechanics
- 2002 “Richard W. Stow Visiting Lectureship”, Ohio State University College of Medicine, Department of Phys. Med. And Rehab.
- 2002 “Presidents Circle Lecture for 2002”, University of Waterloo
- 2002 Hallman Professorship – University of Waterloo
- 2002 “Inaugural Professor”, Opened the first Masters in Physical Therapy Program in Portugal, Technical University of Lisbon.
- 2001 “Steven Rose Lecturer”, Washington University School of Medicine, Program in Physical Therapy, St. Louis, U.S.A.
- 2001 “President’s Lecturer”, American College of Sports Medicine, Baltimore, U.S.A.
- 2001 Ontario Innovation Trust Award - for the “Live Fire Research Facility” P.I. Dr. E. Weckman, with Drs. A. Strong, D. Johnson, M. Sharratt, R. Hughson and S. McGill.
- 1998 Wood Distinguished Visiting Lectureship in Joint Injury Research, Dept. of Orthopaedics, Faculty of Medicine, University of Calgary
- 1997 EJ Wells Bequest Lecturer - University of Queensland, Australia
- 1989 3M Award for Presentation Excellence (top paper - Human Factors Association of Canada)
- 1988 Listed in Canadian Who's Who
- 1986 Volvo Bioengineering Award for Low Back Pain Research (International Society for Study of the Lumbar Spine)
- 1986 Waterloo Alumni Gold Medal (top graduating Ph.D. student, university-wide)
- 1986 Julian Christensen Award for Ph.D. level ergonomics research (Human

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| | Factors Association of Canada) |
| 1985-1986 | University of Waterloo Graduate Scholarship |
| 1983-84/1984-85 | NSERC Postgraduate Scholarship |
| 1983-84, 1984-85 | Ontario Graduate Scholarship |
| 1982 | University of Waterloo Entrance Scholarship |
| 1978-1979 | Alumni Prize, University of Toronto (top male student in class) |

Scholarly and Professional Activities

a) Professional Activities:

Canadian Society of Biomechanics:

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| Fellow | 2004-Present |
| President | 1999-2000 |
| Member | 1981-2004 |
| Elected member at large - executive council | 1994-1996 |
| Conference Chair | 1996-1998 |

International Society for Study of the Lumbar Spine (Closed Membership)

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| Member | 1996-2017 |
| Regional Representative for Canada (Executive Committee) | 2013 - 2016 |

Association of Canadian Ergonomists
(formerly: Human Factors Association of Canada)

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| Full Member | 1985-2008 |
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International Society of Biomechanics

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| Member | 1983-2015 |
| Elected to the Executive Board (Awards Portfolio) | 1999-2001 |

International Sport and Spine Society – Board of Directors 2005-Present

Member of the International Advisory Board – The New Zealand Centre for Physiotherapy Research 2005-Present

Member of Advisory Board – Ontario Kinesiology Association 2007-2011

Member of Advisory Board – Boston Sports Medicine and Performance Group
Basketball Advisory Board 2010 - Present

b) Refereeing:

Journal of Biomechanics

Spine
Clinical Biomechanics
Journal of Biomedical Engineering
International Journal of Industrial Ergonomics
Ergonomics
Canadian Journal of Rehabilitation
Journal of Orthopaedic Research
Gait and Posture
Journal of Applied Biomechanics
American Industrial Hygiene Association Journal
Occupational Medicine
IEEE Transactions on Rehabilitation Engineering
European Spine Journal Applied Ergonomics
Physical Therapy
CRC Press
Journal of Biomechanical Engineering
Research Quarterly for Exercise and Sport
Human Factors
Applied Mechanics Reviews
Journal of Applied Physiology
Human Kinetics Publishers
Journal of Neurophysiology
Lancet
Medical Engineering and Physics
Journal Physiology
Journal of Orthopaedic and Sports Physical Therapy
Medicine Science Sports and Exercise
Physiotherapy Theory and Practice
European Spine Journal
Archives of Physical Medicine and Rehabilitation

c) International Review Panels:

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| 1. NIOSH-NIH Grant Review Panel | 2002 |
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d) National Review Panels:

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| 1. NSERC Member of Biological Systems and Functions Evaluation Group | 2012-2015 |
| 2. CIHR (Canadian Institute for Health Research), Movement and Exercise Grants Review Panel | 2008-2009 |

e) Grant Reviews:

