A New Challenge For Nursing Staff - Spontaneous Breathing Infants with VV ECMO

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Introduction
Extracorporeal Membrane Oxygenation (ECMO) therapy has been available in our Children’s Hospital for children with organ failure treated with or without cardiac surgery. Analgosedation and ventilation is used during ECMO therapy. Presently we are attempting to reduce the level of analgosedation and, for patients with good lung function, early extubation. This change in procedures has created new challenges in caring for these patients.

Methods and Patient Sample
A literature review highlighted the newest evidence in ECMO therapy for children. We tried early analgosedation reduction with two infants. A 2-month old boy born with a hypoplastic left heart syndrome was admitted to the pediatric intensive care unit (PICU) after a Glenn Procedure. An oxygenation problem developed due to small pulmonary vessels and ECMO therapy was started. His condition stabilized and he was extubated during ongoing VV-ECMO therapy.
A 5-month old boy with Kawasaki Syndrome was admitted to the PICU following cardiac arrest and resuscitation. ECMO therapy was initiated. Following hemodynamic stabilisation, an LVAD was installed using the ECMO circuit. The child was extubated soon after.

Results
Extubation required a rapid reduction in analgosedation, but resulted in agitation in both infants. The 2-month old had periods of uncontrollable agitation unreactive to verbal or physical comforting. He randomly grabbed catheters and cannulae, negatively affecting the ECMO flow. One-on-one care was initiated, but atelectasis of the right upper lobe developed due to the difficulty with mobilization caused by ECMO cannula placement. Mobilization of the 5-month old was easier due to the type and placement of the cannulae. He was alert, active and could be mobilized, therefore muscle wasting was reduced and lung volume increased. Extubation had a positive effect on the circulation. Less catecholamine was used, nutrition optimized, and elimination normalized.

Conclusion
Early extubation positively influences the circulatory status and is recommended. To achieve this in infants who are breathing spontaneously, analgosedation must be adequate and optimal cannulae placement critical.
Enabling the provision of one-on-one care is advised and parents can be supported to help care for their infant.