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Newsletter – Issue 2: January 2018

Editorial by Diana De Carvalho

It is hard to believe 2017 is over! I am very excited to announce our first collection of CARL publications: three manuscripts have been accepted for publication in *BMC Complementary and Alternative Medicine*, *Journal of Chiropractic Education* and *Chiropractic & Manual Therapies* respectively. Congratulations!

It has now been eight months since our first residential and along with celebrating our early successes I think it is also important to reflect on our experiences so far. Balancing some combination of clinical duties, graduate studies, academic appointments and life is always a delicate act. I think, on some level, we all appreciated that adding an extra log to the proverbial fire would be a challenge. While adjusting to this new workload and intensity hasn't always been comfortable, we do recognize that opportunities such as these help us grow and become stronger. I am sure this must have been part of our Mentors' plan.

All of us Fellows committed to CARL with the goal of pushing the existing boundaries of chiropractic research and leadership and strengthening our personal skills and performance. I think our first year has shown we are on the right path. High intensity has resulted in us really pulling together as a group and developing strong bonds in a relatively short period of time. We are learning to work more efficiently as we successfully integrate CARL projects into our existing workloads. Most importantly we have been learning from each other, broadening our skills in new research areas and developing creative skills for working on projects remotely as a team.

Speaking of teamwork, CARL Fellows work around the clock. Literally. Like a relay team, our Australasian contingent pick up work as those in Europe and North America turn down. While connecting with teammates in several time zones is challenging (someone always ends up taking the midnight meeting shift) it's also extremely motivating. Projects are constantly moving forward which helps make it easier to stay focused and productive. This momentum has been happily spilling over to remove inertia from personal work as well. The saying, 'if you want something done quickly give it to someone busy', is quite true.

It is exciting to watch this high performance productivity take off. And what a start! With three papers already accepted, several more recently submitted and lots of fantastic projects on the go, CARL is well on its

HIGHLIGHTS

- CARL Fellow, **Mike Swain**, welcomed a son to his family, Gabriel Michael Swain! Gabe was born 14 December 2017.
- CARL has been successful in securing a **CIHR Knowledge and Dissemination Grant** to support the 2nd residential in Edmonton this April 2018!
- **Three** accepted CARL publications:
 - Moore & Adams, *BMC Complementary and Alternative Medicine*
 - de Luca, Swain, Fernandez & Kawchuk, *Journal of Chiropractic Education*
 - All CARL Fellows and Mentors, *Chiropractic & Manual Therapies*
- **Four** CARL publications have been submitted for publication and are currently in review.
- CARL projects were presented at **four** scientific conferences:
 - International Back and Neck Pain Research Forum, September 2017, Oslo, Norway
 - CA-COCA National Conference, October 2017, Melbourne, Australia
 - CAA National Conference, October 2017, Canberra, Australia
 - Musculoskeletal, Bone & Joint Health Alliance, October 2017, Sydney, Australia

way to fulfilling its goal of moving the international chiropractic research and leadership scene forward. We are all so excited and proud of CARL and look forward to our second residential, hosted by the University of Alberta in Edmonton from April 23-26, followed immediately by Research Day at the Canadian Chiropractic Association's 2018 National Convention (April 27-29). Look for highlights of these events, and our continued progress, in the next issue of the CARL Newsletter.

-Diana

Mentor's Note by Jon Adams, Greg Kawchuk, and Jan Hartvigsen

Breakfast with CARL

Greetings from the CARL principals! It's unbelievable, yet at the same time completely fathomable, that our last residential occurred 8 months ago in Odense, Denmark. Since then, the three of us (Jon Adams, Jan Hartvigsen and Greg Kawchuk) have been busy interacting with the fellows through email, Skype and sometimes, even in-person. As always, we have been promoting the program around the globe throughout the year while the planning of 2018's residential in Canada is in full gear – and not to mention carrying on with our own research careers. Despite all of those activities, not a single day has passed when we think the program is a burden. Far from it. In fact, CARL is now showing just how much potential it has to not only help early career researchers increase their academic output, but to address the leadership gaps in chiropractic that we see in our various travels. As the world moves more and more to non-pharmacological and non-surgical approaches for health care, the need for researchers, academics, administrators, team-leads and executives related to high-value musculoskeletal care is expanding globally. While some may consider this hyperbole, the discussion wherever we go is how we can expand the CARL model for to meet these needs in specific countries, schools and training programs.

A highlight of the year was when Jan Hartvigsen had the opportunity to present and promote CARL with the four Australian Fellows at both the Chiropractic Australia and the Chiropractic Association of Australia conventions that were held just one week apart in October. Michael Swain, Matthew Fernandez, Katie de Luca, and Craig Moore presented the program and the many projects, and Jan made a plea for further funding. It became clear that we're on to something good here, and many early career researchers who are not part of CARL have inquired about the possibility of becoming involved and we are discussing possibilities for expanding CARL with new future cohorts.

