

Spotlight on Joshua Brooks



Joshua Brooks is a 2nd year UQ-Ochsner student interested in paediatric critical care medicine. Josh was the lead author on a research grant from the Intensive Care Foundation. Having worked previously in bench science, biotechnology and as a writer, he came back to medicine after pursuing a Master's in Public Health at Columbia University Mailman School of Public Health.

Specialising in epidemiology and global health, he completed his practicum in Nkoranza, Ghana. After graduating, Josh returned to Ghana as the program officer and project manager for the non-governmental organisation sidHARTe (Systems Improvement at District Hospitals and Regional Training of Emergencies) managing the randomised clinical CPAP (continuous positive airway pressure) Survival Study.

Pneumonia, sepsis and severe malaria kill over two million children under 5 years of age per year and many of these patients can present with acute respiratory distress. In a rural hospital emergency ward, where ventilator support is limited, the CPAP Survival Study sought to determine whether low-cost, low-tech, non-invasive CPAP machines could reduce mortality at two weeks among children under five years old presenting with acute respiratory distress.

Working in the emergency ward with his mentor and principal investigator, Dr. Patrick T. Wilson, and the strong team of local Ghanaian nurses and doctors, Josh was inspired to return to pursue his medical degree. Over the last two years, Josh has worked with Dr. Andreas Schibler, the LCCH PICU team and PCCRG to continue conducting critical care research through the SAP Study.

Following their presentation at the 41st ANZIC/ACCCN Intensive Care ASM and the 22nd Annual Paediatric and Neonatal Intensive Care Conference, UQ-Ochsner medical student **Joshua Cushing Brooks**, **Dr. Andreas Schibler** and the **Paediatric Critical Care Research Group** (PCCRG) were awarded the **Fischer & Paykel Healthcare Research Grant** by the **Intensive Care Foundation** to support their ongoing clinical research project, Saturation Accuracy in Paediatrics (SAP) study.

The conference presentation, "In Probes We Trust? Saturation Accuracy Between Two Oximeter Probes and Arterial Blood Gas in a Paediatric Intensive Care Unit (PICU)" detailed

an analysis of preliminary critical care data from Lady Cilento Children's Hospital (LCCH) Paediatric Intensive Care Unit (PICU).

Every year the Intensive Care Foundation seeks high quality research projects and awards over \$3 million in Research Grants to fund projects aimed at saving lives.

About the Study

The SAP Study was started as a collaborative effort between Joshua Cushing Brooks, Dr. Andreas Schibler, the Paediatric Critical Care Research Group (PCCRG) and the entire nursing and medical staff at the LCCH PICU.

Pulse oximeters are a cornerstone of patient monitoring in the PICU. Using transmittance of two wavelengths of light absorbed by deoxygenated and oxygenated haemoglobin, pulse oximeters allow the measurement of continuous transcutaneous oxygen saturation (SpO₂).

Day in and day out, PICUs rely on pulse oximeters for patient monitoring. However, factors such as poor perfusion, reduced pulsatility and hypoxemia—all common characteristics of children in the PICU—may affect SpO₂ accuracy.

The ongoing SAP Study aims to compare nurse-validated SpO₂ values from two commonly used probes, the Masimo LCNS and the Nellcor probe, to arterial blood gas (SaO₂) samples, in order to determine the saturation ranges, patient characteristics and disease states, in which SpO₂ should or should not be trusted.

The SAP study plans to assess SpO₂ accuracy in specific patient diagnostic groups, such as:

- Congenital heart disease (non-cyanotic), pre- and post-bypass
- Cyanotic heart disease, pre- and post-bypass
- Acute respiratory failure – intubated, ventilated and O₂ requirement > 40%
- Septic shock
- Low cardiac output

Ultimately, the SAP study intends to influence improvement of pulse oximeter algorithms, inform more accurate patient care and, indirectly, better patient outcomes. Grant support from the Intensive Care Foundation will facilitate completion of the project and continued critical care improvement.