



Paediatric Spine Research Group Newsletter September 2012

The QUT/Mater Health Services Paediatric Spine Research Group (PSRG) was formed in 2002 to conduct high quality collaborative research into spinal deformities.

Paediatric Spine Research Group TEN years old & going strong!

The PSRG began in December 2002 thanks to the vision and dedication of Prof. Mark Percy (QUT) and A/Prof Geoff Askin (Mater Health Services). After securing Clayton Adam as the Principal Research Fellow and Maree Izatt as Senior Research Assistant, the group was born. Together with Dr Rob Labrom (from 2004) and Dr Paige Little (from 2006), this core group has supervised 5 PhD students, 6 Masters Students & 13 visiting Spinal Fellow projects. Despite the small size of our group, we have published 38 internationally peer reviewed papers, 3 book chapters and presented our work on 196 occasions at various conferences and meetings in both Australia and overseas. Publications so far in 2012 can be found on Page 2. What will the next 10 years bring?

Thanks to those who have generously supported us so far in 2012. We look forward to continuing to work with our partners & research collaborators into 2013 and beyond.

A/Prof Clayton Adam at home in Paris

Our Principal Research Fellow, Clayton Adam visited us briefly this month from his new base in Paris. Clayton is currently holding a European Union Marie Curie Incoming International Fellowship position under the European Union 7th Framework program. The two year position has certainly captured his interest as has the wonderful city of Paris. Shortly after arriving in Paris he gave a presentation, May 25 at the Laboratoire de Biomecanique, Arts & Metiers Paris Tech on the development of the PSRG's patient-specific computer spine model. His appointment has already opened up collaborative opportunities for the PSRG with European partners and he has somehow managed to also maintain a close involvement with PSRG activities, students & projects.



"Wall of Friends & Advocates" launch at Institute of Health & Biomedical Innovation

The IHBI Wall of Friends and Advocates is an installation of images, words, artworks and photos honouring the contributions of special people to IHBI's growth and development over the past years. Executive Director of IHBI, Prof Ross Young arranged for Assoc. Prof Clayton Adam to be present on August 2 to give the launch presentation honouring Florence Wilson and her generous donations to support Paediatric Spine Research at QUT. Florence Wilson is the inaugural entry on the IHBI Wall located in the IHBI Seminar Room. The event was also an opportunity to thank and honour Major General Peter Arnison and Mrs Barbara Arnison who have been wonderfully supportive of the PSRG, as the General retires this month from his position as Chancellor at QUT.



Above: Prof Young with Major General Peter Arnison and Mrs Barbara Arnison in front of the IHBI Wall of Friends & Advocates.

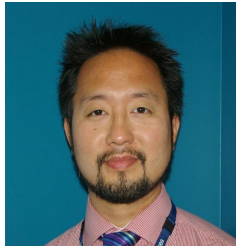
New PSRG Research Masters Candidate & International Fellow

Dr Mark Quick (left) commenced his Research Masters project earlier this year titled "A multi-segmental analysis of growth modulation implants." Growing rods in children with severe and progressive spinal deformity aim to halt progression and provide some correction of the deformities whilst allowing the spine and ribcage to continue growing with the child. The instrumentation used as well as the minimally invasive insertion technique are of great interest, as these modern systems appear to reduce the incidence of common complications such as rod breakage and auto-fusion of spinal segments. Little is known about how these modern implants affect the surrounding spinal tissues and biomechanics. Dr Quick's study will conduct biomechanical tests on immature porcine spines (as a model for young human spines) using single and double growing rods. The effect of the different systems on spinal stiffness will be examined.



We also welcome Dr Eric Huang, our 2012-13 visiting Spinal Fellow (next page), a Canadian trained Orthopaedic Surgeon. His interests include cervical spine surgery, spine trauma, degenerative spine conditions & spinal deformity. He and his wife, Joan, are also looking forward to the birth of their very own little Australian in a few weeks time.

While he is continuing his spinal surgical training in Brisbane, he will also be involved in a research project with the PSRG. His project will analyse the maintenance of correction of the axial torsion component of adolescent idiopathic scoliosis after thoracoscopic anterior spinal surgery which is performed exclusively in Australia by Spinal Orthopaedic Surgeons, Dr Geoff Askin and Dr Robert Labrom at Mater Health Services, in Brisbane.