Our next residential in Edmonton Alberta (April 23 – 26, 2017) where our 13 CARL fellows will descend on the University of Alberta for 4 days of intense training, collaboration and discussions. In Edmonton, we will offer a new feature – **“Breakfast with CARL”** – a keynote lecture that will not only inspire the CARL fellows, but possibly you as well! Each morning of the Edmonton residential, a select number of invited guests and sponsors can join us to hear a local leader provide mentorship in a diverse and challenging array of topics. **“Breakfast with CARL”** is a unique opportunity to see first-hand how CARL works from the inside. A preliminary program will be available soon.

If you are interested in being part of this exciting opportunity or have any questions about CARL, please contact Greg Kawchuk at greg.kawchuk@ualberta.ca.

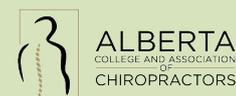
CARL FUNDERS

The CARL Program would not be possible without the generous support from:

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Is your organization interested in supporting CARL? If so, please contact Dr. Adams, Dr. Kawchuk or Dr. Hartvigsen.



Highlights from the CARL Fellows

Alex Breen

After many long hours and working weekends, I have finally generated a data-basing and extraction tool. This tool will let my team calculate new biomechanical measures from the continuous inter-vertebral motion previously gathered with our Quantitative Fluoroscopy Technology. This In vivo Spine kinematics data has been captured from 300 participants with and without chronic low back pain. Having this capability in place will allow my research team to answer important and high impact research questions about spine biomechanics and back health. To help with further data collection 3 new undergraduate research assistants will be joining my team under my supervision (2 Chiropractic students and 1 Biological Sciences student).



Diana De Carvalho



This fall I had the opportunity of taking a Systematic Review and Meta-Analysis course in our Clinical Epidemiology Unit. This was a great in-depth and hands on exposure to theory and methods peripheral to my own expertise area. My graduate students have finished two large research experiments and we are now in the process of setting up our new Canadian Foundation for Innovation funded equipment – an active motion capture system and wireless electromyography! Excited for my lab's first publications to be submitted and the next series of studies to begin in the winter.

Katie de Luca

My highlight for the recent quarter was the publication of an invited review from the journal, Best Practice & Research Clinical Rheumatology (IF: 2.6). My paper, co-authored with Associate Professor, Manuela Ferreira, will be included in a special issue on Ageing and Musculoskeletal Health. The paper is titled "Spinal pain and its impact on older people". It includes a comprehensive discussion on common musculoskeletal conditions in the elderly and the impact spinal pain has on function, wellbeing and independence within the community.



Andreas Eklund



This autumn's main highlight was having the opportunity to present our project "Prevention of low back pain: effect of chiropractic maintenance care as compared to symptomatic treatment – a pragmatic randomized clinical trial" (*Authors: Andreas Eklund, Irene Jensen, Malin Lohela-Karlsson, Charlotte Lebouf-Yde, Alice Kongsted and Iben Axén*) at Institut Franco-Européen de Chiropraxie (IFEC) in Paris and Toulouse. Focus was to summarize the background from the Nordic Maintenance Care program, as well as the latest findings from the RCT describing effect, clinical mechanism and subgroup evaluation.

Matthew Fernandez

Highlights include our CARL project: *The profile of chiropractors managing patients with low back-related leg pain: Analyses of 1,907 chiropractors from the ACORN practice-based research network*, winning best presentation at CA-COCA conference 2017. This manuscript has recently been submitted for publication. I was also an invited speaker for the CAA NSW Annual seminar (September) and CAA National conference (October). My presentation 'beyond back pain' at the National conference resulted in a recent Podcast with the CAA National President.





Martha Funabashi

Besides CARL projects, I am still working on 2 jobs (Research Associate at the Collaborative Orthopaedic Research – CORE; and as the SafetyNET lead coordinator) and am collaborating with 4 side projects. I am currently coordinating about 8 clinical studies, from which 3 are finalizing data collection. I am currently working on 2 manuscripts and analyzing data from 2 other studies. In addition, I was recently in Norway to give an invited presentation at the Norwegian Chiropractic Association Congress 2017.

Michelle Holmes

In September I started a new position as Lecturer in Research Methods at AECC University College (formerly the Anglo European College of Chiropractic). As well as teaching on several research modules, I am involved in starting a series of research meetings for staff and hosting the first research conference for staff and students in April. Based on my work here, I am starting a program of research on the pedagogy of learning research for evidence-based practice.



Melker Johansson

Parallel to progressing with my PhD project, I have been teaching at University of Southern Denmark and participating in a very interesting PhD-course about health effects from exercise (Exercise as Medicine, Center for Physical Activity Research, Copenhagen, Denmark). I have also had the pleasure of presenting at the Danish association of occupational health and safety consultants' annual conference in a workshop about sedentary behavior during work and its effect on health.

