



RACP Foundation Research Awards

FINAL REPORT

Project / Program Title		Paediatric Emergency Medicine Point-of-Care Ultrasound (PEM POCUS) Traineeship, The Hospital for Sick Children ("SickKids"), Toronto, Canada
Name		Dr Peter James Snelling
Award Received		2016 Queensland State Committee Educational Development Grant
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PROJECT SUMMARY

Point-of-care ultrasound (POCUS) is the simplification of ultrasound technology to a portable machine that can be used at the patient bedside. Its advantages have been extrapolated from its embedded use in the adult emergency department, where it has demonstrated time savings and improved patient care. Although its use has lagged behind its adult emergency counterpart, POCUS holds great promise in paediatric emergency medicine (PEM) given that it is non-invasive, does not emit ionising radiation, and that a child's body habitus is generally ideal for imaging. As the cost and size of machines shrink, the technology is becoming more prevalent and an inevitable part of a doctor's armamentarium.

Described as the visual stethoscope of the 21st century, POCUS is staging the next revolution in PEM. Although it does not negate the stethoscope, it offers the greater advantage of allowing visualisation of internal organs. Its use in augmenting the paediatric examination has gained traction due to the rapid acquisition of important findings that can assist in critical decision-making and improvement of workplace efficiencies. Furthermore, the real-time information attained increases the understanding of pathophysiology or alternatively safeguards needle-guided procedures at the bedside. However, we are still at the beginning of finding POCUS applications in paediatrics that can replicate the efficiencies shown in adult emergency, such as reducing patient length of stay.

PEM POCUS is still in its infancy in Australasia. Consequently, specific training is ad hoc, with currently no dedicated training pathway or fellowship. Current credentialing has been generalised from adult POCUS training, such the modules within the Certificate in Clinician Performed Ultrasound (CCPU) or the emergency medicine Diploma of Diagnostic Ultrasound (DDU) qualifications offered by the Australasian Society for Ultrasound in Medicine (ASUM), the peak ultrasound body in Australasia. Without a doubt, North America is leading the charge. Toronto, the capital of Ontario, is the most populous city in Canada and the 4th largest city in North America. It has been described as the multicultural and cosmopolitan city of the world. The Hospital for Sick Children, otherwise known as "SickKids", is a quaternary hospital in Toronto that services a population of almost 5 million. It is the world's second largest hospital-based paediatric

research facility, only behind Boston Children's Hospital. It is also renowned for pioneering milk pasteurisation, discovery and clinical trial of insulin, and cystic fibrosis gene discovery.

Founded in 2011, P2SK (short for "PEM POCUS SickKids") at the Hospital for Sick Children, Toronto is a world leader in the clinical application of point-of-care ultrasound in paediatric emergency medicine. Their audacious goal, emboldened on their website, is "to positively impact the quality of care of 1 billion children globally through the use of POCUS by 2020". To this end, their pursuit of this goal has been through their innovative use of social media in conjunction with their P2SK Trainership program. Their website and frequent video blogs has a far reaching audience, which has placed them on the world stage. Their Trainership attracts local and international interdisciplinary trainees and physicians, and offers structured mentoring, insight into their academic program and access to their online learning package.

I underwent a 4-week P2SK Trainership, with the objective of enhancing my POCUS knowledge and skills and to use what was learnt to inform and assist in the development of PEM POCUS credentialing in Australasia. Access was provided to their learning modules, including cardiac, lung, soft tissue and extended focussed assessment with sonography in trauma (EFAST), along with a textbook of case studies. The initial week was comprised of scanning shifts with the ultrasound fellows, and subsequent weeks involved conducting independent scanning, mentored by expert ultrasound emergency physicians. Besides the modules, specific applications were taught, such as intussusception, testicular torsion, hip joint and ocular examination. There was participation in their academic program, including their weekly journal club. Insight was also provided on how to establish a PEM POCUS program including administration, leadership, credentialing and collaboration with other departments.

This unique opportunity has helped me attain proficiency in PEM POCUS and insight into establishment of a program. As aforementioned, POCUS is currently an underutilised tool in paediatric emergency and, in my opinion, should be considered part of a standard skill set, incorporated within PEM training. It is my prediction that PEM POCUS will continue to advance globally, with Australia closely following. With these newly acquired and consolidated skills, I hope to be a part of the revolution, and to train others in the application of PEM POCUS in my current and future work environments, and assist in the development of paediatric specific credentialing as the next step forward.

PROJECT AIMS / OBJECTIVES

- Attainment of proficiency in PEM POCUS for a variety of common applications:
 - I was credentialed in the modules of cardiac, lung, soft tissue and EFAST, with completion of the online materials and required number of scans.
 - I became more proficient in other specific applications such as appendicitis, intussusception, hip joint, testicular torsion and ocular
 - Developed a greater understanding of ultrasound physics/knobology
- Ability to establish a PEM POCUS program
 - A framework was provided, demonstrating how the POCUS program was established at SickKids
- Insight to inform and guide paediatric specific credentialing in POCUS eg Certificate in Clinician Performed Ultrasound modules
 - I have already provided feedback to the Australasian Society for Ultrasound in Medicine (ASUM) who are looking at implementing these CCPU changes. Similar insights may be used to guide the development of a PEM specific Diploma of Diagnostic Ultrasound (DDU)
- Involvement in the PEM POCUS academic program

- Attendance at weekly journal club, image review/discussion for quality-assurance
- Publications
 - Editorial/review article on PEM POCUS applications being currently drafted
- Knowledge Translation
 - Meet with directors of emergency, radiology and cardiology to discuss interface of PEM POCUS
 - Presentations at PEM consultant and fellow meetings, hospital wide presentations eg Grand rounds

SIGNIFICANCE AND OUTCOMES

These opinions expressed are of my own:

- It is inevitable that ultrasound will become a standard part of medical training, with paediatrics no exception.
- PEM credentialing in Australasia is the next step in advancing PEM POCUS.
- Once a critical mass of PEM POCUS proficient clinicians is attained, it would allow more ubiquitous training.