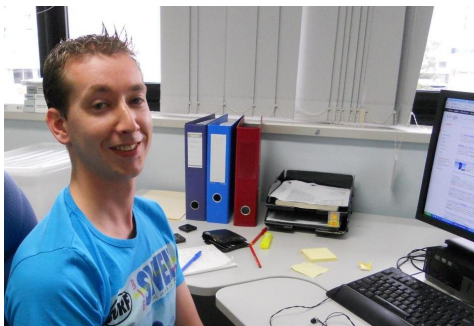


Visiting students from Belgium and The Netherlands

From January to August this year, Ms Vinciane d'Otreppe, an Electromechanical Engineer from the University of Liege in Belgium, undertook an occupational traineeship with the PSRG. She is currently in the final year of her PhD studies where she has been working on computer simulations of the brain. Working with PSRG Engineer, Dr Paige Little, Vinciane further enhanced our patient-specific spine computer model. The more detailed posterior spinal elements and more accurate ligament representation will advance the capability of the model toward providing realistic predictions of surgery outcomes for younger patients undergoing growing rod procedures. The PSRG sends our congratulations and best wishes to Vinciane for her September wedding and hope to entice her back to work with the PSRG in Brisbane in the near future.



We also welcomed a second occupational trainee, Koen Boom (below) from the Eindhoven University of Technology in The Netherlands. Koen, a Biomedical Engineer, is currently completing a Masters of Orthopaedic Biomechanics. His research project with the PSRG will investigate how spinal loading due to gravity contributes to scoliosis spinal deformity. Koen will be using both image processing software and our computer model of the spine to better understand how an individual patient's deformity changes as they move from lying down to standing up.



The Spine Society of Australia 23rd Annual Scientific Meeting, Sydney, 2012.

In April this year, the PSRG was again represented strongly at this key Australian Spine meeting with five papers accepted (two posters and three podium presentations). The theme of this year's meeting was "Minimally Invasive Spinal Surgery under the Microscope," with guest speakers from

San Diego, Louisiana & Seattle, providing the impetus for many lively presentations, discussions and sharing of knowledge. Research Assistant, Maree Izatt (below left), presented a poster entitled, "Is the iPhone a useful clinical tool to monitor spinal deformity patients?" Medical Engineer, Dr Paige Little (below right) gave two podium presentations on the PSRG patient-specific spine model.



1. A computer model to simulate scoliosis surgery,
2. A biomechanical study of the effect of intra-operative surgical forces on scoliosis correction at the apex of the scoliosis curve."

PSRG Publications in 2012!

We are pleased to announce that so far this year we have had 8 internationally peer reviewed papers published, already equalling the number of journal publications in 2011. With the Book Chapter and 18 presentations at conferences, symposiums & various other events, it's been a busy year!

1. **Izatt MT, Adam CJ, Verzin EJ, Labrom RD, Askin GN.** CT and radiographic analysis of sagittal profile changes after thoracoscopic anterior scoliosis surgery. *Scoliosis* 2012 7:15.
 2. **Izatt MT, Bateman G, Adam CJ.** Evaluation of the iPhone with an acrylic sleeve versus the Scoliometer for rib hump measurement in scoliosis. *Scoliosis* 2012 7:14.
 3. **Yong, MR, Izatt MT, Adam CJ, Labrom RD, Askin GN.** Secondary curve behaviour in Lenke Type 1C adolescent scoliosis following thoracoscopic selective anterior thoracic fusion. *Spine* 2012. In Press, ePub April 2012.
 4. **Lin F, Yan C, Zheng W, Fan W, Adam CJ, Oloyede A.** Preparation of mesoporous bioglass coated Zirconia scaffold for bone tissue engineering. *Adv. Materials Research* 365; 209-15.
 5. **Little JP, Adam CJ.** Towards determining soft tissue properties for modelling spine surgery: current progress and challenges. *Medical & Biological Engineering & Computing* 2012 50: 199-209.
 6. **Little JP, Izatt MT, Labrom RD, Askin GN, Adam CJ.** Investigating the change in 3D deformity for scoliosis patients using axially loaded MRI. *Clinical Biomechanics* 2012 27: 415-21.
 7. **Shaw M, Adam CJ, Izatt MT, Licina P, Askin GN.** Use of the iPhone for Cobb angle measurement in scoliosis. *European Spine Journal* 2012 21: 1062-8.
 8. **Adam CJ.** Endogenous musculoskeletal tissue engineering - a focussed perspective. *Cell and Tissue Research* 2012 347: 489-99.
- * **Little JP, Adam CJ.** Patient-specific modelling of scoliosis. Book Chapter in *Studies in mechanobiology tissue engineering and biomaterials. Volume 9, pages 103-131.* Springer Press 2012.

Any questions or want to know more?

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