Craig Moore

It was a highlight to be a podium and poster finalist at both Australian national conferences this year (October 2017). My 2nd PhD manuscript was accepted by the journal BMC Complementary and Alternative Medicine with my 3rd PhD manuscript now under review. In November, I passed my Stage 2 PhD assessment. I was honored to convene the CAA national research symposium and award Professor David Cassidy the Giles Medal for Research Excellence in October at the CAA national conference. In December, I provided a webinar presentation on the diagnosis and management of common recurrent headaches.



Isabelle Pagé

I have 2 scientific abstract submissions accepted as a poster presentation (first author) and a platform presentation (co-author) at the 2018 Associations of Chiropractic Colleges - Research Agenda Conference (ACC-RAC) that will occur in Dallas (USA) in March 2018. In addition to being a lecturer in the Pathomechanics and Functional Analysis course in the chiropractic department at my institution, I have dedicated the past 4 months to recruiting and evaluating about 85 participants with thoracic pain to complete the last study related to my PhD.

Katie Pohlman

In September, I was asked to be acting director at the Research Institute within Parker University. This role has given me an appreciation for administrative support and another look at balancing priorities. In October, with CARL fellow and mentor, Drs. Martha Funabashi and Greg Kawchuk, we conducted an End-of-Grant meeting for the SafetyNET team grant from CIHR. It is with high hopes that the work started in this study can continue with collaborations among CARL fellows. My PhD adventure continues with defense planned to occur in Winter / Spring 2018 (hoping prior to our next residential). And, after a year in submission, my PhD RCT methods protocol has just been accepted to *Trials*.





Mike Swain

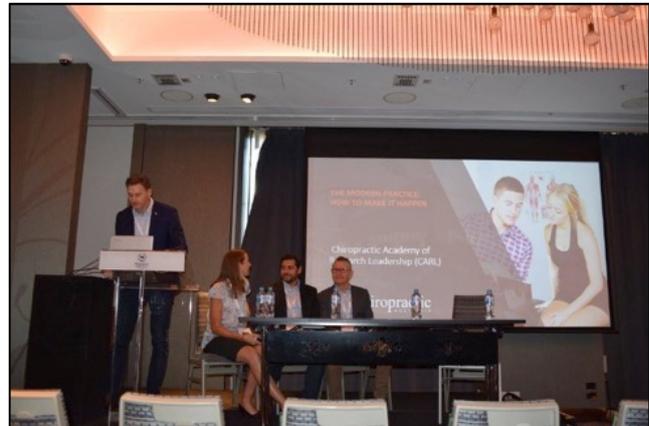
It's been a busy Quarter for me. In September, I presented my PhD work at the 5th International Forum on Back and Neck Pain Research in Primary Care in Oslo, Norway. In October, I presented CARL project work at both the 2017 CA-COCA National Conference and the Chiropractors' Association of Australia National Conference both of which earned Best Poster Awards. I had the honor of facilitating an academic visit at Macquarie University. CARL Mentor Jan Hartvigsen was conferred the academic title of Visiting Professor at Macquarie University while in Sydney, in recognition of his expertise within the field of musculoskeletal disorders.

Arnold Wong

During the period between July and November 2017, my 2 PhD students won 3 academic awards at 3 international post-graduate conferences in the UK, Africa and China. They published 6 peer-reviewed papers related to ergonomics among construction workers. Additionally, my two MSc students were awarded the Dean list.



This fall I had the chance to help organize the Hong Kong Physiotherapy Conference 2017 where Dr. Manuela Ferriera and Paulo Ferriera were the guest speakers. Approximately 200 physiotherapists attended the conference. Further, I was invited as the guest speaker for two overseas conferences: 1) the Yonsei International Geriatric Physical Therapy Conference 2017 in September, and 2) the 11th Hellenic Spine Congress in Athens, Greece in November (invited by Dr. Theodoros Grivas).



Craig and Jan catching up in Sydney (left). CARL fellows Mike, Katie D, Matt and Craig setting up for their panel session at COCA in Sydney, Australia (right).

CARL Projects - Publications since April 2017

1. **Adams, J., Kawchuk, G., Breen, Ax., De Carvalho, D., Eklund, A., Fernandez, M., Funabashi, M., Holmes, M.M., Johansson, M.S., de Luca, K., Moore, C., Page, I., Pohlman, K.A., Swain, M.S., Wong, A.Y.L., Hartvigsen J.** (2017) Leadership and capacity building in international chiropractic research: Introducing the Chiropractic Academy for Research Leadership (CARL). *Chiropr Man Therap.* (Accepted)
2. **de Luca, K., Gliedt, J., Fernandez, M., Kawchuk, G., Swain, M.** (2017). The identity, role, setting, and future of chiropractic practice: a survey of Australian and New Zealand chiropractic students. *J Chiropr Educ.* (In press)
3. **Moore, C., Adams, J., Leaver, A., Lauche, R., Sibbritt, D.** (2017) The treatment of migraine patients within chiropractic: Analysis of a nationally representative survey of 1869 chiropractors. *BMC Complement Altern Med*, 17(1), 519. doi: 10.1186/s12906-017-2026-3

