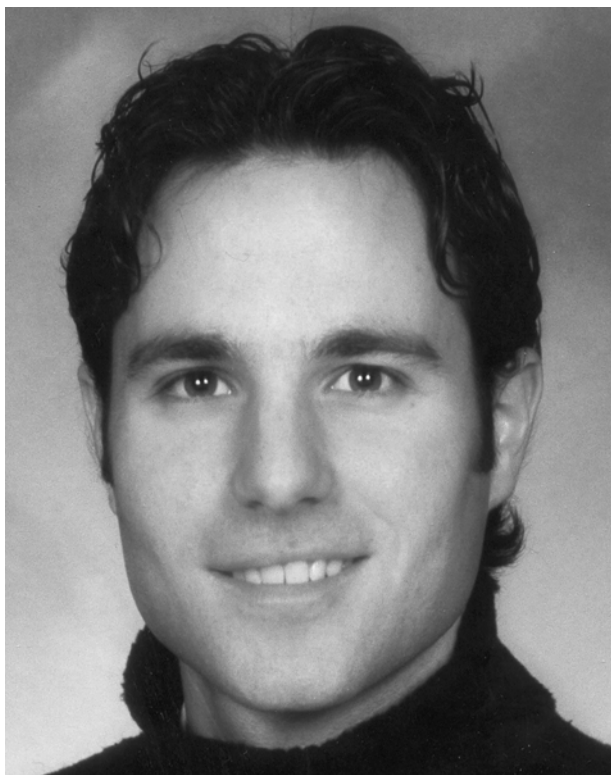


Profile – Dr. Mathieu Piché, DC, MSc, PhD (candidate)



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Dr. Mathieu Piché earned his undergraduate degree in chiropractic at Trois-Rivières University (UQTR), graduating in 2002. During his undergraduate years, Dr. Piché was introduced to the work of Professor Akio Sato, one of the world's leading neurophysiologists, and immediately saw the implications for chiropractic of the interactions between the autonomic and somatic components of the nervous system. Dr. Piché wrote to Professor Sato about his interests in somato-autonomic research, and Professor

Sato introduced him to Dr. Brian Budgell, who was working in his laboratory at that time. Subsequently, Dr. Piché was able to arrange to visit Japan, allowing him to meet Professor Sato and conduct a short collaboration with Dr. Budgell and colleagues at Kyoto University. This work concerned the effects of cervical spinal manipulation on cardiac autonomic activity in young male athletes.

In 2002, Dr. Piché entered a Masters program at UQTR to pursue his interest in the effects of pain, especially spinal pain, on the autonomic nervous system. Although his motivation is to help patients, Dr. Piché chose to focus on animal-based research at the Masters level in order to develop the fundamental knowledge and skills necessary to investigate human systems. Dr. Piché studied neural adaptive mechanisms in a mutant strain of anophthalmic (blind) mice. Using c-Fos immunohistochemistry and dextran biotin neuronal tracing, Dr. Piché and colleagues at UQTR examined the reorganization of sensory modalities in the brains of blind mutant mice raised in either enriched or standard environments. They found that auditory stimulation elicited strong neuronal activation in thalamic and cortical structures that are normally devoted to visual functions. An important finding was that auditory-evoked cortical activity was considerably enhanced in blind mice raised in an enriched environment. This animal model has obvious implications for neuronal mechanisms underlying some cross-modal sensory phenomena observed in blind or deaf humans. Dr. Piché's research resulted in a number of presentations at prestigious neuroscience meetings including the annual meetings of the Society for Neuroscience. Additionally one paper has been published in the *European Journal of Neuroscience*, while others are in preparation. Dr. Piché's work addresses the fundamental mechanisms of plasticity, and would also have application to understanding the complex adaptive (or maladaptive) changes in the nervous system when patients suffer with chronic pain.

With the lessons learned during his Masters studies, Dr. Piché is now investigating central responses to somatic and visceral pain in human subjects. Dr. Piché has used functional MRI to measure activation within the brain, and is now refining the experimental system to increase the reliability of measures of spinal cord function. Functional MRI of the spinal cord presents special challenges because of the artifacts introduced by cerebrospinal fluid flow. This results in a high degree of variability within and between subjects, eroding the credibility of findings. Dr. Piché and his colleagues are working on cutting-edge methods to filter artifacts from the fMRI signal, so that the technology can be applied to questions of greatest interest to chiropractors.

Dr. Piché observes that patients with chronic pain do not respond uniformly to care, including chiropractic care. One of the great challenges of our profession is to explain why that is so. If we can reliably and non-invasively observe spinal cord function in well subjects and patients, we may gain some insight into the changes in spinal cord function that accompany chronic pain. This, in turn, would allow more precise diagnosis and the design of patient-specific management programs.

Dr. Piché is a relatively new member of the profession but has already developed a very impressive research resume. He deserves personal credit for his intelligence and industriousness. However, circumstances have also played an important role in his growth as a researcher. Certainly in the past it was so, and even today it is fair to say that most chiropractic researchers are essentially “hobbyists” who are obliged to squeeze in studies between teaching or clinical obligations. Dr. Piché has been very fortunate to receive strong support from the profession, allowing him to devote himself virtually full-time to experimentation. This sort of environment cultivates an

entirely different quality of scientist – one who tenaciously pursues a line of research and who is prepared to develop their own techniques allowing them to open up entirely new areas of investigation. Dr. Piché especially credits the Fondation Chiropratique du Québec, which has provided substantial funding for a number of promising young investigators. *The distinctly Canadian strategy of developing career researchers is an intelligent departure for the stop-and-start project-based research which generally characterizes chiropractic, and this is certain to pay dividends in terms of how others view our profession. However, more importantly, it places chiropractic research at the leading edge of understanding, and so more effectively managing, important health issues.*

Dr. Piché has chosen an extraordinarily interesting and clinically-relevant area in which to specialize. He is already looking beyond his Ph.D. to post-doctoral opportunities in the field of chronic pain and neural plasticity. The profession can look forward to more outstanding research which will benefit patients and practitioners alike.

In July 2005, Dr. Piché was awarded a prestigious CIHR Fellowship from the Clinical Research Initiative/Institute of Gender and Health. One of only six recipients, this 4 year award will allow Dr. Piché to continue his research on the neurophysiological mechanisms of chronic pain with Dr. Pierre Rainville PhD and Dr. Michael Bouin MD, PhD at the University of Montreal.

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