1. Netherlands organization for Health Research and Development, Holland
2. National Health and Medical Research Council, Australia
3. National Institute for Health (NIH), USA
4. Natural Sciences and Engineering Research Council of Canada
5. Health and Welfare Canada
6. Science Council of British Columbia
7. Medical Research Council, Canada
8. Alberta Heritage Foundation for Medical Research
9. Whitaker Foundation for Medical Research, U.S.A.
10. Réseau provincial de research en adaptation - réadaptation - IRRST, Quebec
11. Canadian Institutes for Health Research
12. Workplace Safety and Insurance Board, Ontario
13. National Institute of Occupational Safety and Health, U.S.A.
14. The Wellcome Trust, England.

f) Editing:

1. Member of Editorial Board - SPINE 1993-2016
2. Member of Editorial Board - Clinical Biomechanics 1990-2016
3. Consulting Editor – Journal of Applied Biomechanics 2002-2016

g) External Reviewer for Tenure, Promotion and Program Review:

1. Harvard Medical School 2015
2. University of Oregon, Labour Education and Research Center 2015
3. Queen's University, School of Rehabilitation Therapy 2014
4. McMaster University, Department of Kinesiology 2013
5. University of Alberta, Department of Physical Therapy 2013
6. Colorado State University, School of Biomedical Engineering 2013
7. Washington University, St. Louis, Dept. of Medicine 2013
8. University of Massachusetts, Dept. of Kinesiology 2010
9. University of Pennsylvania, Dept. of Bioengineering 2010
10. University of Bristol, Medical Sciences 2010
11. University of Vermont, Rehabilitation Sciences 2008
12. University of Alberta, Dept. of Physical Therapy 2008
13. University of Vermont, School of Physical Therapy 2008
14. Washington University at St. Louis, School of Physical Therapy 2007
15. University of Delaware, Dept. of Mechanical Engineering 2007
16. University of Calgary, Civil Engineering 2007
17. University of Regina, Faculty of Kinesiology 2007
18. University of Dayton, Dept. of Biomedical Engineering 2006
19. University of Utah, Dept. of Physical Therapy 2005
20. Program Review – University of Queensland – School of Human Movement Studies

2005

21. University of Pittsburgh, Dept. of Physical Therapy 2005
22. University of Southern California, Department of Kinesiology 2005
23. University of Vermont, Dept. of Mechanical Engineering 2004
24. Ohio State University, College of Medicine and Public Health 2003
25. University of Delaware, Dept. of Physical Therapy 2003
26. University of Cincinnati, Dept. of Environmental Health 2003
27. University of Southern California, Dept of Biokinesiology and Physical Therapy 2003
28. University of Calgary, Department of Mechanical Engineering 2002
29. University of Vermont, Department of Mechanical Engineering 2002
30. University of Texas, School of Medicine 2002
31. Southern Cross University, School of Exercise Science & Sports Management, Australia

2002

32. University of Queensland, School of Human Movement Studies 2002
33. Program Review – Department of Kinesiology, University of Calgary 2002
34. University of Washington, Department of Mechanical Engineering 2002
35. University of Calgary, Faculty of Engineering 2002
36. University of Virginia, School of Medicine 2001
37. University of Iowa, Department of Biomedical Engineering 2001
38. University of British Columbia 2000
39. Arizona State University, U.S.A., Department of Exercise Science 2000
40. British Guidelines - Occupational Health Guidelines for management of low back pain - Evidence review 2000
41. Program Review - Danish National Institute of Occupational Health- Department of Physiology

2000

42. Ohio State University, USA, Dept. of Industrial Engineering 1998
43. University of Alberta, Department of Physical Therapy 1997
44. Ohio State University, USA,
Department of Industrial and Welding Engineering
1996
45. Queen’s University, Department of Mechanical Engineering 1995

h) Expert Knowledge Source

1. CSEP - PATH, Canadian Society for Exercise Physiology- Physical activity training for health 2013
2. Movement/Fitness Charts and Teachers Resource, and Functional Fitness Charts grades 9-12. Thompson Educational Publications. 2012
3. Movement/Fitness Charts and Teachers Resource, for kindergarten to grade 6 students, Thompson Educational Publications. 2012
4. and Functional Fitness Charts grades 9-12. Thompson Educational Publications. 2012
5. American Physical Therapy Association Subject Matter Expert: “Low Back Assessment,

- Injury Mechanisms and Therapeutic Exercise Prescription” 2011
6. American Physical Therapy Association Content Expert Reviewer: “Clinical practice guidelines linked to the international classification of functioning, disability, and health.” 2011

a) Government:

1. US Navy 2011-2012, 2017
2. Canadian Military (Special Forces) 2012
3. Ontario College of Kinesiology: Transitional Council to establish the professional college
2009
- 2011
4. Institute for Occupational Medicine, U.K. 2001
5. National Research Council - Commission on Behaviour and Social Sciences and
Education, Washington, U.S.A. 2000
6. Danish National Institute of Occupational Health, Copenhagen, Denmark 2000
7. National Institute for Occupational Safety and Health, Morgantown, West Virginia,
U.S.A. 1996
8. Government of Manitoba, Labour, Winnipeg 1994
9. Government of Alberta, Occupational Health and Safety, Edmonton 1993
10. Province of British Columbia, Workers Compensation Board 1993, 1998
11. Ontario Ministry of Labour, Toronto, Ontario 1991
12. Ontario Ministry of Health, Toronto, Ontario 1991

b) Industry

1. Ongoing – many recent consults

c) Legal:

Ongoing – provided expertise in many legal cases involving low back injury, medical malpractice, and compensation issues.

d) Clinical:

Ongoing - evaluations of many referred patients, opinions requested on medical management. These tend to be for patients who have not responded to any type of therapy or they are elite athletes.

Major Conference Organization:

1. Program Committee, Fifth Interdisciplinary World Congress on Low Back and Pelvic Pain – Effective Diagnosis, and Treatment, Melbourne, Australia, November 2004.
2. Conference Chair, North American Conference on Biomechanics, Waterloo, ON, August 14-19, 1998.
3. Program Chair, Human Factors Association of Canada Annual Conference, Waterloo, ON, October 23-26, 1996.

National and International Committees:

1. Canadian Chiropractic Association - Research Committee, March 1997 - March 2001.
2. National Institute for Occupational Safety and Health (NIOSH), USA, Review of Back Belts, 1996.

Coaching:

2018 Avizaqqua international rowing center, Avis, Portugal.

Previous: Many Olympic programs, Strength and conditioning programs in NFL, NCAA, NHL, MMA camps, powerlifting clubs, to name a few.

Other:

Producer of Video “Low Back Exercises for Seniors”,
University of Waterloo, 1996.

PUBLICATIONS

Summary: Books = 5
Chapters in books = 25
Full refereed journal papers = >240
Refereed conference papers = >140
Keynote addresses = >70
Other invited addresses = 400 plus
Self-initiated addresses = 150 plus

A) **Books**

1. **McGill, S.M.**, and Carroll, B., Gift of Injury, Backfitpro Inc, (www.backfitpro.com), 2018.

2. **McGill, S.M., (2015)** Back Mechanic: The step-by-step McGill method to fix back pain. Backfitpro Inc, (www.backfitpro.com).
Now printed in German, Dutch, Czech, Spanish, Italian, Korean, Chinese, Slovenian, Serbian.
3. Augaitis, R. Kell, R. Kourtis, G., **McGill, S.M.**, Whitmarsh, L. Springle, N. Personal Fitness: Faster, Stronger, Smarter. Textbook for High School Curriculum, Thompson Books, Toronto, 2013
4. **McGill, S.M.** Ultimate back fitness and performance, Backfitpro Inc., Waterloo, Canada, 2004. ISBN 0-9736018-0-4 (www.backfitpro.com). Sixth edition 2017.
5. **McGill, S.M.** Low back disorders: Evidence based prevention and rehabilitation, Human Kinetics Publishers, Champaign, IL, U.S.A., 2002. ISBN 0-7360-4241-5, Third Edition, 2016.
Now also printed in Japanese, 2003
Now also printed in Chinese, 2009.

B) Clinical Videos's

1. **McGill, S.M.**, Back exercises for Seniors, Univ of Waterloo, 1996.
2. **McGill, S.M.**, The Ultimate Back: Enhancing Performance (www.backfitpro.com), 2010
3. **McGill, S.M.**, Clinical Techniques for the Ultimate Back: Assessment and Therapeutic Exercise (www.backfitpro.com), 2007. Second Edition 2012.
4. Stuart McGill, Gray Cook & Craig Liebenson, Assessing Movement Video, On target publications, (<http://www.otpbooks.com>). 2014
5. Stuart McGill & Lee Brandon, New Science of Golf, (www.backfitpro.com), 2015
6. McGill S.M. and Bielak, P., Superstiffness for Combative Athletes: Enhance injury resilience and improve performance. (www.backfitpro.com), 2018

C) Commissioned Papers and Position Papers

1. **McGill, S.M.** There is no such thing as non-specific back pain. A position paper written

for the Centre of Research Excellence: Musculoskeletal Disorders. Faculty of Applied Health Sciences, University of Waterloo, 2016.