CARL Projects - Conference Abstracts since July 2017

- **International Back and Neck Pain Research Forum, September 2017, Oslo, Norway.**
 1. **Kawchuk, G.,** Graham, S., Kawchuk, J., **Wong, A.Y.L.** Do physiological limits of human touch prevent clinicians from appreciating relevant biomechanical changes in patients with low back pain? (poster)
- **CA-COCA National Conference, October 2017, Melbourne, Australia.**
 2. **de Luca, K.,** Gliedt, J., **Fernandez, M., Kawchuk, G., Swain, M.** The identity, role, setting, and future of chiropractic practice: a survey of Australian and New Zealand chiropractic students. (podium)
 3. **de Luca, K., Swain, M., Wong, A.Y.L., Funabashi, M., Adams, J.** Professional and practice characteristics of rural Australian chiropractors: A secondary analysis of the Australian Chiropractic Research Network (ACORN) project data. (podium)
 4. **Fernandez, M., Moore, C.,** Peng, W., **de Luca, K., Pohlman, K.A., Swain, M., Adams, J.** The profile of chiropractors managing patients with low back-related leg pain: Analyses of 1,907 chiropractors from the ACORN practice-based research network. (podium)
 5. **Moore, C.,** Leaver, A., Sibbritt, D., **Adams, J.** Factors associated with the use of primary headache diagnostic criteria. Analysis of a cross-sectional survey of Australian chiropractors. (podium)
 6. **Pagé I., Breen Ax., De Carvalho D., Kawchuk G., Funabashi M., Swain M., Wong A.Y.L.** Is lumbar spinal stiffness, assessed using a novel rolling mechanical device correlated with anthropometric factors in a normal sample of participants? (poster)
- **CAA National Conference, October 2017, Canberra, Australia.**
 7. **Pagé, I., Breen, Ax., De Carvalho, D., Kawchuk, G., Funabashi, M., Swain, M., Wong, A.Y.L.** Is lumbar spinal stiffness, assessed using a novel rolling mechanical device correlated with anthropometric factors in a normal sample of participants? (poster)
 8. **de Luca, K.,** Gliedt, J., **Fernandez, M., Kawchuk, G., Swain, M.** The identity, role, setting, and future of chiropractic practice: a survey of Australian and New Zealand chiropractic students. (poster)
 9. **Moore, C.,** Leaver, L., Sibbritt, D., **Adams, J.** The management of common recurrent headaches by chiropractors: A descriptive analysis of a nationally representative survey (podium)
- **Musculoskeletal, Bone & Joint Health Alliance, October 2017, Sydney, Australia.**
 10. **Fernandez, M., Moore, C.,** Peng, W., **de Luca, K., Pohlman, K.A., Swain, M., Adams, J.** The profile of chiropractors managing patients with low back-related leg pain: Analyses of 1,907 chiropractors from the ACORN practice-based research network. (podium)

Ongoing CARL Research Projects

The identity, role, setting, and future of chiropractic practice: a survey of Australian and New Zealand chiropractic students

In October 2017, this work was presented as a podium presentation at the Chiropractic Australia National Conference in Melbourne and as a poster presentation at the Chiropractic Association of Australia National Conference in Canberra, where it won the best poster award. This project has now been accepted for publication in the Journal of Chiropractic Education. In conclusion, we are able to report that chiropractic students in Australia and New Zealand seem to hold both traditional and mainstream viewpoints toward chiropractic practice. However, students from different chiropractic institutions have divergent opinions about the identity, role, setting and future of chiropractic practice, which is most strongly predicted by the institution. Chiropractic education may be a potential determinant of chiropractic professional identity, raising concerns about heterogeneity between chiropractic schools.

Lead: Katie de Luca

Working group members: Michael Swain, Matt Fernandez, Greg Kawchuk

Associations between individual characteristics and spinal stiffness: a combined analysis of multiple datasets

The objective of this study is twofold. Data from four separate cross-sectional studies were analyzed together in order to compare participant characteristics, such as anthropometrics, age and gender with spinal stiffness. A secondary objective explores differences in outcome measures obtained with different spinal stiffness testing devices and protocols. [This manuscript has been submitted for publication.](#)

Lead: Isabelle Pagé

Working group members: Greg Kawchuk, Arnold Wong, Martha Funabashi, Diana De Carvalho, Alexander Breen, Michael Swain

Centre of rotation study

A systematic review looking at biomechanical testing investigating the center of rotation location on the lumbar spine is currently being conducted. From the results of this systematic review, a biomechanical testing study will be designed to investigate the influence of center of rotation location on the forces experienced by spinal tissues.

