Clayton Adam Florence Wilson Award
August 2019 Update

Thank You and Welcome Laura...

This year the QUT Biomechanics and Spine Research (BSRG) team has grown as we welcomed **Laura Meszaros** – thanks to the generous support of people like you towards the Clayton Adam Florence Wilson Award.

The inaugural *CAFW Award 2019: PhD Scholarship* was granted to Laura to enable her to develop a 'Virtual Human Spine' model. This innovative approach is based on electromyography (EMG), a technique used to evaluate and record electrical activity produced by skeletal muscles. Laura aims to measure intervertebral disc pressure, intervertebral joint forces and how the many spinal muscles are used during normal day-to-day activities.

For the past 15 years, the BSRG team has been developing a computer based subject specific spine model, which has resulted in a world leading virtual spine model. However, it currently lacks muscular detail. This is the focus of Laura's PhD candidature. By better understanding healthy spines, we can better understand how they work and provide better solutions when they go wrong.

The estimated economic burden for surgical interventions to treat low back pain is in the order of USD $100 billion per year. According to the World Health Organisation, low back pain has reached epidemic proportions, being reported by approximately 80% of the population at some time in their lives and being the single leading cause of disability worldwide.[1] Laura's PhD studies will make a valuable contribution to the current knowledge of how the healthy adult spine functions during normal activity. Ultimately this may also be translated to spines with pre-existing health issues.

1 https://www.who.int/medicines/areas/priority_medicines/BP6_24LBP.pdf

Want more info or to keep helping?

Visit research.qut.edu.au/bsrg
Give bit.ly/CAFWaward
Email sharyn.tidswell@qut.edu.au

Laura Meszaros, inaugural recipient of the 'Clayton Adam Florence Wilson Award 2019: PhD Scholarship' joins the QUT Biomechanics and Spine Research team.

Dedicated to Making a Difference...

The *Clayton Adam Florence Wilson Award* launched late 2018 promotes biomechanics and spine research at QUT, and honours the stellar contribution to scientific innovation in spine research made by our former Research Director, Professor Clayton Adam.

Clayton joined QUT in 1999 and dedicated his work to helping children with spinal disorders. He brought together a dedicated team to perform cutting edge research aimed at minimising risks and improving spinal surgery results for patients. His leadership also resulted in QUT receiving a substantial bequest from a donor, Florence Wilson, impressed by his work.

Despite being diagnosed with cancer in 2015, Clayton continued his active research during treatment until early 2018. Sadly, his battle with cancer ended in March 2018, but his legacy continues.

Qld XRay Supports Two QUT Masters Students in World-First Spine Research

Dr Catherine Choi
Queensland XRay sponsored QUT BSRG Masters Student

Very little data exists to describe the growth and progression of healthy spines. Such benchmark information can be helpful to plan treatment and improve outcomes in children with conditions like scoliosis. Catherine's project uses a world-first sequential MRI dataset of young, healthy adolescent females, and tracks their spinal growth from late childhood to adolescence. This data will provide valuable, new information describing the typical growth behaviour and rate of growth of young Australian girls.

Dr Hardy Jennings
Queensland XRay sponsored QUT BSRG Masters Student

Using a world-first sequential MRI dataset of adolescent idiopathic scoliosis patients, Hardy is developing a new way to measure 3D growth and deformity progression of the individual vertebrae of the spine. This will help track how the vertebral deformity progresses in adolescence, and provide new understanding of how these otherwise-healthy patients' spines grow.

2019/2020
Morphology of the Growing Spine in Adolescent Females

QLD Xray + QUT Masters Program

Scoliosis is a **3 dimensional deformity** of the spine with **long term consequences** for the patient including self image, pain and general health.
In **most cases patients otherwise appear normal** and the cause is defined as **"idiopathic"**.

Scoliosis affects 1-4% of adolescents

Adolescent Idiopathic Scoliosis develops in previously healthy females
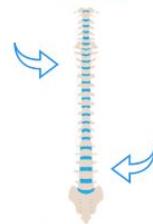
THE 3 KEY ELEMENTS

Longitudinal data set of MRI scans of **healthy female adolescents**

Changes and rates of growth of thoracic vertebrae

Overall thoracic alignment and skeletal growth.

This study will be one of the **first** to look at **normal spinal growth LONGITUDINALLY.** Understanding normal growth parameters allows for better understanding of abnormal growth and pathology in the growing spine.

Catherine Choi 2019

Lifetime impact thanks to Medtronic…

The generous funding provided by Medtronic allows the BSRG team to continue with our core goals of conducting clinically relevant research activities in the area of progressive spine deformity in children. This work results in improvements in the understanding of how spine deformity develops in our children as well as improvements in the techniques that are used to assess, monitor and treat children and adolescents with progressive spine deformities.

Any treatment that is given in childhood or adolescence to correct the deformity and/or stop progression of the deformity will impact the child's quality of life throughout adulthood.

Untreated severe spine deformities continue to worsen gradually with each passing year resulting in pain, psychological impairments, social isolation, unemployment, and reduced heart and lung function which can ultimately shorten life.