

Kelly A. Larkin Kaiser, PhD, CAT(c)

AIHS Clinician Scientist
Postdoctoral Research Fellow & Sessional Instructor
Human Performance Laboratory
University of Calgary
Mentor: Dr. Walter Herzog
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Nationality: Canadian

ABSENCES:

September 19, 2013-September 2, 2014: Maternity Leave

EDUCATION

2012-present Postdoctoral Research Fellowship

University of Calgary
Mentor: Walter Herzog, Ph.D.
Project: Structural and Functional Muscle Changes are Associated with Clinical Dysfunction in Children with Spastic Cerebral Palsy

2013-present Sessional Instructor

University of Calgary
Faculty of Kinesiology

2012 PhD in Applied Physiology and Kinesiology

University of Florida
Advisor: Paul A. Borsa, Ph.D. ATC
Dissertation Title: Effect of Near-Infrared Light Therapy on Time to Task Failure and Motor Output of Young and Older Adults

2008 Master of Science in Human Performance

University of Florida
Advisor: Ronald Siders, Ph.D.

2006 CATA board of Certification

2006 Bachelor of Science Honours-Human Kinetics

University of Guelph

2006 Diploma in Sports Injury Management-Athletic Therapy

Sheridan College

SCHOLARLY ACTIVITY

Major Areas of Recent Research (2006-date):

- **Principle Investigator:** Research Project: Functional Sarcomere Length change throughout Hip Range of Motion. Department of Kinesiology, Human Performance Lab, University of Calgary. (September 2014-Present)
- **Principle Investigator:** Research Project: Structural and Functional Muscle Changes are Associated with Clinical Dysfunction in Children with Spastic Cerebral Palsy. Department of Kinesiology, Human Performance Lab, University of Calgary. (September 2012-Present)
- **Principle Investigator:** Research Project: Sarcomerogenesis following Electrical Stimulation in a Rabbit Model. Department of Kinesiology, Human Performance Lab, University of Calgary. (September 2012-Present)
- **Principle Investigator:** Research Project: Age-Associated Modulation of Motor Control Following Treatment with Phototherapy. Department of Applied Physiology and Kinesiology, Sports Medicine Research Lab (January 2012-June 2012)
- **Research Assistant and Lab Co-ordinator:** Sports Medicine Research Lab, Dr. Paul Borsa.
- **Principle Investigator:** Research Project: Dose-response Effects of Phototherapy on Motor Control and Muscle Fatigue. Department of Applied Physiology and Kinesiology, Sports Medicine Research Lab (June 2011-October 2011)
- **Principle Investigator:** Research Project: Ergogenic Effects of Phototherapy on Muscle Function. Department of Applied Physiology and Kinesiology, Sports Medicine Research Lab (January 2011-June 2011)
- **Study Co-ordinator and Research Assistant:** Dr. Paul Borsa, Ph.D. Department of Applied Physiology and Kinesiology. Effects of R-water® on Skeletal Muscle Dysfunction and Recovery Following Eccentric Exercise.
- **Study Co-ordinator and Research Assistant:** Dr. Thomas Buford, Ph.D. Department of Medicine. Graded Vascular Occlusion and KAATSU exercise on Skeletal Muscle Regenerative Signalling.
- **Research Assistant:** Dr. Steven George, Ph.D., PT. Sports Medicine Research Laboratory, Department of Physical Therapy. Biopsychosocial Effects on Shoulder Pain (February 2009-August 2010)
- **Principle Investigator:** Research Project: Dose-response Effects of Phototherapy on the Microcirculation of the Forearm. (January 2009-June 2010)
- **Research Assistant:** Jeffrey J. Parr, MS, ATC, LAT, H/FI. Dose Response effect of Phototherapy for treating muscle pain and dysfunction (January 2008- December 2009)
- **Internship:** Dr. Paul Borsa, Ph.D.,ATC. Sports Medicine Research Laboratory, University of Florida (January 2008- April 2009)
- **Research Assistant:** Jeffrey T. Wight's, Ph.D. Using rotational resistance measures to thoroughly assess shoulder flexibility in baseball pitchers: Implications for throwing arm adaptations and injuries (September 2006- April 2007)