Lead: Martha Funabashi

Working group members: Diana De Carvalho, Alex Breen, Isabelle Pagé, Greg Kawchuk

Australian Chiropractic Research Network (ACORN) rural data analyses

There is a paucity of empirical data that describes the differences in demand or characteristics between chiropractors serving in urban and rural Australian communities. The aim of the current project is to report the prevalence and describe the clinical management characteristics of chiropractors practicing in urban and rural areas of Australia using a large nationally representative sample of Australian chiropractors. We are able to report that a substantial number of chiropractors practice in rural Australia. These chiropractors are more likely to treat a wide range of musculoskeletal cases among an indigenously diverse and ageing group of patients. Unique practice challenges for rural chiropractors include isolation in sole private practice, having a higher workload and a lack of diagnostic tools. Chiropractors appear to play an important role in the provision of health care to rural Australians. [This project has been submitted for publication and was presented as a podium presentation at the Chiropractic Australia National Conference in Melbourne, October 2017.](#)

Lead: Katie de Luca

Working group members: Mike Swain, Isabelle Pagé, Martha Funabashi, Arnold Wong, Jon Adams

Challenges and lessons for recruitment within chiropractic studies

An analysis of recruitment and retention data from three studies, a narrative discussion on challenges of recruitment and potential suggestions for future studies. Currently collecting and pooling data.

Lead: Michelle Holmes

Working group members: Alex Breen, Martha Funabashi, Katie Pohlman, Isabelle Pagé

Common mechanical themes among persons referred for Objective Spine Motion Imaging Assessment

A retrospective analysis of existing spinal kinematic data from AECC University College's Quantitative Fluoroscopy database will be used to determine common mechanical themes among persons referred for Objective Spine Motion Imaging Assessment (OSMIA). Data collection is well under way with motion data from 52 participants collated.

Lead: Alex Breen

Working group members: Andreas Eklund, Isabelle Pagé, Martha Funabashi, Matt Fernandez, Greg Kawchuk, Diana De Carvalho

Does lower limb joint pain increase the risk of low back pain in older women?

This study will use the Australian longitudinal study on women's health data to explore whether the presence of lower limb joint pain is associated with a higher prevalence and severity of low back pain. Introduction has been drafted and we are currently conducting data analysis.

Lead: Arnold Wong

Working group members: Katie de Luca, Andreas Eklund, Jan Hartvigsen, Jon Adams, Isabelle Pagé, Matt Fernandez, Lynn Parkinson, Roos E

Does psychological profile, pain intensity and self-rated health modify the association between expectations and the short-term subjective improvement in patients with low back pain? A longitudinal multicenter trial

The objectives of the study are to investigate if patient expectations predict short-term subjective improvement of recurrent and persistent low back pain and to explore whether psychological profile, pain intensity and self-rated health modify the relationship between expectations and outcome. Data analysis was completed this past fall and the manuscript is in the final stages. Submission is expected in January 2018.

Lead: Andreas Eklund

Working group members: Diana De Carvalho, Isabelle Pagé, Arnold Wong, Melker Johansson, Jan Hartvigsen, Katie Pohlman, Mike Swain

Multi-site joint pain in older Australian women

Up to 80% of adults have experienced at least one joint pain site in the last 12 months. Interestingly, people with low back pain usually experience concomitant pain at other spinal levels and people with extremity pain have pain in adjacent joints. Multiple factors predict multi-site joint pain syndromes, however no studies have been performed that report the prevalence and compare the impact of multi-site joint pain in the vulnerable population of older women. This program of study will firstly provide a descriptive analysis of older women with multisite joint pain, and secondly explore clusters of joint pain and their impact on health-related quality of life. Statistical analyses have been completed, with generalized ordinal logistic regression used to describe the association between multi-site joint pain and pain, health, and sociodemographic variables, in older Australian women. This manuscript is currently being prepared for submission.

Lead: Katie de Luca

Working group members: Matt Fernandez, Andreas Eklund, Arnold Wong, Jan Hartvigsen

Practices of female and male chiropractors in Australia: secondary data analysis

The aim of the current project is to report the prevalence and describe the clinical management characteristics of female and male chiropractors using a large nationally representative sample of Australian chiropractors.

Lead: Michelle Holmes

Working group members: Diana De Carvalho, Isabelle Pagé, Martha Funabashi, Katie Pohlman, Katie De Luca, Craig Moore, Jon Adams

Princess and the pea palpation study: Do physiological limits of human touch prevent clinicians from appreciating relevant biomechanical changes in low back pain patients?