2. **McGill, S.M.** On the link between occupationally related musculoskeletal loading and low back injury. Commissioned paper for the Commission on Behavioral and Social Sciences and Education, National Research Council and Institute of Medicine, USA, March, 2000.

D) Full Refereed Journal Papers

*Indicates first authors who were students at time of development of the paper.

1. Brendan L. Pinto* and Stuart M. McGill (submitted March 2019) Voluntary muscle relaxation can improve counter-movement jump performance. *J Sports Sci.*
2. Cannon, J., Cambridge, E., McGill, S.M., (in press, 2019) ACL Injury Mechanisms and the Kinetic Chain Linkage: The Effect of Proximal Joint Stiffness on Distal Knee Control during Bilateral Landings, *JOSPT*
3. Lysander Jim, and Stuart McGill (accepted Nov 2018) Observations of thoracic neuromuscular oscillation subsequent to thoracic pathology, *Physical Medicine and Rehabilitation*,
4. Balkovec, C., Veldhuis, J., Baird, J., Brodland, W., McGill, S.M., (2018): Digital Tracking Algorithm Reveals the Influence of Structural Irregularities on Joint Movements in the Human Cervical Spine, *Clinical Biomechanics* 56:11-17.
5. Stuart McGill, and Brad Schoenfeld, (2017) Master Class- Choosing Exercises: An example with “the crunch”, *NSCA Personal Trainer Quarterly*.
6. Balkovec, C., Veldhuis, J., Baird, J., Brodland, W., McGill, S.M., (2017) A Videofluoroscopy-Based Tracking Algorithm for Quantifying the Time Course of Human Intervertebral Displacements. *Computer Methods in Biomechanics and Biomedical Engineering*. Mar 15:1-9. doi: 10.1080/10255842.2017.1302435.

7. Lee B and **McGill SM**. (2016) The Effect of Core Training on Distal Limb Performance During Ballistic Maneuvers. *J Sport Sci.*, <http://dx.doi.org/10.1080/02640414.2016.1236207>
8. Lee B and **McGill SM**. (2016) The effect of short term isometric training on core/torso stiffness. *J Sport Sci.* <http://dx.doi.org/10.1080/02640414.2016.1235791>
9. Balkovec, C., Vernengo, J., Stevenson, P., McGill, S.M., (2016) Evaluation of an injectable hydrogel and PMMA in restoring mechanics to compressively fractured spine motion segments, *The Spine Journal*. 16(11) 1404–1412.
10. Balkovec, C., Vernengo, J., McGill, S.M., (2016) Disc height loss and restoration via injectable hydrogel influences adjacent segment mechanics in-vitro *Clinical Biomechanics*, 36:1-7.
11. A Bateman, C Balkovec, M Akens, A Chan, W Oakden, R Harrison, A Yee, S McGill, (2016) Closure of the annulus fibrosus using a novel suture application device – in vivo porcine and ex-vivo biomechanical evaluation, *The SPINE Journal*. 16:889-895.
12. Giangregorio LM, Ashe MC, Shipp K, Cheung AM, Heinonen A, Papaioannou A, McGill S, Laprade J, Jain R, Leller K, MacIntyre N, Wark J. (2016) Intensity is a subjective construct", *Osteoporosis International*. *Osteoporos. Int.*, 27:2391–2392. DOI 10.1007/s00198-016-3507-9
13. Frost DM, Beach TAC, Crosby I, McGill SM. (2016) The cost and distribution of firefighter injuries in a large Canadian fire department, *WORK: A Journal of Prevention, Assessment & Rehabilitation*.55(3),497-504.
14. Cannon, J., Emond, D., McGill, S.M., (2016) Evidence on the ability of a pneumatic decompression belt to restore spinal height following an acute bout of exercise. *Journal of Manipulative and Physiological Therapeutics*, 39(4):304-310.
15. Santana, J.C., Brown, L., McGill, S.M., (2015) The Anterior and Posterior Serape: The rotational core. *Strength and Conditioning Journal*.37(5):8-13.
16. Frost DM, Beach TAC, Campbell TL, Callaghan JP, **McGill SM**.(2015) An appraisal of the Functional Movement Screen grading criteria – Is the composite score sensitive to risky movement behavior? *Phys Ther Sport* 2015 Nov 17;16(4):324-30. Epub 2015 Feb 17.
17. Frost DM, Beach TAC, Callaghan JP, **McGill SM**. (2015) Exercise-based performance enhancement and injury prevention for firefighters: Contrasting the fitness- and

movement-related adaptations to two training methodologies. *J Strength Cond Res* 2015 Sep;29(9):2441-59.

