

RESEARCH



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It has been too long since our last Calgary Spine Research Newsletter. Since our last communication there have been many changes within our spine program and beyond. The last two years have been a time of unprecedented change associated with social upheaval and division, largely owing to the pandemic. Our research efforts have not been sheltered from these far-reaching effects.

Dr. Ken Thomas



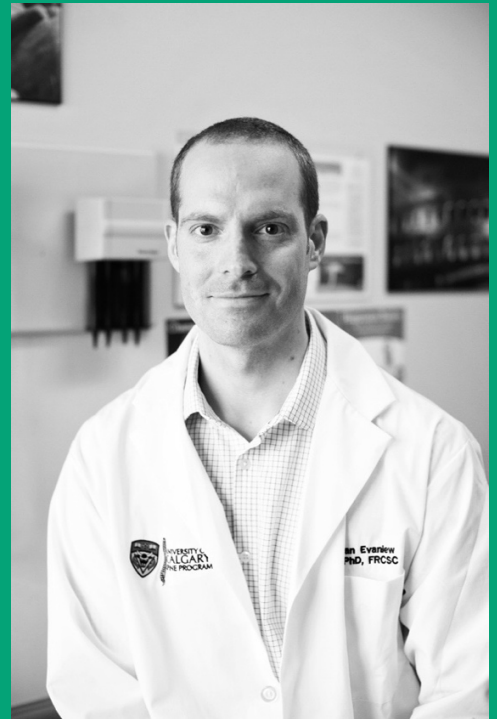
Our spine patient enrolment/participation in various prospective study and registry efforts have been hampered due to the necessary Covid-19 restrictions. Many of our research initiatives are multicenter collaborations and as such we are not alone dealing with this frustration. All organizations have had to adopt a spirit of fluidity, change and resiliency – attributes that will likely prove useful long after the pandemic subsides.

NEW STAFF



Despite the current pandemic environment, there have been many positives to be thankful for. We have been fortunate to hire Vicki Smith, a newer spine research coordinator (with a psychology background) back in July of 2020. Vicki assumed the roles and responsibilities of one of our former coordinators who moved cities for family reasons. Given her psychology roots, working with a group of diverse spine surgeons will give Vicki ample fodder for thought.

Dr Nathan Evaniew joined the Calgary Spine Surgery program during the Fall of 2020. Dr Evaniew, an orthopaedic surgeon, has 2-years of subspecialty spine surgery training as well as a PhD within the field of clinical epidemiology. He is an avid clinical researcher and an excellent surgeon. His calm and thoughtful demeanor will be of benefit to us all. Welcome!