The purpose of this study is to quantify the threshold at which clinicians can detect a change in stiffness via palpation and to determine if these detection thresholds influence a clinician's ability to identify clinically significant changes in stiffness. **This manuscript has been submitted for publication.**

Lead: Greg Kawchuk

Working group members: Diana De Carvalho, Alex Breen, Isabelle Pagé, Arnold Wong, Mike Swain, Martha Funabashi

SafetyNET Investigations – Advancing patient safety research for SMT providers

This work involves a series of projects, with current focus on the development of the data collection instruments. The population has been done within a chiropractic teaching institute. Plans are to reach out to practicing doctors on an international platform. The first 2 development projects are listed below:

1. Determine the incidence of mild, moderate, and serious adverse events following SMT administered by chiropractic interns using the SafetyNET active surveillance reporting paper-based system. Data has been collected and manuscript in preparation.
2. Determine the incidence of mild, moderate, and serious adverse events following SMT administered by chiropractic interns using the SafetyNET active surveillance reporting electronic system. Data has been collected and analysis currently being done.
3. Qualitative evaluation of open-ended questions on SafetyNET's Survey to Support Quality Improvement, which was conducted at teaching institutions and among practicing SMT providers. Data being analyzed. Abstract submitted to the Integrative Conference in Baltimore for May 2018

Lead: Katie Pohlman

Working group members: Martha Funabashi, Craig Moore, Mike Swain, Andreas Eklund, Greg Kawchuk, Michelle Holmes

Systematic Review and Meta-Analysis investigating the relationship between objectively measured sitting time and low back pain in adults

Current evidence suggests that self-reported sitting time substantially underestimates actual sitting time when measured objectively (activity monitor, other sensor or direct observation). This project will involve a systematic review of literature, and if possible a meta-analysis of pooled data, to answer the following question: in adults, are longer periods of objectively measured sitting time associated with back pain (perceived ratings of pain, health care visits, lost days of work) compared to shorter periods of sitting time? The protocol for this project has been registered with PROSPERO (CRD42017079738). The initial search and paper selection has been completed with the assistance of a health sciences librarian (MS) and data extraction with two independent researchers (DDC and KD) is currently underway. Next phases include the quality assessment and determination of studies to be included for the qualitative and quantitative analyses.

Lead: Diana De Carvalho

Working group members: Katie de Luca, Martha Funabashi, Jan Hartvigsen, Arnold Wong, Alex Breen, Jon Adams, Greg Kawchuk, Manuela Ferriera, Michelle Swab, and Melker Johansson

The frequency of light or heavy physical activity and all-cause mortality: a longitudinal study of elderly Danish twins

The purpose of this study is to investigate the association between the frequency of different levels of physical activity and all-cause mortality, cardiovascular disease- and cancer-specific mortality in elderly Danish twins. This study is currently awaiting approval from the Danish Twin Registry.

Lead: Matt Fernandez

Working group members: Melker Johansson, Eleanor Boyle, Arnold Wong, Katie Pohlman, Mike Swain, Greg Kawchuk, Kaare Christensen, Jan Hartvigsen

The profile of chiropractors managing older patients: Analyses of chiropractors from the ACORN practice-based research network

The aim of the current project is to determine practitioner and practice-related factors associated with the frequent treatment of older people by Australian chiropractors, using a large nationally representative sample of Australian chiropractors. This manuscript is currently in the late stages of completion and is expected to be submitted for publication in February 2018.

Lead: Craig Moore

Working group members: Katie de Luca, Arnold Wong, Matt Fernandez, Michael Swain, Jan Hartvigsen, Jon Adams

The profile of chiropractors managing patients with low back-related leg pain: Analyses of 1907 chiropractors from the ACORN practice-based research network

This study is a secondary analysis of a cross-sectional survey of Australian chiropractors who are members of the Australian Chiropractic Research Network (ACORN) - a national practice-based research network. The aim of this paper is to investigate the prevalence and profile of chiropractors who have a high caseload of low back pain with related leg symptoms, and is considered representative of the wider Australian chiropractic profession. The study objectives are to investigate: 1) the proportion of Australian chiropractors who regularly treat patients who present with lumbar pain and associated referred or radicular symptoms; and 2) the practitioner characteristics, clinical practice characteristics, clinical management characteristics, and patient management factors associated with those chiropractors who frequently manage patients who present with lumbar pain and associated referred or radicular symptoms. **This manuscript has been completed and submitted for publication.**

Lead: Matt Fernandez

Working group members: Craig Moore, Katie de Luca, Katie Pohlman, Mike Swain, Jon Adams

What's behind the development of Transient Sitting-Induced Back Pain in Healthy Participants?

Using data from a laboratory controlled study; this study will explore the qualitative factors that may explain why some individuals, with no history of low back pain, develop transient back pain during prolonged sitting. Statistical analysis and results figures have been completed, manuscript to move forward in the new year.