18. Frost DM, Beach TAC, **McGill SM**, Callaghan JP. (2015) A proposed method to detect kinematic differences between and within individuals. *J. Emg. Kinesiol.* Volume 25(3): 479–487.
19. Kushner A., M., Brent, J. L., Schoenfeld B., Hugentobler, J., Lloyd, R. S., Vermeil, A., Chu, D., Harbin, J., **McGill, S. M.**, Myer, G. D., (2015) The Back Squat Part 2: Targeted Training Techniques to Correct Functional Deficits and Technical Factors that Limit Performance, *J. Strength and Condit. Res.* 37(2):13-60.
20. **McGill SM**, Frost DM, Finlay T, et al. (2015) Can fitness and movement quality prevent back injury in elite task force police officers? A 5 year longitudinal study, *Ergonomics* 2015 Oct 8;58(10):1682-9. Epub 2015 May 8. Winner: **Liberty Mutual award for top paper in 2015.**
21. Balkovec C, Adams M, Dolan P, **McGill SM.** (2015) Annulus fibrosus can strip hyaline cartilage endplate from subchondral bone: a study of the intervertebral disc in tension. *Global Spine J* 2015 Oct 25;5(5):360-5. Epub 2015 Feb 25. **Won the top paper of the year for 2015 in the Global Spine Journal.**
22. Frost DM, Crosby I, **McGill SM** (2015). Firefighter injuries are not just a fireground problem. *WORK.* 09/2015; DOI:10.3233/WOR-152111
23. Vera-Garcia, F., Ruiz-Pérez, I., Barbado, D., Juan-Recio, C., **McGill, S.M.**, (2014) Trunk and shoulder EMG and lumbar kinematics of medicine-ball side throw and side catch and throw. *European J. Human Movement*, **33**:93-109
24. **McGill SM**, Cannon, J., Andersen J (2014). Muscle activity and spine load during pulling exercises: Influence of stable and labile contact surfaces and technique coaching. *J.EMG.Kines.* DOI 10.1016/j.jelekin.2014.06.002 24(5): 652-665
25. Sidorkewicz, N., & McGill, S. M. (2014). Documenting female spine motion during coitus with a commentary on the implications for the low back pain patient. *European Spine Journal*, 1-8.
26. Frost DM, Beach TAL, Callaghan J, **McGill SM.** (2015) A proposed method to detect kinematic differences between and within individuals. *J EMG. Kin.* 03/2015; 25(3). DOI:10.1016/j.jelekin.2015.02.012.

27. **McGill, SM**, Cambridge, E., Anderson, J., (2015). A six week trial of hula hooping using a weighted hoop: Affects on skinfold, girths, weight and torso muscle endurance. *J. Strength Cond. Res.* 29(5):1279–1284.
28. Lee B, **McGill SM**. (2014) Striking dynamics and kinetic properties of boxing and MMA gloves. *RAMA*. (Revista de Artes Marciales Asiaticas), 9(2): 106-115.
29. Frantzis E, Druelle P, Ross K, **McGill SM** (accepted Sept 2014). The accuracy of osteopathic adjustments of the lumbar spine: A Pilot Study. *Int. J Osteopathic Medicine* 18 (2015), pp. 33-39 DOI information: 10.1016/j.ijosm.2014.09.001
30. Balkovec C, Carstensen M, Leung A, **McGill SM** (2014). *A Preliminary Investigation into the Morphology of Trabecular Bone Damage Associated with Intervertebral Disc Herniation*. *J Spine Neurosurg* 3:6 doi:10.4172/2325-9701.1000162
31. Lee, B and **McGill, S.M.** (2015) The effect of long term isometric training on core/torso stiffness. *J. Strength Condit. Res.* 29 (6):1515-1526.
doi: [10.1519/JSC.0000000000000740](https://doi.org/10.1519/JSC.0000000000000740)
32. Frost DM, Beach TAL, Callaghan J, **McGill SM** (2015). FMS scores change with performer's knowledge of the grading criteria- Are general whole body movement screens capturing "dysfunction". *J Strength Cond Res* 2015 Nov;29(11):3037-44
33. Frost DM, Beach TAL, Callaghan J, **McGill SM** (2015). The influence of load and speed on individual's movement behaviour. *J Strength Cond Res* 2015 Sep;29(9):2417-25
34. McGill SM, Cannon J, Anderson J, (2014) Muscle activity and spine load during anterior chain whole body linkage exercises: The body saw, hanging leg raise and walkout from a pushup. *J. Sport Sci.* DOI 10.1080/026 40414.2014.946 437
35. Dejanovic A, Balkovec C, McGill SM (2015). Head posture influences low back muscle endurance tests in 11 year old children. *J Mot Behav* 2015 25;47(3):226-31. Epub 2014 Nov 25.
36. Sidorkewicz N and McGill SM (2014). Male spine motion during coitus: Implications for the low back pain patient. *SPINE* 39(20): 1633-1639.
37. Giangregorio LM, Ashe MC, Shipp K, Cheung AM, Heinonen A, Papaioannou A, McGill S, Laprade J, Jain R, Leller K, MacIntyre N, Wark J. “Is this exercise safe?” – Building consensus around responses to common questions about physical activity posed by people with osteoporosis. *J Bone Miner Res* 28 (Suppl). Available at: <http://www.asbmr.org/education/AbstractDetail?aid=ccf88652-3d98-4a0d-843fba44e6593d5f>