PUBLICATIONS

Refereed Journals

- **Larkin-Kaiser, K.A.**, Borsa P.A., Parr J.J., George S.Z. Range of Motion as a Predictor of Clinical Shoulder Pain During Recovery from Delayed-Onset Muscle Soreness. 2015 Mar; 50(3):289-94 *Journal of Athletic Training*. DOI: 10.4085/1062-6050-49.5.05
- **Larkin-Kaiser K.A.**, Christou E.A., Tillman, M.D, George, S.Z., Borsa P.A. Near-infrared Light Therapy to Attenuate Strength Loss after Strenuous Resistance Exercise. 2015 Jan; 50(1): 45-50. *Journal of Athletic Training*. DOI: 10.4085/1062-6050-49.3.82
- Borsa, P.A., **Larkin-Kaiser, K.A.** Daily Controlled Consumption of an Electrokinetically Modified Water Alters the Fatigue Response as a Result of Strenuous Resistance Exercise. Vol. 2014, Article ID 673530, 7 pages, 2014. *Physiology Journal*. DOI: 10.1155/2014/673530
- Nguyen, L.M.D., Malamo, A.G., **Larkin-Kaiser, K.A.**, Borsa, P.A., Adhietty, P.J. Effect of Near-Infrared Light Therapy on Mitochondrial Signaling in C₂C₁₂ Muscle Cells. *Mitochondrion* 2014 Jan; 14 (1):42-8. DOI:10.1016/j.mito.2013.11.001
- Borsa, P.A., **Larkin-Kaiser, K.A.**, Martin, J.S. Oral Consumption of Electrokinetically Modified Water Attenuates Muscle Damage and Improves Post-Exercise Recovery. *Journal of Applied Physiology*. DOI: 10.1152/jappphysiol.00083.2013
- Parr, JJ, Borsa, PA, Fillingim, RB, **Kaiser, KA**, Tillman, MD, Manini, TM, Gregory, CM, & George, SZ. Psychological Influences Predict Recovery Following Exercise Induced Shoulder Pain. *International Journal of Sports Medicine*. 2014 Mar;35(3):232-7. DOI: 10.1055/s-0033-1345179
- Borsa, P.A., **Larkin, K.A.**, Does Phototherapy Enhance Skeletal Muscle Contractile Function and Post-exercise Recovery? A Systematic Review. *Journal of Athletic Training*.2013;48(1)57-67. DOI: 10.4085/1062-6050-48.1.12
- **Larkin K.A.**, MacNeil R.G., Manini T.M., Buford, T.W. Blood Flow Restriction Enhances Angiogenic Gene Expression after Muscle Contractions. *Medicine & Science in Sports and Exercise*. 2012 Nov;44(11):2077-83. DOI: 10.1249/MSS.0b013e3182625928
- **Larkin, K.A.**, Martin, J.S.,Zeanah, E., Braith, R., & Borsa, P.A. Limb Blood Flow After Class 4 Laser Therapy. *Journal of Athletic Training*. Volume 47, issue 2, 178-183. April 2012. PMC3418129
- Knaggs, J., **Larkin KA**, Manini T, Metabolic Cost of Daily Activities and Effect of Mobility Impairment in Older Adults. (Manuscript in Press) *Journal of the American Geriatrics Society*. Volume 59, Issue 11, November 2011. DOI: 10.1111/j.1532-5415.2011.03655.x.
- Parr, J.J., **Larkin, K.A.** & Borsa, P.A. Effect of Class IV Laser Therapy on Exercise-Induced Muscle Injury in Humans. *Athletic Training & Sports Health Care*. Volume 2, Number 6, November/December 2010. DOI: 10.3928/19425864-20100630-04

Submitted/In Review

- **Larkin-Kaiser, K.A.**, Crooks, S.M., Herzog W. Rapid Serial Sarcomere Loss Following Tibial Nerve Stimulation in *Triceps Surae* Musculature of New Zealand White Rabbits. (Manuscript in Review)
- **Larkin-Kaiser, K.A.**, Howard J, Leonard TR, Joumaa V, Logan K, Orlik B, El-Hawary R, Herzog W. Structural and Functional Changes are Associated with Severity of Hip Displacement in Children with Cerebral Palsy. (Manuscript in Review)
- Layne, A.S., **Larkin-Kaiser, K.A.**, MacNeil, G., Dirain, M., Sandesara B., Manini, T.M., Buford, T.W. Effects of Blood Flow Restriction on Biomarkers of Myogenesis Among Healthy Young Adults. (Manuscript in Review)
- **Larkin-Kaiser, K.A.**, Baweja, H.S, Moore, M.A, Chen Y.T, Christou, E.A., Borsa, P.A. Near-Infrared Light Therapy Delays the Onset of Time to Task Failure. (Manuscript in Review)
- **Larkin-Kaiser, K.A.**, Borsa, P.A. Does Phototherapy Enhance Local Blood Circulation in Soft Tissue? A Systematic Review. (Manuscript in Review)
- Parr, JJ, Borsa, PA, Fillingim, RB, **Larkin-Kaiser, KA**, Tillman, MD, Manini, TM, Gregory, CM, & George, SZ. Predicting Recovery Following an Induced Injury Model of Pain. (Manuscript in Review)