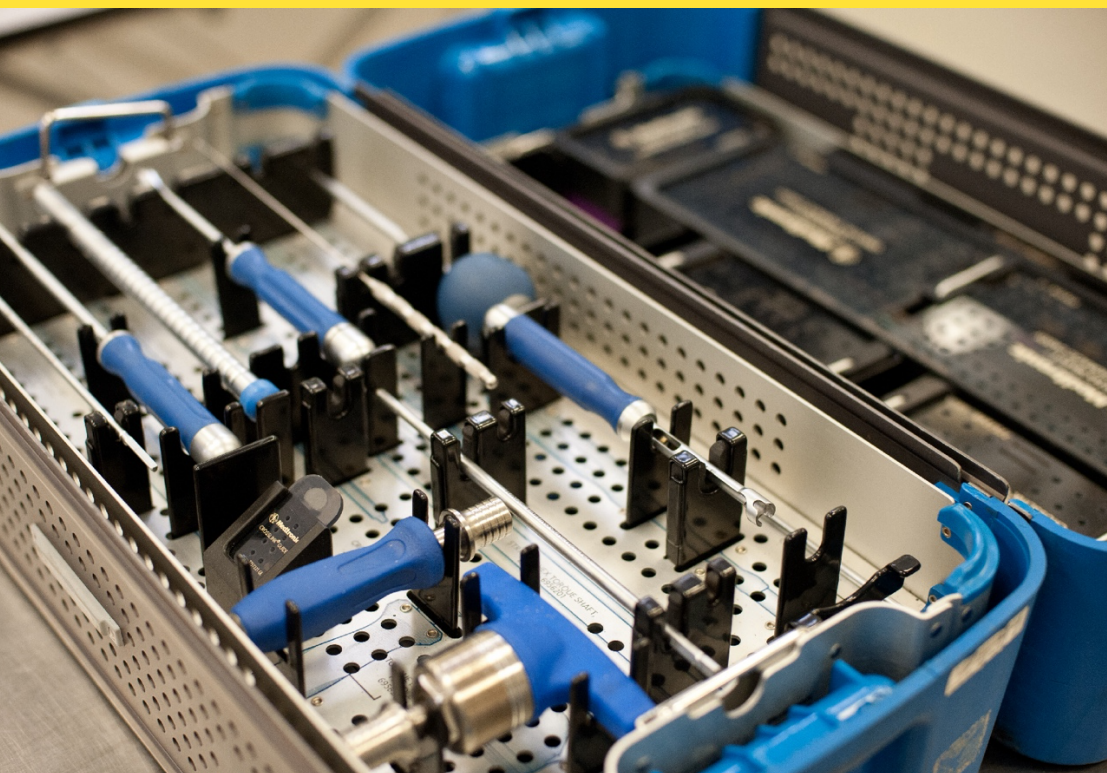


The Alberta Spine Foundation recently held its 7th Annual Grant Competition with awards being announced September 2021. This competition is open to clinical and basic scientists within Alberta so long as their research focus is on a spine-related topic. Three \$25,000 awards were as follows:

- 1. Delivering precision medicine to patients with degenerative cervical myelopathy
– Dr. David Cadotte
- 2. Quantification of In-vivo 3D cervical spine motion for cervical TDA
– Drs. Ronsky/Swamy (part 1 of a three-part study)
- 3. Murine intervertebral disc transplantation model to investigate serum cytokine and proteome: do mouse strain differences result in differential innate immune responses
– Dr. Swamy

The ASF Calgary chapter is thankful to have developed a partnership with the McCaig Institute to collaboratively hire and mentor undergrad summer students whose research has a spine focus.

During the summer of 2021, ASF Calgary Chapter funded 3 summer students under the guidance of Drs. Brent Edwards, Roman Krawetz and Alex Soroceanu.



dScoli / dSpondy study

Dr. Ganesh Swamy

Scoliosis occurs in adolescents (Adolescent Idiopathic Scoliosis - AIS) and in adults (degenerative Scoliosis (dScoli)), and the etiology is unknown. While a mechanical hypothesis exists for both AIS and dScoli, the predominantly female prevalence (~90% for both) remains underexplored. In addition, approximately 70-75% of patients with degenerative Spondylolisthesis (dSpondy) are women. There are some suggestions of sex hormone involvement, but the basic molecular mechanisms are unknown. dScoli/dSpondy also occur around the time of menopause, which further raises sex hormone involvement.

The central tenet of our investigations is to understand why some females are predisposed to this problem. We feel that there should be a mechanical difference in the intervertebral disc (IVD).

Our center is well-suited for such an investigation. With engineers and scientists of the McCaig Institute for Bone and Joint Health a walk away, surgeons can collaborate to answer questions.

To date, Taylor, our second-year graduate student in this study, has collected nearly 60 anterior and lateral annulus fibrosus samples from the operating room. These samples are cut into 5mm³ cubes and mounted in the axial plane to mimic the translation seen in dScoli and dSpondy patients (Figure 1). Working with degenerated tissue has resulted in many iterations of the biomechanical testing, but a final protocol is now being implemented. Pilot data shows a noticeable decrease in stiffness in female and deformity samples (Figure 2). Taylor will continue to collect surgical samples for the remainder of this year, while also beginning to collect normal controls through the Southern Alberta Tissue Donation Program.

