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# Critical Rounds

MICRO LABS LIMITED

**Dear Doctor,**

**Greetings from Micro Labs limited. We are happy to bring "CRITICONNECT" containing latest information in the field of Critical care medicine.**

## Inside This Issue


- Point-of-Care Ultrasonography (POCUS) of Lungs in COVID19 **1**
- Tracheostomy practice and timing in traumatic brain-injured patients: a CENTER-TBI study **4**
- A Multicenter Point Prevalence Study of Critically Ill Children's Physical Rehabilitation **6**


Should you require any specific article or medical information, please feel free to contact us at medicalservices@microlabs.in

Looking forward to your valuable feedback

Best Regards,
Medical Team, Micro Labs Ltd

# Point-of-Care Ultrasonography (POCUS) of Lungs in COVID19

### INTRODUCTION

Ultrasonography at the point of care (POCUS) is a relatively new technology that has evolved considerably in the last decade. The advantages of POCUS, particularly during the COVID-19 pandemic, include user-friendliness, bedside quality, shift avoidance and likely even virus spread, less burdensome disinfection, and lower standards for staff and personal protective equipment (PPE). An ultrasonic examination of multiorgan bedside may determine the severity of the disease and can recommend an alternate treatment for clinical presentation.

Chest computed tomography (CT) remains the best available tool for determining lung parenchymal activity in COVID-19 patients (see COVID-19: Machine tomography). As lung changes tend to be distributed along the pleura in these patients, lung ultrasonography has high sensitivity and the findings are correlated with peripheral thoracic CT findings.

It should be remembered that all imaging modalities used in COVID-19 cases, including chest x-ray, ultrasonography of the heart, and chest CT, lack precision. The findings outlined in this chapter may be due to a number of other etiologies, including other infectious causes such as various viral infections (e.g., influenza, respiratory syncytial virus) and other forms of atypical pneumonia, or inflammatory conditions. Viral examination conducted in patients with clinical COVID-19 concern is the most reliable screening tool and the lack of results in the imaging tests will not preclude the condition. The imaging methods provide additional information which can be integrated in the clinical context.

## LUNG ULTRASONOGRAPHY

### Ultrasound Findings

Lung ultrasound findings in patients with COVID-19 include:

1) A line

2) Thickening of the pleural line with pleural line irregularity

3) B lines in a variety of patterns, including focal (patchy), multifocal, and confluent

4) Consolidations, including nontranslobar, translobar, and dynamic air bronchogram

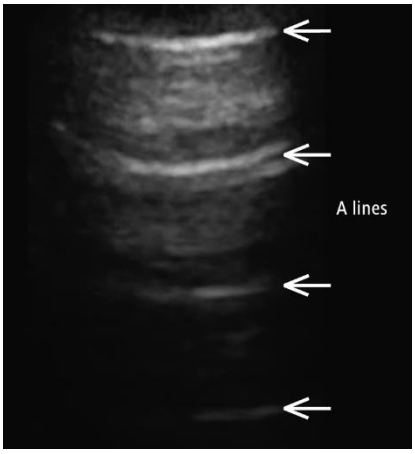
5) Pleural effusions are uncommon

Lung ultrasound findings described in different stages of COVID-19:

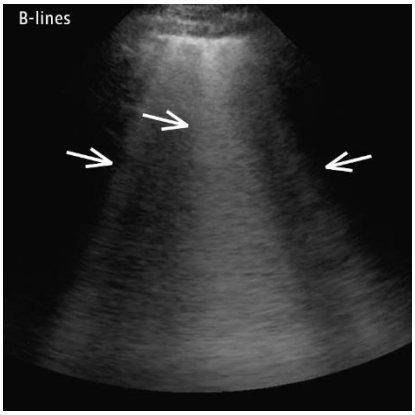
1) Early or mild disease: Focal patchy B lines.

2) Progressive disease: Alveolar interstitial syndrome (multifocal or confluent B lines).

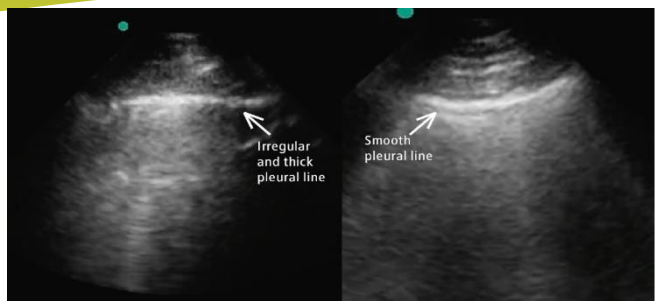
3) Convalescence or recovery phase and very early presentation: A lines




**A-line pattern, which suggests normal aeriation of the lung and corresponds to a normal chest radiograph. A line is a repetitive reverberation artifact of the pleura.**




**Multiple B lines (arrows) with confluent B lines (middle arrow). B lines are well-defined, vertical, hyperechoic, dynamic artifacts originating from the pleural line and extending to the bottom of the screen. Patchy or focal B lines is a description based on examination of 8 to 12 lung points.**




**Comparison between a smooth pleural line (cardiogenic pulmonary edema; right arrow) and a thick irregular pleural line (COVID-19; left arrow). Of note, there are B lines in both images.**

Source: Alaifan T. COVID-19: Point-of-Care Ultrasonography (POCUS). McMaster Textbook of Internal Medicine. Kraków: Medycyna Praktyczna. https://empendium.com/mcmtextbook/chapter/B31.1269.2 Accessed May 18, 2020.

