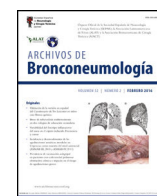




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Clinical Letter

Feasibility and Safety of the Prone Position in Mechanically Ventilated Patients During Pediatric Interfacility Transport

To the Director,

The prone position is a well-established technique in pediatric intensive care units for enhancing oxygenation in severe cases of acute respiratory distress syndrome (ARDS).¹ It has been described in newborn² and adult transport.^{3–5} To the best of our knowledge, there are currently no reports on its application during pediatric interfacility transport.

This case report includes three pediatric infants.

Patient 1 was a 6-month-old female with aspiration pneumonia and meningococcal sepsis.

On the 13th day, she required intubation, mechanical ventilation, inotropic support, analgesia, sedation, and neuromuscular blockade, iNO (inhaled nitric oxide), HFV (high frequency ventilation) and changing the patient to the prone position. Owing to hypoxemia, the referring center considered ECMO (extracorporeal membrane oxygenation) support and requested interfacility transport. Upon arrival at the medical transport team, the patient was transferred to the ambulance stretcher in the prone position without any complications. The transport lasted 14 min, and the patient remained stable. Upon arrival at the PICU, ECMO therapy was initiated 24 h after admission and successfully withdrawn after 16 days.

Patient 2 was a 5-month-old male with a history of prematurity and bronchodysplasia admitted to a tertiary hospital due to bronchiolitis. After 3 days, the patient's condition deteriorated, leading to intubation, inotropic support, aggressive ventilatory measures and prone positioning. The referring center considered ECMO support and requested interfacility transport. At the arrival,

the transport team proceeded to physical transfer to the ambulance stretcher in the prone position. The patient presented an episode of mild hypotension, which resolved after increasing the perfusion of noradrenaline. The ground interfacility transport lasted 67 min with no complications. Upon arrival at the PICU (Fig. 1), the patient remained stable without needing ECMO support. The patient was discharged from the PICU after eight days.

Patient 3 was a 1-year-old male with pneumonia due to *Haemophilus influenzae*. Owing to severe hypoxemia, the referring hospital requested critical care transport to a tertiary hospital. Upon arrival at the medical transport team, the patient was intubated and inotropic support was initiated. Owing to progressive hypoxemia despite aggressive parameters and analgesia, sedation and neuromuscular blockade, prone positioning was performed, and iNO was initiated. The oxygen saturation improved. The transport team proceeded to physical transference to the ambulance stretcher in the prone position. The transport lasted 105 min without complications. Upon arrival at the PICU, ECMO therapy was initiated 36 h after admission and successfully withdrawn after 4 days.

To summarize, the presented cases demonstrate the feasibility and safety of using the prone position in pediatric patients during critical transport. All patients were transported in the ambulance stretcher using a vacuum mattress, and cushions on pressure points.

We suggest considering the prone position during transport for patients with severe ARDS if the patient is hemodynamically stable and under analgesia, sedation, and neuromuscular blockade. Additionally, we emphasize the importance of maintaining stability for at least 30 min after placing the patient in the prone position before physical transference. Implementing prone positioning during transport requires careful planning and skilled execution by specialized medical transport teams.

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Figure 1. Patient 2 on arrival at the referral centre.

Declaration of Generative AI and AI-assisted Technologies in the Writing Process

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Conflicts of Interest

The authors declare not to have any conflicts of interest that may be considered to influence directly or indirectly the content of the manuscript.

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References

1. Fineman LD, LaBrecque MA, Shih MC, Curley MA. Prone positioning can be safely performed in critically ill infants and children. *Pediatr Crit Care Med*. 2006;7(5):413–22, <http://dx.doi.org/10.1097/01.PCC.0000235263.86365.B3> [PMID: 16885792; PMCID: PMC1778461].
2. Pan A, Peddle M, Auger P, Parfeniuk D, MacDonald RD. Interfacility transport of mechanically ventilated patients with suspected COVID-19 in the prone position. *Prehosp Emerg Care*. 2023;27(3):287–92, <http://dx.doi.org/10.1080/10903127.2022.2036882> [Epub 02.03.22: PMID: 35103581].
3. DellaVolpe JD, Lovett J, Martin-Gill C, Guyette FX. Transport of mechanically ventilated patients in the prone position. *Prehosp Emerg Care*. 2016;20(5):643–7,

- <http://dx.doi.org/10.3109/10903127.2016.1162888> [Epub 13.04.16; PMID: 27075163].
4. Flabouris A, Schoettker P, Garner A. ARDS with severe hypoxia – aeromedical transportation during prone ventilation. *Anaesth Intensive Care*. 2003;31(6):675–8, <http://dx.doi.org/10.1177/0310057X0303100613> [PMID: 14719432].
5. Pediatric Acute Lung Injury Consensus Conference Group. Pediatric acute respiratory distress syndrome: consensus recommendations from the Pediatric Acute Lung Injury Consensus Conference. *Pediatr Crit Care Med*. 2015;16(5):428–39, <http://dx.doi.org/10.1097/PCC.0000000000000350> [PMID: 25647235; PMCID: PMC5253180].

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