In Preparation

- Engel M, **Larkin-Kaiser K.A.**, Herzog W.
- **Larkin-Kaiser, K.A.**, Leonard, T, Herzog W. Passive stresses in CP

Published Abstracts and Conference Presentations

- Leonard TR, **Kaiser KA**, Herzog J, Logan K, Orlik B, El-Hawary R, Howard J, Herzog W. Passive Forces in Single Myofibrils from Children with Cerebral Palsy. *World Congress of Biomechanics, Boston, USA, 2014*
- **Larkin K.A**, Baweja H.S., Moore M.A., Borsa P.A., Christou E.A., Phototherapy prolongs time to task failure in older adults. *Society for Neuroscience 2012.*
- Baweja H.S., **Larkin K.A**, Christou E.A., Training Older Adults with Low-gain Visual Feedback Facilitates Motor Learning. *Society for Neuroscience 2012.*
- Christou EA, Fox EJ, Onushko T, Baweja HS, Kwon MH, Chen YT, Kim C, **Larkin K**. Training Strategies to Enhance Motor Learning in Older Adults. *KAHPERD International Sport Science Congress, Mokpo, Korea, 2012*
- Christou EA, Baweja HS, Fox EJ, Onushko T, Kwon MH, Chen YT, Kim C, **Larkin K**. Aging, visual feedback and the control of fine motor tasks. *Science of Human Movement and Sports Psychology. Seoul national University, Seoul , Korea 2012*

- Christou E.A., Baweja H.S., Kwon M.H., Chen Y.T., Kim C., **Larkin K.A.**, Onushko T.L., Fox E.J. Simplified Training interventions Enhance Motor Learning in Older Adults. *Pepper Claude Aging Presentations 2012.*
- **Larkin K.A.**, Christou E.A., Moore M.A., Tillman M.D., George S.Z., Borsa P.A. Near-infrared Light Therapy Delays the Onset of Task Failure. *7th Annual Neuromuscular Plasticity Symposium, 2012.*
- Baweja H.S., **Larkin K.A.**, Tanner EP, Moore MA, & Christou EA. Two-weeks of low-intensity training lowers ankle movement variability and error in older adults to the level of young adults. *7th Annual Neuromuscular Plasticity Symposium, 2012.*
- **Larkin K.A.**, Borsa P.A. Consumption of a Novel, Carbohydrate-free Recovery Beverage Attenuates Strength Loss after High Intensity Resistance Exercise. *American College of Sports Medicine 2012*
- Borsa P.A. **Larkin K.A.** Consumption of a Novel, Carbohydrate-free Recovery Beverage Reduces Muscle Damage and Improves Recovery Post-Exercise. *American College of Sports Medicine 2012*
- **Larkin K.A.**, MacNeil R.G., Clough L., Sandesara B., Manini T.M., Buford T.W. Blood Flow Restriction Increases Angiogenic Gene Expression in Skeletal Muscle following Acute Resistance Exercise. *American College of Sports Medicine 2012*
- Nguyen L.M-D., **Larkin K.A.**, Borsa P.A., Adihetty P.J. Effect of Photo-Irradiation on Mitochondrially-Associated Signaling in C2C12 Muscle Cells. *Experimental Biology 2012*
- Wight J.T., Grover G.B., **Larkin K.A.**, Livingston B.P., Tillman M.D. The Throwing Shoulder's Resistance Zone is Greater for External Rotation than Internal Rotation. *South Eastern American College of Sports Medicine 2012*
- **Larkin K.A.**, Borsa PA, Parr JJ, George SZ. Range of Motion Predicts Clinical Shoulder Pain During Recovery. *National Athletic Trainer' Association Annual Meeting 2011.* New Orleans, LA.
- **Larkin K.A.**, Martin J.S., Zeanah E., Parr J.J., Braith R.W., & Borsa P.A. Dose-response Effects of Phototherapy on Microcirculation in the Forearm. *National Athletic Trainers' Association Annual Meeting.* 2010. Philadelphia, PA.
- Kindler L.L., Valencia C, Parr J.J., **Larkin K.A.**, Borsa P.A. Sibille K, Fillingim R.B., and George S.Z. Reliability of Repeated Diffuse Noxious Inhibitory Control Trials. *World Congress of Pain.* Montreal, Que, Canada. June 2010.
- Valencia C, Parr J.J., Kindler L.L., **Larkin K.A.**, Borsa P.A., Fillingim R.B. and George S.Z. Central Pain Inhibitory Mechanisms do not differ between preoperative patients with shoulder pain and health controls. *World Congress of Pain.* Montreal, Que, Canada. June 2010.
- **Larkin K.A.** Modulatory Effects of Laser Therapy on Circulation. *Research Symposium.* University of Florida. April 11, 2009.

