

**PO-0344 DEVELOPMENT OF A PAEDIATRIC MODEL TO MIMIC REDUCED CUTANEOUS BLOOD FLOW: VALIDATION USING LASER DOPPLER AND PHOTOPLETHYSMOGRAPHY**

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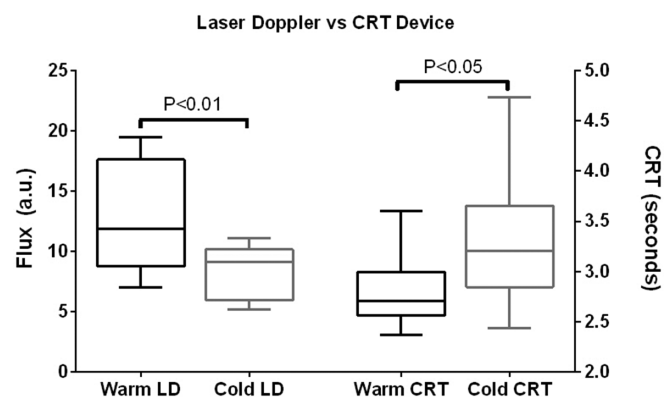
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**Background** Skin blood flow is highly variable accounting for 5–33% of cardiac output (Kenny 2011), and is often one of the first organs to change during early shock. In children, capillary refill time (CRT) is a crucial component of cardiovascular assessment and, despite marked variability, it remains a useful predictor of significant illness in children (Tibby 1999, Craig 2010). To allow development of new technologies to assess cutaneous blood flow a simple but valid model of reduced perfusion is required.

**Aims** 1) Develop an acceptable paediatric model for reduced cutaneous perfusion, 2) Assess the ability of laser Doppler (LD) and green light photoplethysmography (gPPG) to detect these changes.

**Participants and methods** Healthy children (5–17 years) were recruited. Simultaneous forearm LD blood flow and gPPG CRT measurements were obtained at baseline (room temperature) and during localised cooling of the arm (4°C microenvironment). gPPG CRT was measured using a reflectance mode gPPG coupled with an automated pressure application system.

**Results** Ten children completed the study over a typical time-frame of 45 min. Median LD blood flow decreased significantly from baseline during the cold exposure ( $P < 0.01$ ) whilst gPPG CRT increased ( $P < 0.05$ ) (see Figure).



Abstract PO-0344 Figure 1

**Conclusion** This model appears to be both feasible and acceptable to children. Confirmation of reduced blood flow is observed using LD. Our automated CRT utilising gPPG appears useful in this model. After additional validation, the suitability and usefulness of automated CRT could be assessed in paediatric clinical trials with a view to improving recognition of early shock.

**PO-0345 MANAGEMENT OF RETRIEVED PATIENTS WITHIN A PAEDIATRIC EMERGENCY DEPARTMENT**

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**Background/aims** The Victorian Paediatric Emergency Transport Service (PETS) transports critically unwell children from referring to tertiary paediatric hospitals. One-third are dropped in Emergency Departments (ED), rather than ICU (with the intended destination a general ward). The Australian government dictates that patients stay less than 4 h in ED. We describe this cohort's clinical care needs and process measures.

**Methods** A retrospective chart review of patients retrieved by PETS to the Royal Children's Hospital (Melbourne, Australia) ED in 2012. Demographics, illness type and parameters, process measures are related to ED length of stay (LOS) and time to ward-readiness (time at which physiological parameters stabilised and intensive treatments ceased).

**Results** In 2012, 120 patients were transported to the ED. Diagnoses included asthma (22), seizures (19), croup (15) and bronchiolitis (14). The median ED LOS was 4.8 h (IQR 2.9,7.7). On arrival, 73 (60.8%) were ward-ready, but only 31 (26%) were transferred to the ward within 4 h. 25 (20.8%) patients stayed longer than 8 h in ED. 25 (20.8%) had abnormal vital signs after 4 h of ED care. Lower respiratory tract disease (asthma, bronchiolitis and pneumonia) and derangement of physiological criteria on ED arrival were both associated with prolonged LOS and delayed ward readiness.

**Conclusions** Most retrieval patients stay too long in the ED. Administrative delays (primarily access block) is the dominant factor, however patients with asthma and bronchiolitis tend to stay longer and require longer periods of ED-based intensive treatment. This can be used to improve pre-arrival coordination and decision-making.

**PO-0346 REVIEW OF LIFE THREATENING LARYNGOSPASM, AS AN ISOLATED SYMPTOM OF EPILEPSY**

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**Background** Severe laryngospasm, as a presenting symptom of epilepsy in children, is very uncommon and often misdiagnosed. To increase awareness, we present a literature review. The incentive was a 22 month old girl who presented with life threatening laryngospasm. The choking episodes progressed rapidly to frequent unprovoked episodes day and night; associated with severe oxygen desaturation, whilst being fully aware and requiring paediatric intensive care interventions. Initially, investigations did not confirm a diagnosis of epilepsy. Repeat video EEG finally demonstrated cortical seizures, with focality over the right posterior temporal region. To achieve seizure control, high doses of carbamazepine and levetiracetam were necessary. Interestingly, the patient shares neurological features with family members, suggesting a genetic link.

**Methods and results** A literature review shows that the extent of epileptic laryngospasm in this case report has not previously been described amongst only 9 related case reports. Reviews concerning choking episodes during sleep debate a diagnostic challenge that stems from the frequent absence of recorded epileptiform activity, often causing a delay in adequate seizure treatment. Two recent reports on severe neonatal episodic laryngospasm describe a new phenotype of seizure disorder related to sodium channelopathy. In these patients, high dose carbamazepine was necessary to achieve seizure control.