LATE-BREAKERS: Wednesday 8th June (1:00 – 3:00 pm)

Chairs: Drs P Kochanek & RC Tasker

In this session we were privileged to have five clinical investigators at the forefront of gaining new knowledge in the field of pediatric critical care medicine. These presenters covered the range of stages in a clinical investigation program. **Dr Parshuram** discussed his group's protocol for a cluster randomized controlled trial (RCT) about the processes of early warning assessment during the care of hospitalized children that is soon to be completed. Two other speakers talked about recently published RCTs in pediatric critical care: **Dr Nadkarni** reviewed the results of the targeted temperature management RCT after out-of-hospital cardiac arrest; and, **Dr Mok** talked about the RCT of impregnated central venous catheters for prevention of bloodstream infection. The remaining two presenters reported on new articles appearing in the June 2016 issue of *Pediatric Critical Care Medicine*. Both articles describe studies that examine pre-intensive care unit admission factors related to outcome. **Dr Mateev** talked about systems-level improvement in pre-admission care in the Emergency Department using telemedicine and **Dr Giuliano** talked about severity-of-illness in sepsis in Europe and USA.

Parshuram CS et al. (2015) Evaluating processes of care and outcomes of children in hospital (EPOCH): study protocol for a randomized controlled trial. Trials 16:245. **Dr Parshuram** talked about the soon to be completed EPOCH cluster-randomized trial of the *BedsidePEWS*. Randomization is to either *BedsidePEWS* or control (no severity of illness score) in a 1:1 ratio. All-cause hospital mortality is the primary outcome. The study should be finished in July 2016 and the results will impact on healthcare delivery, whether positive or negative. In summary:

- The objectives of EPOCH are to evaluate the impact of the *BedsidePEWS* on early identification of children at risk for near and actual cardiopulmonary arrest, hospital mortality, processes of care and ICU resource utilization.
- The hypothesis is that *BedsidePEWS* improves early detection of critical illness, reduces mortality, improves processes of care and does not increase healthcare resource utilization.

Moler FW et al. (2015) Therapeutic hypothermia after out-of-hospital cardiac arrest in children. N Engl J Med 372:1898-908. **Dr Nadkarni** presented and discussed the results of the pediatric *Targeted Temperature Management* (TTM) trial. This study reported management with temperature ranged either hypothermic, or closer to normothermia, yet avoiding fever and pyrexia. The TTM trial was not a study of 33°C versus "usual care" in that both groups had active temperature management. The focus of Dr Nadkarni's presentation was on issues that may have resulted in a "negative" trial. For example:

- Post-cardiac arrest care protocols involve much more than just "temperature range" management. It includes attention to all the parameters of intensive care: cardiovascular with attention to blood pressure and hemodynamics; neurological with attention to level of sedation, paralysis and use of neuromuscular blockade, and treatment of seizures and the use of continuous electroencephalography; respiratory support and monitoring of mechanical ventilation; and general care including nutrition and glycemic control. So, although the focus is TTM, the intensity of intensive care and associated management of these other parameters may be influenced by the enrollment in a trial of this sort. And, thus, the attention to the detail of intensive care may also influence the quality of care in the "control group", such that differences between groups are lessened.
- Although the trial must be acknowledged as a "negative trial in regard to the primary outcome, interpretation of this study as completely "negative" in regard to an individual patient admitted to the ICU after out-of-hospital cardiac arrest is challenging. The limited power to detect a potentially clinically important difference in survival and functional outcome leads to more questions about timing, intensity, and duration of cooling for post-cardiac arrest patient care. Thus, this "negative" study, does not suggest that there is harm from inducing therapeutic hypothermia to 33°C. Rather, there may be some potential that specific patient populations might (in the future) benefit from therapeutic hypothermia.

Gilbert RE et al. (2016) Impregnated central venous catheters for prevention of bloodstream infection in children (the CATCH trial): a randomsed controlled trial. Lancet 387:1732-43. **Dr Mok** presented the results of the recently published CATCH trial:

- Use of antibiotic-impregnated central venous catheters (CVC) was associated with a lower rate of blood stream infection (BSI) when compared to use of standard and heparin-bonded CVCs.
- Antibiotic-impregnated CVCs are cost effective when considering the savings associated with

averting BSIs, even when the BSI rate is low.

- Use of so-called "deferred consent" in patient recruitment is acceptable to parents only if the intervention is safe.

Dayal P et al. (2016) Impact of telemedicine on severity of illness and outcomes among children transferred from referring emergency departments to a children's hospital PICU. Pediatr Crit Care Med 17:516-21. Dr Mateev described her collaboration's "late-breaking" work that is published in the June 2016 issue of *Pediatric Critical Care Medicine*. In summary:

- Children transferred from emergency departments (EDs) where telemedicine is used arrive to the PICU less sick than those from EDs without telemedicine capabilities.
- In light of potentially better outcomes, as implied by lower standardized mortality ratios for children in EDs with telemedicine availability, telemedicine should be considered as an adjunct tool for EDs without access to pediatric expertise.

Giuliano JS Jr et al. (2016) Comparison of pediatric severe sepsis managed in US and European ICUs. Pediatr Crit Care Med 17:522-30. Dr Giuliano described his group's "late-breaking" work that is published in the June 2016 issue of *Pediatric Critical Care Medicine*. In summary:

- Children with severe sepsis appear to be at a "sicker" stage of illness when entering a pediatric intensive care unit (PICU) in Europe, as compared to such children entering a PICU in the USA.
- After adjusting for potential confounders, the differences in morbidity and mortality are not statistically significant.