Oral Presentations

- **Larkin-Kaiser K.A.** Larger Isoforms of Titin are Associated with Increased Sarcomere Lengths and Severity of Hip Displacement in Cerebral Palsy. *International Society of Biomechanics. Glasgow, Scotland, 2015.*
- **Larkin-Kaiser K.A.** Increased Sarcomere Length is Associated with Increased Severity of Hip Displacement in Children with Cerebral Palsy. *World Congress of Biomechanics. Boston, USA, 2014.*
- **Larkin K.A.** Near-infrared Light Therapy Attenuates Strength Loss following Eccentric Exercise of the Biceps Brachii. Current trends in modality research. *National Athletic Trainers Association Annual Meeting. 2012. St. Louis, Missouri.*
- **Larkin K.A.** Near-infrared Light Therapy Delays the Onset of Skeletal Muscle Fatigue. *American Society for Biomechanics 2012. Gainesville, Florida.*

INVITED PROFESSIONAL PRESENTATIONS

- **Larkin K.A.** Strategies for Gaining Weight. University of Florida. Department of Applied Physiology and Kinesiology. April 2011
- **Larkin K.A.** Algometry for the Assessment of Musculoskeletal Pain. University of Florida. Department of Applied Physiology and Kinesiology. January 2011
- **Larkin K.A.** Introduction to Anatomy. University of Florida. Department of Applied Physiology and Kinesiology. February 2010
- **Larkin K.A.** The Peripheral Nervous System: Anatomy and Function. University of Florida. Department of Applied Physiology and Kinesiology. March 2009

TEACHING, & MENTORSHIP

TEACHING EXPERIENCE:

Undergraduate Courses

KNES 371- Scientific Basis of Prevention and Care of Athletic Injuries (Winter 2015)

University of Calgary, Department of Kinesiology

Role: Laboratory Instructor. Prepared and delivered weekly laboratory sessions on musculoskeletal assessment of athletic injuries.

Enrollment: 16 students

KNES 259-Human Anatomy and Physiology I (Fall 2014)

University of Calgary, Department of Kinesiology

Role: Anatomy Instructor. Prepared and delivered weekly Anatomy lectures.

Enrollment: 200 Students

KNES 260-Human Anatomy and Physiology II (Winter 2015)

University of Calgary, Department of Kinesiology
Role: Anatomy Instructor. Prepared and delivered weekly Anatomy lectures.
Enrollment: 150 Students

KNES 460-Human Anatomy Practicum (Spring 2014, Summer 2014)
University of Calgary, Department of Kinesiology
Role: Anatomy Instructor. Instructed and lead a human anatomy cadaver dissection practicum with senior level Kinesiology students.
Enrollment: 2-5 Students/semester

KNES 259-Human Anatomy and Physiology I (Spring 2013, Spring 2014)
University of Calgary, Department of Kinesiology
Role: Course Coordinator and Anatomy Instructor. Prepared and delivered weekly Anatomy lectures. Organized and coordinated all teaching assistants and exam materials for the undergraduate students.
Enrollment: Approximately 70 students

KNES 260-Human Anatomy and Physiology II (Summer 2013, Summer 2014)
University of Calgary, Department of Kinesiology
Role: Course Coordinator and Anatomy Instructor. Prepared and delivered weekly Anatomy lectures. Organized and coordinated all teaching assistants and exam materials for the undergraduate students.
Enrollment: Approximately 50 students

APK 4125-Physical Fitness Assessment and Exercise Prescription (Spring 2011)
University of Florida, Department of Applied Physiology and Kinesiology
Role: Prepared daily lectures for undergraduate Physical Fitness Assessment and Exercise Prescription.
Enrollment: Approximately 90 students