Lead: Diana De Carvalho

Working group members: Alex Breen, Arnold Wong, Martha Funabashi, Isabelle Pagé, Greg Kawchuk and graduate student Matthew Barrett

Physical activity endorsement by Australian chiropractors: analyses of 1,924 from the ACORN practice-based research network

Apart from the management of spinal pain, chiropractors are also recognised as advocates for active lifestyle promotion, with at least 90% prescribing or advising on physical activity throughout their consultations. Indeed, the chiropractic profession is ideally positioned to promote the health benefits of physical activity, yet the knowledge about the role these providers play regarding the management of this lifestyle-related risk factor is limited, particularly regarding their clinical characteristics. The aim of this current study is to therefore understand the role Australian chiropractors play within this public health field, by investigating their practitioner, practice and patient management features with respect to physical activity recommendations. This manuscript is currently being written for submission.

Lead: Matt Fernandez

Working group members: Moore C, Adams J, D Sibbritt, de Luca K, Johansson MS, Eklund A, Swain M, Peng W

Forces during Spinal Manipulative Therapy (SMT)

This is a secondary analysis of data from Martha's doctoral work that will investigate how SMT forces are distributed within spinal tissues.

Lead: Martha Funabashi

Working group members: Diana De Carvalho, Alex Breen, Isabelle Pagé, Greg Kawchuk

Chiropractic student identity: a global secondary data analysis

A secondary data analysis of surveys surrounding identity of European, North American, Australian and New Zealand chiropractic students. This project is currently in ethics and pooling data together.

Lead: Michelle Holmes

Working group members: Katie de Luca, Mike Swain, Dave Newell, Jordan Gliedt

Apportionment of lumbar intervertebral motion in a standardized flexion and return protocol using fluoroscopy: basic data to improve current spine models

Recent studies using standardized image acquisition protocols have indicated that the sharing of motion between lumbar levels during bending may be a mechanical marker in low back pain. To support future comparative studies, this project aims to outline a standardized protocol and to identify the how continuous intervertebral motion for L2-S1 during weight-bearing flexion and return in 78 asymptomatic individuals is taken up by each functional spinal unit. The use of quantitative fluoroscopy allows for continuous accurate in-vivo intervertebral lumbar spine motion measurement, the outputs of which are critical to inform dynamic multi-segmental spinal models and for comparisons in patients with low back pain which is suspected to have a mechanical origin.

An abstract for this projects presentation has been submitted to the 8th World Congress of Biomechanics.

Lead: Alex Breen

Working group members: Diana De Carvalho, Arnold Wong, Greg Kawchuk, Isabelle Pagé, Martha Funabashi, Michael Swain, Alan Breen



CARL Fellows taking a well-deserved break at dinner, after meeting with other research groups, specifically researchers from the complementary medicine and Naturopathy leadership program in Sydney, Australia.

Ongoing CARL Leadership Projects

Allied leadership workshop, Sydney, Australia

Driving innovation together in a changing Allied Health landscape – one day workshop; Sydney, Australia. Led by Matt Fernandez.

CARL projects on Researchgate.net

Raising the profile of CARL fellows through reporting CARL specific outputs utilizing Researchgate.net's "Projects" pages. Alex Breen will curate this page as CARL specific citable outputs are in press.

CARL representation at Chiropractic Australia's (CA) and Chiropractors' Association of Australia's (CAA) National Conferences

In October 2017, CARL Fellows Katie de Luca, Matthew Fernandez, Craig Moore and Michael Swain gave a keynote presentation at the CA National Conference in Melbourne. This was an introduction to the Chiropractic Academy of Research Leadership, and introduced the Australian Fellows to the CA membership. It was a great opportunity to highlight CARL and present our research interests and leadership initiatives. In addition, Jan Hartvigsen introduced CARL during his keynote speech at the CAA national conference in Canberra. Mike was involved in the organization of the 2017 Researchers Day at the CA-COCA and Craig was involved in organising the CAA research symposium in October.

Council and Board Memberships

Renewed as chair of the scientific council of the Swedish Chiropractic Association, Andreas Eklund
Research Chair of Sports Chiropractic Australia, Katie de Luca
Executive Member, Chiropractic Australia, Michael Swain
Committee Member, Pain Management Clinical Interest Group (PMCIG), Michael Swain
Director, Chiropractic Research Limited (a funding body associated with Chiropractic Australia), Katie de Luca

Editorial boards

- Editorial committee member of the ACFAS (Association Francophone pour le Savoir) magazine entitled *Découvrir*, Isabelle Pagé
- Editorial committee member of *Journal of the Canadian Chiropractic Association*, Diana De Carvalho
- Guest associate editor of a special theme entitled "Neurophysiological changes and low back pain" in *Frontiers in Neuroscience*, *Frontiers in Psychology*, *Frontiers in Neurology*, and *Frontiers in Systems Neuroscience*, Arnold Wong
- Special issue on "Managing Musculoskeletal Conditions" in the *Advances in Integrative Medicine*. Guest editors: Katie Pohlman and Jan Hartvigsen

Women in Chiropractic Research Mentorship Group

The goal is to create a mentorship group as a resource for the unique complexities that can present for female chiropractors at various stages of their research career – from graduate student to clinician and to scientist. Led by Diana De Carvalho.