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Alberta Children's Hospital

Dr. Marina Rosa Filezio

Pediatric Spine Fellow, Brazil

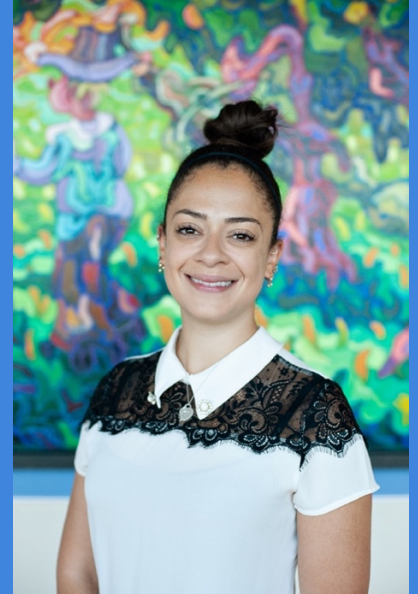
MSc candidate in Population and Public Health.

University of Calgary

Abstract Title: The use of multimedia sources to assist patient and guardian understanding of surgical consent prior to spinal surgery.

Co-supervisor: Maria Santana

Supervisor: Fabio Ferri-de-Barros



Informed consent prior to any procedure is a mandatory step in medical practice. According to the Canadian Medical Protective Association, the consent given in advance to any procedure must be voluntary, the patient or guardian must have the capacity to consent and must also be properly informed prior to consenting. Some studies have demonstrated that the conventional way of informing patients and guardians may not provide enough understanding of all risks, benefits and expectations associated with the surgical procedure for treating adolescent idiopathic scoliosis (AIS). The gap seen while transmitting information about a surgical procedure has been associated with feeling of being stressed and overwhelmed for both patients and parents.

Study Aim: Quantify and compare the questionnaire results of patients and guardians who had multimedia peri-operative teaching versus in person teaching.

Objectives: Primary: Analyze if multimedia teaching enhance patients' and guardians' understanding of the peri-operative process and informed consent. Secondary: Establish if multimedia teaching increase adherence to processes (e.g., post-operative routine), decrease nursing resource utilization (e.g., follow-up phone calls) and improve overall satisfaction.

Research question: How does multimedia teaching, as a method of delivering peri-operative information to patients and guardians, compares to the conventional verbal only format?

Hypothesis: Multimedia teaching may augment patients and parents understanding of risks, benefits and expected results of operative treatment as compared to in person teaching.

Methods: We will conduct a prospective, single center, cohort analysis based on risks, benefits, and outcomes assessment questionnaires. A Paediatric Spine fellow will recruit and analyze data from subjects undergoing posterior spinal arthrodesis for AIS in the Spine Clinic at the Alberta Children's Hospital (ACH). Power analysis will be performed to obtain appropriate sample size.

We will study information uptake by randomizing subjects in two groups of information delivery: multimedia and conventional (verbal only). Subjects will be asked to complete a multiple-choice questionnaire before and after information delivery, and the number of correct answers will be analyzed, as well as demographic variables.

Significance: The results of this study will allow us to measure the possible impact of a new approach for the surgical consent prior to AIS surgical procedure. We expect this allow us to improve the quality of the informed consent in our setting and provide useful information for other clinical scenarios and medical specialties.

Knowledge Translation/Innovation: At this time, the conventional verbal surgical discussion is the main way utilized to teach patients and parents about the surgical procedure for AIS prior to consenting for surgery. The innovation proposed in this study is to create an understandable, concise, patient and guardian friendly explanatory video, containing the necessary information about risks, benefits and expected outcomes which should be discussed during a pre-operative discussion prior to AIS surgical procedure.

LOOKING FORWARD



Our six spine fellows (4 adult spine, 2 paediatric spine) have all been keenly involved in research initiatives during the first half of their fellowship year. We look forward to seeing their projects through to completion. Speaking of completion, the collective spine group has received \$2.2 million in grant funding and published 31 peer reviewed papers this last year.

The Virtual 22nd Annual Scientific Conference of the Canadian Spine Society will take place on Wednesdays throughout the month of April. We'll be watching for presentations from both our fellows and faculty members.

The Annual Report for the last academic year is currently in production. In addition to updates on our clinical operations and research activities, expect summaries on several exciting initiatives including, Dr. Cadotte's Spine Data Strategy.

When the pandemic subsides, we all look forward to a time of renewal and face to face research collaboration.

Dr. Ken Thomas,
Research Director