APK 2100-Applied Human Anatomy (Fall 2007-Spring 2010)
University of Florida, Department of Applied Physiology and Kinesiology
Role: Anatomy Laboratory Coordinator. Organized and Coordinated all Teaching assistants and Lecture material for the undergraduate anatomy course.
Enrollment: 10 Teaching Assistants and approximately 900 students

APK 2100-Applied Human Anatomy (Fall 2006-Summer 2012)
University of Florida, Department of Applied Physiology and Kinesiology
Role: Anatomy Laboratory Instructor. Prepared and delivered weekly lectures for the undergraduate anatomy course.
Enrollment: Approximately 90 students

APK 2105-Human Physiology (Spring 2007)
University of Florida, Department of Applied Physiology and Kinesiology
Role: Physiology Laboratory Instructor. Prepared and delivered weekly lectures for the undergraduate physiology course.
Enrollment: Approximately 90 students

Graduate Courses

APK 6317-Manual Therapy Techniques (Spring 2007)
University of Florida, Department of Applied Physiology and Kinesiology

Role: Laboratory Instructor. Prepared and delivered weekly laboratory tutorials on manual therapy techniques

Post Graduate Courses

Academic Rounds, University of Calgary, School of Medicine-Basic Science Half Day (October 8, 2015)
- Formulated and presented lecture material to 1st and 2nd year orthopedic surgical residents on 1) Bone: Structure, function, physiology and metabolism, and 2) Bone fractures

STUDENT MENTORSHIP:

Undergraduate Students

Tristan McSwiney (*University of Alberta*)
Vivian Wang (*University of Calgary*)
Andy Hogan (*University of Florida*)
Pamela McCurdy (*University of Florida*)
Lauren Vaught (*University of Florida*)
Chelsea Wright (*University of Florida*)
Victor Garbolosa (*University of Florida*)
Adam Oxios (*University of Florida*)
Natalie Martinez (*University of Florida*)
Lauren Hardin (*University of Florida*)
Molly Moore (*University of Florida*)
Kyle Terborg (*University of Florida*)
Vivian Wang (*University of Calgary-Honours Thesis*)
Jackie Stevens (*University of Calgary*)

Graduate Students

William Hedderson (*University of Florida*)

Reviewer-Journals

Journal of Athletic Training
Journal of Gerontology

HONORS AND AWARDS:

- AIHS Clinician Scientist Fellowship July 1, 2015-Present
- David Winter Young Investigator Award- International Society of Biomechanics-July 16, 2015
- Graduate Teaching Assistantship August 2011-August 2012
- Research Assistantship August 2010-August 2011
- International Student Award of Outstanding Academic Achievement November 2008
- Grinter Fellowship October 2008
- Charles LePradd Fellowship October 2008
- Teaching Assistantship, University of Florida, August 2006-August 2010
- Sheridan Scholar award June 2006
- Recipient, Robert Firth Memorial Scholarship May 2006
- Sheridan Silver Medalist Award June 2006
- University of Guelph Dean's list September 2002-June 2006

PROFESSIONAL ATHLETIC THERAPY EXPERIENCE:

- **Sheridan College Athletic Therapy Clinic** (September 2004- June 2006)
- **University of Florida.** Internship at: Infirmary Physiotherapy Clinic, Shands Orthopaedic Institute and Athletic Training and Sports Medicine Clinic (February 2006)
- **University of Miami.** Internship in Athletic Training Clinic (January 2006)
- **Mind to Muscle Athletic Therapy Clinic** (September 2005- December 2005)
- **Appleby College.** Student Athletic Therapist for Field Hockey, Ice Hockey, Soccer and Rugby teams (September 2004-June 2005)
- **Canada Cup International Wrestling Tournament.** Assistant Athletic Therapist for Tournament and Olympic trials (July 2003, July 2004, July 2005)
- **Canada Cup International Wrestling Camp.** Assistant Athletic Therapist (July 2003, July 2004, July 2005)
- **University of Guelph.** Student Athletic Therapist for Women's Rugby and the Men's and Women's Wrestling team (September 2002-June 2004)

PROFESSIONAL SOCIETIES:

- Canadian Athletic Therapists Association 2003-Present. Membership #2-3588
- Alberta Athletic Therapists Association September 2012-Present
- International Voting Chapter of Canadian Athletic Therapists Association 2008-2012
- Ontario Athletic Therapists Association 2003-2008.
- Red Cross 2002-Present. First Responder Certified.
- Canadian Ski Coaches Federation 2001-Present

References:

Walter Herzog, PhD
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Paul A. Borsa, PhD, ATC
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Evangelos A. Christou, PhD
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