



Topic Brief: Pediatric Acute Respiratory Distress Syndrome

Date: 1/7/2020

Nomination Number: 0913

Purpose: This document summarizes the information addressing a nomination submitted on June 17, 2020 through the Effective Health Care Website. This information was used to inform the Evidence-based Practice Center (EPC) Program decisions about whether to produce an evidence report on the topic, and if so, what type of evidence report would be most suitable.

Issue: This topic was nominated by representatives from the Pediatric Acute Lung Injury Consensus Conference Group (PALICC), an international panel of experts convened to support an update their 2015 clinical practice guideline for the diagnosis and management of Pediatric Acute Respiratory Distress Syndrome (PARDS).

Program Decision: In the process of communicating with the nominator, it was determined that the requested timeline for developing a new systematic review was not feasible. As such, the nominator opted to withdraw the nomination at this time, and will consider resubmitting this topic ahead of their future guideline updates. Accordingly, the EPC program will not develop a new evidence review for this topic.

Background

Acute respiratory failure is the most common medical emergency in children and is a significant cause of pediatric mortality. Respiratory failure, broadly defined as the inability to maintain sufficient oxygenation to meet the body's metabolic demand, can be caused by a broad range of pulmonary, cardiac, and other conditions. Pediatric Acute Respiratory Distress Syndrome (PARDS) is a manifestation of acute lung injury, commonly caused by severe pulmonary infections, trauma, or sepsis, and accounts for up to 10 percent of annual pediatric intensive care unit (PICU) admissions.²

The historic characterization of PARDS was based on the definition of adult acute respiratory distress syndrome and did not consider significant differences in respiratory physiology of children and adults. As a result, treatment recommendations for PARDS were derived from treatment strategies evaluated and used only in adults, which resulted in significant underdiagnosis and variability of care. The lack of evidence-based guidance for the management of PARDS prompted an international panel of experts to convene the Pediatric Acute Lung Injury Consensus Conference (PALICC) in 2015 to establish a pediatric-specific definition and treatment guidelines for PARDS.²

The 2015 PALICC guidelines contain nine sections, each summarizing expert consensus regarding: 1) definition, prevalence, and epidemiology; 2) pathophysiology, comorbidities, and severity; 3) ventilatory support strategies; 4) pulmonary-specific ancillary treatment strategies; 5) non-pulmonary treatment strategies; 6) clinical monitoring; 7) noninvasive support and ventilation strategies; 8) extracorporeal membrane oxygenation (ECMO) strategies; and 9) screening strategies to decrease morbidity and optimize long-term outcomes in children recovered from PARDS.³ At present, PALICC is reconvening to establish a comprehensive update of these guidelines to reflect more recent evidence.

Related Resources

We identified additional information in the course of our assessment that might be useful to the nominator. Specifically, we found two systematic reviews published within the past five years, and 15 primary studies published within the past three years pertaining to different subsections of the 2015 PALICC guideline. These publications are listed below and are organized by relevant subsections of the PALICC 2015 guidelines.

- **PARDS Definition, Prevalence, and Epidemiology (Section 1):** We found two systematic reviews and four observational studies addressing the incidence of PARDS and its associated mortality.⁴⁻⁹
- **PARDS Pathophysiology, Comorbidities, and Severity (Section 2):** We found two observational studies evaluating the utility of two risk stratification tools to evaluate mortality risk and PARDS.^{10, 11}
- **Ventilatory Support Strategies (Section 3):** We found three primary studies evaluating the effectiveness of different mechanical ventilation strategies recommended for management of PARDS.¹²⁻¹⁴
- **Pulmonary and Non-pulmonary Treatments (Sections 4 and 5):** We found three primary studies¹⁵⁻¹⁷ and one secondary analysis of a randomized controlled trial (RCT) data¹⁸ pertaining to different pulmonary-specific and non-pulmonary treatments for PARDS.
- **Clinical Monitoring of PARDS (Section 6):** We found one prospective observational study assessing prognostic relevance of chest imaging in management of PARDS.¹⁹
- **Indications for Extracorporeal Membrane Oxygenation (ECMO) in PARDS (Section 8):** We found one cohort study evaluating the effectiveness of ECMO by comparing ECMO-supported children to pair-matched non-ECMO-supported controls with PARDS.²⁰
- **Morbidity and Long-term Outcomes in PARDS (Section 9):** We found two secondary analyses evaluating factors associated with worse post-discharge function and health-related quality of life in children with PARDS.^{21, 22}
- **Computerized Decision Support Tools (New section for guideline update):** We found one review article discussing a computerized decision support tool to determine the optimal mechanical ventilation modality which is currently being evaluated as a part of Phase II RCT.²³

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Authors

Irina Arkhipova-Jenkins
Charli Armstrong
Emily Gean

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Christine Chang

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