



Central California Pediatrics

DECEMBER 2022

Specialty information for physicians who treat children and expectant mothers.



Follow Up After Neonatal or Pediatric Extracorporeal Life Support (ECLS)

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What is ECLS?

Extracorporeal life support (ECLS) or extracorporeal membrane oxygenation (ECMO) is a temporary life support modality used in neonates and children with profound heart or lung failure. ECLS is very different from other critical care modalities in its complexity, invasiveness and intensity. In general, ECLS may be applied to patients with potentially reversible organ failure who have greater than 80% risk of mortality. Many life-threatening conditions may potentially benefit from ECLS, such as meconium aspiration, acute respiratory distress syndrome, bronchiolitis, myocarditis and sepsis. Currently, we are also seeing an increase in ECLS use during the present respiratory viral pandemic.

Follow Up After ECLS Hospitalization

Survivors of critical illness, including those sick enough to require ECLS, have significant medical, developmental, social, emotional and physical needs. They require both short and long-term follow-up care. If these concerns are not appropriately identified and managed, they may evolve over time into significant long-term neuropsychologic sequelae with wide-ranging implications for the health, education and integration of these children into society. It is estimated that 25-40% of ECLS survivors have neuropsychologic deficits that have a potential to impact later life-skill performance. The magnitude of any impairment may not initially be apparent, but becomes evident as children grow and are expected to acquire higher order executive brain functions. There are different tools to test neuropsychologic status at different ages, evaluating development, neurologic function, language and social skills, school readiness and other cognitive function.

Initial evaluation before hospital discharge should include a brain MRI (or CT), neuropsychology consultation, nutritional assessment and physical, occupational and/or speech therapy. Family education and a plan for follow up care related to associated medical conditions will also occur.

After hospital discharge, patients should be referred to high-risk infant follow up clinic (3 years or younger) or neuropsychiatry (4 years and older), audiology and ophthalmology. Ongoing growth and nutritional assessments plus general pediatric care are important.

- If there is abnormal neuropsychiatric evaluation before discharge, initial follow up should be within 2 months, with subsequent follow up as recommended by the neurodevelopmental specialist.
- If the patient has no significant neuropsychiatric concerns at time of discharge:
 - Infants and children 4 year and younger should be seen 4-6 months after discharge, then re-evaluated at ages 1, 2, 3 and 5 years of age, then every 2-3 years through early adulthood.
 - Children 4 years and older should be seen at 6 and 12 months after discharge, then every 2-3 year through early adulthood.

School Entry

Although most ECLS patients will have average intelligence when they enter kindergarten, they remain at increased risk for specific and subtle cognitive deficits that may affect school performance; these may be missed by routine kindergarten screening. Therefore, a complete cognitive evaluation by a clinical psychologist or neuropsychologist is recommended prior to school entry. Law mandates that

public schools provide a free and appropriate educational program for each child. Intervention services for deficits that interfere with academic functioning can include speech, language or occupation therapy. Parents can obtain information about their rights regarding special education services from the California Board of Education.

School Age Children into Adulthood

Although most survivors of critical illness and ECLS initially may appear to have good neurodevelopmental outcomes, some issues only become evident as the child grows and their brain function needs to become more complex as adults. Therefore, it is recommended that children who had ECLS continue to be followed into adulthood and evaluated for areas where difficulty may arise, thereby offering the opportunity for early intervention and treatment. After ECLS, areas where older children may develop problems include:

- Cognitive or thinking abilities
- Attention or executive functions
- Behavior or mood difficulties
- Speech, language and communication skills
- Motor function (movement and coordination)
- School achievement
- Learning and memory
- Adaptive function
- Ability to form relationships
- Quality of life

Ranked Among the Best in the World for ECLS

Valley Children's ECLS program is a Designated Platinum Center of Excellence in Life Support by the Extracorporeal Life Support Organization (ELSO). With ECLS survival rates in the top 10-15% in the world, our program is committed to providing safe and effective care to improve the health of our patients. Our ECLS program is one of only two children's hospitals in the Western U.S. with a Platinum designation. We have achieved this distinction with a strong focus on safety. Since 2016, our ECLS complication rates per 1,000 run-hours are only one-third of the average ELSO center. As the only neonatal or pediatric ECLS center in the Central Valley, Valley Children's is dedicated to the continued development, evaluation and improvement of ECLS and other innovative therapies for the support of failing organ systems. **For more information, contact: ecmo@valleychildrens.org.**



Medical Staff News

The following pediatric specialists recently joined Valley Children's:

Critical Care Medicine

Tom La Rocca, MD

Hospitalists

Jennifer Case, MD

Jeevcarathnam Pacha Dharma, MD

Pediatric Surgery

Omar Nunez Lopez, MD

Primary Care

(Dakota Pediatrics)

Patricia Clarke, MD

(Magnolia & Kaweah/In-House: ER)

Gohar Ashraf, MD

Upcoming CME Opportunities

Grand Rounds:

Translating your Educational Efforts into Scholarship

Presented by Teri Turner, MD, MPH, MEd

Tuesday, January 10

12:15 p.m. - 1:15 p.m.

Pediatric Clinical Symposium: Genetics

Presented by Mark Nunes, MD

Wednesday, January 25

12:15 p.m. - 1:15 p.m.

ACEs and Trauma-Informed Care: Turning Awareness into Action (2-Part Series)

Presented by David M. Lockridge, Executive Director at ACE Overcomers

Wednesday, February 1 and February 8

12:15 p.m. - 1:15 p.m.

Register for Valley Children's CME events through our CME Tracker, cmetracker.net/VCH