Unit of Intervention and Implementation Research for Worker Health, Karolinska Institutet, Sweden

Andreas Eklund is working on an application for the initial projects in a research program with the aim of implementing the findings from the Nordic Maintenance Care Program among northern European Chiropractors.

Please Notice This



There is an open position for a full-time professor/researcher in the chiropractic department and in the anatomy department at the Université du Québec à Trois-Rivières.
Deadline for applications is March 2, 2018.

CARL Fellows – Individual Publications since April 2017

1. **Adams, J.**, Lauche, R., Peng, W., Steel, A., **Moore, C.**, Amarin-Woods, L.G., Sibbritt, D. (2017). A workforce survey of Australian chiropractic: the profile and practice features of a nationally representative sample of 2,005 chiropractors. *BMC Complement Altern Med*, 17(14).
2. **Adams, J.**, Peng, W., Cramer, H., Sundberg, T., **Moore, C.**, Amarin-Woods, L., Sibbritt, D., & Lauche, R. (2017). The prevalence, patterns, and predictors of chiropractic use among US adults: Results from the 2012 National Health Interview Survey. *Spine (Phila Pa 1976)*, 42(23), 1810-1816. doi: 10.1097/BRS.0000000000002218.
3. **Adams, J.**, Peng, W., Steel, A., Lauche, R., **Moore, C.**, Amarin-Woods, L., & Sibbritt, D. (2017) A cross-sectional examination of the profile of chiropractors recruited to the Australian Chiropractic Research Network (ACORN): a sustainable resource for future chiropractic research. *BMJ Open*, 7(9), 1-8. doi: 10.1136/bmjopen-2017-015830.
4. Antwi-Afari, M., Li, H., Seo, J., Edwards, D., Pam, E., Owusu-Manu, D., & **Wong, A.Y.L.** (2017). Identification of potential biomechanical risk factors for low back disorders during repetitive rebar lifting. *Construction Innovation: Information, Process, Management*, (accepted).
5. Antwi-Afari, M.F., Li, H., Edwards, D., Parn, E., Seo, J.O., & **Wong, A.Y.L.** (2017). Biomechanical analysis of risk factors for work-related musculoskeletal disorders during repetitive lifting task in construction workers. *Automation in Construction*, 83, 41-47. <https://doi.org/10.1016/j.autcon.2017.07.007>.

Upcoming Events

- Association of Chiropractic Colleges – Research Agenda Conference 2018: Competencies and Collaboration, Dallas, Texas, USA - March 2018. [Website](#).
 - Page – poster & platform (co-author) presentations
 - Pohlman – Moderator of a Plenary Session; 6 platform presentations (co-author) and 1 poster presentation (co-author)
- BritSpine, Leeds, England –March 2018. [Website](#).
- Canadian Chiropractic Association National Convention and Tradeshow; Calgary, Alberta, Canada – April 2018. [Website](#).
- SOSORT meeting 2018, Dubrovnik, Croatia – April 2018. [Website](#).
 - Abstract submissions closes December 31, 2017.
- OARSI World Congress, Liverpool, UK – April 2018. [Website](#).
- Sports Chiropractic Australia Research Symposium, Gold Coast, Australia – April 2018. [Website](#).
- The International Society for the Study of the Lumbar Spine, Banff, Canada – May 2018. [Website](#).
 - Funabashi, Kawchuk, Pohlman have 1 abstract submitted.
- International Congress on Integrative Medicine & Health; Baltimore, Maryland, USA, – May 2018. [Website](#).
 - Funabashi, Pohlman have 1 abstract submitted.
- The European Chiropractors' Union Annual Convention, Budapest, Hungary – May 2018. The theme of the forthcoming convention is "The Seven ages of Man". [Website](#).
 - Abstract submission deadline is 17th March 2018, abstract acceptance notification 17 April 2018.
 - Eklund is planning to send in 3 abstracts.
- 8th World Congress of Biomechanics; Dublin, Ireland – July, 2018. [Website](#).
 - Call for abstracts closes January 4, 2018.
- International Ergonomics Association 20th Congress; Florence, Italy –August 2018. [Website](#).
 - Closing "Call for papers": Abstracts and Symposia: 15 December 2017.
- WFC Educational Conference; London, England – October 2018. [Website](#).
 - Call for abstracts closes 1 May 2018.
 - Pohlman, Holmes – Plan to submit a workshop.
- World Congress on Pain 2018, Boston, USA – September 2018. [Website](#).
 - Abstracts submission open in February 2018.
- 7th International Society for Physical Activity and Health Congress, London, UK – October 2018.