38. Giangregorio LM, McGill S, Wark JD, Laprade J, Heinonen A, Ashe MC, MacIntyre NJ, Cheung AM, Shipp K, Keller H, Jain R, Papaioannou A. Too Fit To Fracture: Outcomes of a Delphi consensus process on physical activity and exercise recommendations for adults with osteoporosis with or without vertebral fractures. *Osteoporosis International*, DOI 10.1007/s00198-014-2881-4, *Osteoporosis International: Volume 26, Issue 3 (2015)*, Page 891-910.
39. Myer GD, Kushner AM, Brent JL, Schoenfeld BJ, Hugentobler J, Lloyd RS, Vermeil A, Chu DA, Harbin J, McGill SM. The back squat: A proposed assessment of functional deficits and technical factors that limit performance. *Strength Cond.* 2014 Dec 1;36(6): 4-27.
40. Giangregorio L, MacIntyre N, Heinonen A, Cheung A, Wark J, **McGill SM**, Shipp K, Ashe M, Laprade J, Jain R, Keller H, Papaioannou A (2014). Too fit to fracture: A consensus on future research priorities in osteoporosis and exercise. *Osteoporosis International*. 25;1465-1472. DOI 10.1007/500198-014-2652-2
41. Casthanhero R, Duarte M, **McGill SM** (2014). Corrective sitting strategies: an examination of muscle activity and spine load. *J. EMG. Kinesiol.* 24(1): 114-119.
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F) Book Chapters

1. **McGill, S.M.** Analysis of the forces on the lumbar spine during activity in *Kinesiology: Mechanics and Pathomechanics of Human Motion* (ed. C. Oatis, third edition), Lippincott Williams and Wilkins, Philadelphia, 2016.

2. **McGill, S.M.** Mechanics and pathomechanics of muscles acting on the lumbar spine, in *Kinesiology: Mechanics and Pathomechanics of Human Motion* (ed. C. Oatis, third edition), Lippincott Williams and Wilkins, Philadelphia, 2016.
3. **McGill, S.M.** and Gray J. Weight lifting for junior athletes in *Functional Training Handbook* (ed Craig Liebenson). Wolters Kluwer Philadelphia 2014.
4. Ikeda, D. and **McGill, S.M.** Assessing joint stability from eigen values obtained from multi-channel EMG- A spine example, In: *Applications, Challenges and Advancements in Electromyography Signal Processing* (Ed G. Naik). 2013
5. Hodges, P., **McGill, S.M.** and others. Integrated clinical approach to motor control interventions in low back and pelvic pain, in *Spinal Control: The rehabilitation of back pain.* (ed P. Hodges, J. Cholewicki and Ja. van Dieen). Churchill Livingstone, London. 2013.
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8. **McGill, S.M.** What I have learned from the great athletes, *Procedia IUTAM*, Elsevier www.elsevier.com/locate/procedia, 2012
9. Geraci, M. and **McGill, S.M.**, Assessment and corrective exercise for back disorders: Looking throughout the linkage, in *Evidence-Based Interventional Spine Care* (ed. M. DePalma, Demos Medical Publishing, N.Y.) 2011
10. **McGill, S.M.** Analysis of the forces on the lumbar spine during activity in *Kinesiology: Mechanics and Pathomechanics of Human Motion* (ed. C. Oatis, second edition), Lippincott Williams and Wilkins, Philadelphia, 2008.
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13. Vera Garcia, F.J., Lison, J.F., **McGill, S.M.** Biomechanica del raquis. Efecto de la co-activación abdominal sobre el control de la estabilidad raquídea, In: Biomechanica aplicada a la actividad física y al deporte. (eds. Soriano, P.P. and Belloch, S.L.) Delegación de Cultura, SPAIN, 2007.
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15. **McGill, S.M.** Spinal stability: Mechanism of injury and re-stabilization, in: Rehabilitation of the Spine - A Practitioners Manual - 2nd Edition (ed. C.L. Liebenson), Lippincott, Williams and Wilkins, Baltimore, 2006.
16. **McGill, S.M.** Medical Management: Back Belts. In: Occupational Ergonomics Handbook (second edition), CRC Press, 2006.
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21. **McGill, S.M.** Low back exercises: Prescription for the healthy back and when recovering from injury, in American College of Sports Medicine Resource Manual for Guidelines for Exercise Testing and Prescription, 4th Edition, Williams and Wilkins, Philadelphia (2001).
22. **McGill, S.M.** Should workers wear back belts? International Encyclopaedia of Ergonomics and Human Factors (ed. W. Karwowski), Taylor and Francis, 2001, pp. 1469-1471.
23. **McGill, S.M.** Guidelines to reduce the risk of low back injury in workers performing manual work, sitting, standing and walking tasks. International Encyclopaedia of Ergonomics and Human Factors (ed. W. Karwowski), Taylor and Francis, 2001, pp. 1754-1757.

