

## Practice Recommendations for the Physiotherapy in a Pediatric Intensive Care Unit: COVID-19

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Coronavirus is a new virus, the lack of immunity in the population means that COVID 19 has the potential to spread extensively. The current data seem to show that we are all susceptible to catching this disease, which includes, patients and healthcare staff (1).

The COVID-19 in children is often less severe than in adults. It is believed Children were usually well cared for at home and might have relatively less opportunities to expose themselves to pathogens and/or sick patients. The angiotensin converting enzyme II (ACE2) is known as a SARS-CoV-2 /receptor and evidence has indicated that these receptors in children have less maturity and function than in adults. Making children less sensitive to the virus (2-4).

The COVID-19 is a systemic disease that primarily injures the vascular endothelium, according to recently published literature the evaluation of imaging exams of the most severe cases is of great relevance. The typical radiographic image when examining the chest tomography of pulmonar involvement is parenchymal destruction expressed as multiple bilateral ground-glass opacities and pulmonary consolidations. In children with severe infections, multiple lobar lesions may be present in both lungs (5-7).

Caring for children with COVID-19 will require careful

considerations in clinical care, staffing and isolation requirements, and all PICUs should be prepared for these possibilities (8).

The use of non-invasive ventilation and high-flow nasal cannula is recommended in children with mild disease. However, the guidelines suggest use in negative pressure rooms to reduce the risk of droplet aerosolization (8).

In pediatric patients on invasive mechanical ventilation, the use of the Oxygenation Index (OI)  $[(OI = MAP \times FiO_2 \times 100 / PaO_2)]$ , is ideal index for the classification of pediatric ARDS severity. The oxygenation index uses the mean airway pressure (MAP), oxygen fraction ( $FiO_2$ ) and partial oxygen pressure in arterial blood ( $PaO_2$ ). The degree of lung injury is classified as: mild acute respiratory distress syndrome (ARDS) ( $4 < OI < 8$ ), moderate ARDS ( $8 < OI < 16$ ) and severe ARDS ( $OI > 16$ ) (9-14).

The strategy of monitoring and control of drive pressure at values  $\leq 15$   $cmH_2O$  with plateau pressure limited to 28  $cmH_2O$  becomes extremely important. These measures could avoid new damage to an already damaged lung (10-12). Physiotherapeutic assistance to patients diagnosed with COVID-19 must follow four fundamental principles: early identification, isolation, diagnosis and treatment.

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Besides that, it is important to establish and describe the new strategic of work process flow and training step by step the safety of this new process (15-20).

Physiotherapeutic procedures can be considered high risk when they include aerosol-generating, such as: aspiration of the airways, collection of secretion from the upper airways, the aid during of tracheal intubation and cardiorespiratory arrest maneuvers. It is important to remember even direct handling of the patient for positioning, elective tracheal extubation, change of the barrier filters and adjustment/fixation of tracheal tube are procedures of risk (15-19).

It is important to remind that during intensive medical treatment of these patients even using protective pulmonary ventilation, sedation and neuromuscular blockers, this patients are at high risk of developing muscle weakness acquired in the ICU and consequently worsening their morbidity and mortality (20,21).

### Perspectives

At this time, teamwork and collaboration are more important than ever within our own profession and interprofessionality, effective and compassionate communication is essential.

A prepared, motivated and experienced team can directly influence the success of the treatment of COVID-19. The objectives must be well established, with treatment methods based on the best evidence combined with the domain of different technologies. Beyond the acute stage of disease the Physiotherapy will play a important role providing interventions with exercises, mobilization and early rehabilitation. This way, it will be possible to promote a functional recovery for survivors of critical illness associated with COVID-19.

### References

1. Policy paper. Coronavirus action plan: a guide to what you can expect across the UK. Department of Health and Social Care, 2020.
2. XU, Zhe et al. Pathological findings of COVID-19 associated with acute respiratory distress syndrome. *The Lancet respiratory medicine*, 2020.
3. Zimmermann P, Curtis N. Coronavirus Infections in Children Including COVID-19. *The Pediatric Infectious Disease Journal*, 2020;1.
4. Xing Y, Ni W, Wu Q, et al. Prolonged presence of SARS-CoV-2 in feces of pediatric patients during the convalescent phase, 2020.
5. Li W. Chest computed tomography in children with COVID-19

- respiratory infection. *Pediatr Radiol*, 2020.
6. Z, Fu J, Shu Q, et al. Diagnosis and treatment recommendations for pediatric respiratory infection caused by the 2019 novel coronavirus. *World Journal of Pediatrics*, 2020.
7. Marini JJ, Gattinoni L. Management of COVID-19 Respiratory Distress. *JAMA*, 2020.
8. Ong JSM, Tosoni A, Kim Y, Kissoon N, Murthy S. Coronavirus Disease 2019 in Critically Ill Children: A Narrative Review of the Literature. *Pediatr Crit Care Med*, 2020.
9. Barbas C.S.V, et al. Brazilian recommendations for mechanical ventilation 2013. Part I. *Rev Bras Ter Intensiva*, 2014;26(2):89-121.
10. Amato M. B. P. Driving pressure and survival in the acute respiratory distress syndrome. *N Engl J Med*, 2015;372(8):747-755.
11. Georgopoulos D. Driving pressure during assisted mechanical ventilation. *Respiratory Physiology and Neurobiology*, 2016;(8)484-493.
12. Palicc. Pediatric acute respiratory distress syndrome: Consensus recommendations from the pediatric acute lung injury consensus conference. *Pediatr Crit Care Med*, 2015;16(5)428-439.
13. Serpa Neto A. Association between tidal volume size, duration of ventilation, and sedation needs in patients without acute respiratory distress syndrome: an individual patient data meta-analysis. *Intensive Care Med*, 2014;40(7):950-957.
14. Cheifetz I. M. Pediatric ARDS. *Respiratory Care*, 2017;62(6):718-731.
15. Royal College of Paediatrics and Child Health. COVID-19 - Guidance for paediatric services, 2020.
16. Recommendations for physiotherapeutic management in the context of urgency and emergency in patients with COVID-19. Technical note from the technical chamber of physiotherapy in urgency and emergency of the regional council of physiotherapy and occupational therapy in rio de janeiro (CREFITO-2), 2020.
17. Martinez, B. P. et al. COVID-19: Physiotherapist's role in different performance scenarios. *ASSOBRAFIR*, 2019.
18. Aspectos Epidemiológicos e Atuação Do Fisioterapeuta Na Prevenção e Tratamento da COVID-19 Na População Infantil Em Ambiente Hospitalar – Assobrafir, 2019.
19. Namendys-Silva S.A. Respiratory support for patients with COVID-19 infection. *Lancet Respir Med*, 2020.
20. Kress JP, Hall JB. ICU-acquired weakness and recovery from critical illness. *N Engl J Med*, 2014;370(17):1626–1635.
21. Herridge MS. Functional disability 5 years after acute respiratory distress syndrome. *N Engl J Med*, 2011;364(14):1293–1304.