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31. **McGill, S.M.**, and Norman, R.W. Low Back Biomechanics in Industry - The Prevention of Injury. (ed. M.D. Grabiner), in: Current Issues in Biomechanics. Human Kinetics Publishers, Champaign, Illinois, 1992.
32. **McGill, S.M.** Loads on the Spine and Associated Tissues. In Biomechanics of the Spine: Clinical and Surgical Perspectives (eds: V.K. Goel and J.N. Weinstein), CRC Press Inc., Boca Raton, 1989.

Graduate Student Supervision (GS - Graduating Status)

a) **As Supervisor: M.Sc.**

1. **J. Cannon**, "In Progress". MSc

2. **B. Lee**, MSc 2014, “Spine stiffness: Influences from short and long term training. GS Entrepreneur in Velocity Center Startup Company.
3. **N. Sidorkevicz**, MSc 2013, Movements and muscle activity levels during coitus. GS PhD Student.
4. **D. Ikeda**, MSc. 2011. Quantification of spine stability: Assessing the role of muscles and their links to eigen values and stability. GS Lab Scientist and Technician, Dalhousie University.
5. **S. Freeman**, MSc.” Can altering hip joint fluid volume and intra-capsular pressure influence muscle activation patterns?” MSc, GS Lab Clinician
6. **R. Patel**, 2011. “Performance of a two-foot vertical jump: what is more important hip or knee dominance”, MSc. GS Lab Technician and Scientist.
7. **J. Yates**, MSc. 2009. Establishing the effect of vibration and postural constraint loading on the progression of intervertebral disc herniation, GS. Teaching Demonstrator. Department of Kinesiology.
8. **L. Marshall**, MSc. 2008. An Investigation of the Role of Dynamic Axial Torque and Twist on the Disc Herniation Mechanism. GS: Lab Technician.
9. **C. Tampier**, M.Sc. 2006. Progressive disc herniation: An investigation of the mechanism using histochemical and microscopic techniques, GS: Surgeon in Chile.
10. **S. Howarth**, MSc. 2006. Locating instability in the lumbar spine: Characterizing the eigenvector. GS: Ph.D. Candidate, University of Waterloo.
11. **K. Walker**, M.Sc. 2004. Mechanics of pushing and pulling tasks, GS: Ergonomist at GE.
12. **S. Wang**, M.Sc.2004. The links between ventilation mechanics, spine mechanics and stability. GS: Student at CMCC.
13. **N. Kavcic**, M.Sc. 2002. Determining the stabilizing role of the torso musculature during rehabilitation exercise, GS: Scientist, Spine Laboratory, U. of Waterloo.
14. **R. Pruess**, M.Sc. 2001. Testing and training the proprioception in the lumbar spine. GS: Ph.D. Candidate - Dept. of Physical Therapy, McGill University.
15. **J. Scannell**, M.Sc. 2001, Lumbar posture - should it be modified? A study of passive tissue strain and muscle activation patterns. GS: Ph.D. Candidate, University of Waterloo.
16. **J. Gunning**, M.Sc. 1999. Spinal injury: the role of prior loading history using a porcine trauma model. GS: Project Manager - Injury Reduction with Garment Workers’ Union.
17. **G. Lehman**, M.Sc. 1998. The influence of spinal manipulative therapy on lumbar spinal range of motion and associated trunk muscle EMG. GS: Scientist, UW-CMCC Research Clinic.
18. **L. Breerton**, M.Sc. 1998. Effects of physical fatigue and cognitive challenges on the potential for low back injury during low external load, end range of motion conditions. GS: Ergonomist, General Motors Diesel Division, London.

19. **J. Peach**, M.Sc. 1997. Objective measurement of the spine kinematics and muscle activity in low back patients and normals. GS: Ph.D. Candidate - Dept. of Mechanical Engineering, Univ. of Vermont.
20. **C. Axler**, M.Sc. 1995. Low back loads over a variety of abdominal exercises: Searching for the safest abdominal challenge. GS: Ergonomist - Occupational Health Clinics for Ontario Workers.
21. **J. Callaghan**, M.Sc., 1994, Compressive strength of a porcine vertebral fracture model exposed to physiologic pressures. GS: Ph.D. Candidate - U. Waterloo.
22. **C. Sutarno**, M.Sc., 1993, Objective measurement of the kinematics of the lumbar spine in normal and patient populations. GS: Ergonomist - ATT Global Information Systems, Atlanta.
23. **M. Mullender**, M.Sc., July 1991. The relationship between electromyography of trunk muscles and torque in the lumbar spine, in the Faculty of Human Movement Sciences, Free University, Amsterdam, Holland. GS: Ph.D. Candidate - Holland.
24. **L. Santaguida**, M.Sc., October, 1991. The Psoas Major Muscle: A three-dimensional anatomical and mechanical study with respect to the spine. GS: Research Director, Dept. of Physical Therapy, Wellesley Hospital, Toronto.
25. **J. Cholewicki**, M.Sc., August, 1990. Evaluation of the lumbar discs and ligaments during extremely heavy lifts via dynamic fluoroscopy. GS: Ph.D. Candidate - U. Waterloo.

As Supervisor: Ph.D.

1. **N. Sidorkewicz**, co-supervised, "In Progress", Ph.D.
2. **C. Balkovec**, Ph.D. 2016 Linking Spine Joint height to mechanics, function, and disability. GS: Head of Biomechanics, Julius Wolff Institute, Berlin
3. **E. Cambridge**, "In Progress", Ph.D.
4. **D. Frost**, Ph.D., 2013, Towards the establishment of a worker-centered framework to physically prepare firefighters: The evaluation of movement and the transfer of training. GS: Assistant Professor, Univ of Toronto.
5. **J. Flynn/Moreside**, Ph.D., 2010. The effect of limited hip mobility on the lumbar spine in a young adult population. GS: Visiting Scientist Spain then Assistant Professor, Dalhousie University.
6. **S. Brown**, Ph.D., 2008. Examining the Neuromuscular and Mechanical Characteristics of the Abdominal Musculature and Connective Tissues: Implications for Stiffening the Lumbar Spine. GS: Pst Doc, then Assistant Professor, U. Guelph.
7. **J. Scannell**, Ph.D., 2007. In Vitro and In Vivo Biomechanical Investigation of the Clinical Practice of Disc Prolapse Prevention and Rehabilitation. GS: own business

8. **D. Bereznick**, Ph.D., 2005. Lumbar Manipulation: Quantification and Modification of the External Kinetics Affecting the Presence and Site of Cavitation. GS: Professor - CMCC
9. **K. Ross**, Ph.D., 2003. Spinal Manipulative Therapy Techniques: Evaluating the Mechanistic Assumptions. GS: Professor - CMCC
10. **S. Grenier**, Ph.D., 2002. Stabilization strategies of the lumbar spine invivo. GS: Assistant Professor, Laurentian University.
11. **J. Callaghan**, Ph.D., January 1999. Low back injury from repeated and prolonged loads. GS: Assistant Professor, School of Human Biology, University of Guelph.
12. **V. Yingling**, Ph.D., June 1997. Shear loading of the lumbar spine: modulators of motion segment tolerance and the resulting injuries. GS: Post doctoral Fellow, George Washington University School of Medicine.
13. **J. Cholewicki**, Ph.D., October 1993, Mechanical Stability of the in vivo lumbar spine. GS: Assistant Professor, Yale University School of Medicine.