# Tracheostomy practice and timing in traumatic brain-injured patients: a CENTER-TBI study


## INTRODUCTION

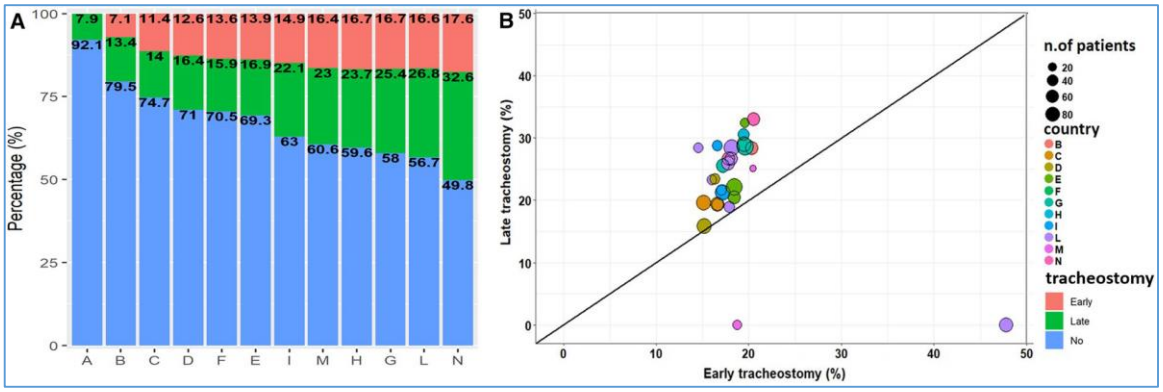
Tracheostomy may promote weaning in long-term ventilated patients, theoretically shorten the duration of stay in the mechanical ventilation and intensive care unit (ICU), and mitigate complications induced by extended tracheal intubation, such as ventilator-associated pneumonia (VAP) and tracheal lesions. The main indications for tracheostomy in patients who require ICU care after a TBI include failure to wean invasive mechanical ventilation, lack of protective airway reflexes, impairment of respiratory drive, and difficulty in managing secretions. The proportion of TBI patients that might gain from a tracheostomy and the most suitable timing for the operation are still unclear, and the related prejudices complicate the limited evidence available on this problem, mostly retrospective. In addition, policies and clinical protocol vary across various institutions, and the appropriate tracheostomy guidelines remain unknown. Tracheostomies performed in the first week are conventionally graded as early, whereas tracheostomies performed later than seven days are described as late. The ideal timing for a tracheostomy is uncertain since there is conflicting evidence on the advantages of early over late tracheostomy, and no real mortality differences have been identified so far between early and late tracheostomy. To obtain insights into tracheostomy in patients who had suffered a TBI, the data was analyzed from the ICU stratum of the CENTER-TBI study. This research aims to characterize the characteristics of certain TBI patients undertaking a tracheostomy and the current condition of their scheduling; to define the variables involved in conducting the operation and the various approaches between countries, and to determine the effect of the scheduling on the result of the patients.

## METHODS

TBI patients were selected from CENTER-TBI, a prospective observational longitudinal cohort study, with an intensive care unit stay ≥ 72 h. Tracheostomy was defined as early (≤ 7 days from admission) or late (> 7 days). Cox regression model was used to identify critical factors that affected the timing of tracheostomy. The outcome was assessed at 6 months using the extended Glasgow Outcome Score.

## RESULTS

Of the 1358 included patients, 433 (31.8%) had a tracheostomy. Age (hazard rate, HR = 1.04, 95% CI = 1.01– 1.07, p = 0.003), Glasgow coma scale ≤ 8 (HR = 1.70, 95% CI = 1.22–2.36 at 7; p < 0.001), thoracic trauma (HR = 1.24, 95% CI = 1.01–1.52, p = 0.020), hypoxemia (HR = 1.37, 95% CI = 1.05–1.79, p = 0.048), unreactive pupil (HR = 1.76, 95% CI = 1.27–2.45 at 7; p < 0.001) were predictors for tracheostomy. Considerable heterogeneity among countries was found in tracheostomy frequency (7.9–50.2%) and timing (early 0–17.6%). Patients with a late tracheostomy were more likely to have a worse neurological outcome, i.e., mortality and poor neurological sequels (OR = 1.69, 95% CI = 1.07–2.67, p = 0.018), and longer length of stay (LOS) (38.5 vs. 49.4 days, p = 0.003).




**Left panel (a). Percentage distribution of the decision to perform tracheostomy or not in each country (in blind). Only countries that have at least 20 patients admitted in ICU are reported alone; the remaining are grouped. Right panel (b). Percentage of early vs. late tracheostomy by centre with at least five tracheostomies. Centres within the same country have the same colour and a mass proportional to centre size. The bisector line is also reported. Results are adjusted for confounding factors**

## CONCLUSIONS

TBI patients undergo a tracheostomy, more often than ICU communities typically. In this community of people, many condition- and injury-related considerations are correlated with the choice to take a tracheostomy. An analysis that adjusts for these covariates, however, still shows substantial inter-center differences, likely reflecting inadequate evidence, lack of consensus, and lack of strong guidelines in this setting. Tracheostomy 's later success is correlated with improved Risk and poorer neurological clinical result but the causality of this association remains unproven. Randomized studies are needed to investigate the impact of tracheostomy and its pacing on the results of the patients.

## REFERENCES

Robba C, Galimberti S, Graziano F, et al. Tracheostomy practice and timing in traumatic brain-injured patients: a CENTER-TBI study. Intensive Care Med. 2020;46(5):983-994.

# A Multicenter Point Prevalence Study of Critically Ill Children's Physical Rehabilitation

## INTRODUCTION

Organ failure resuscitation and reversal are essential facets of patient care at ICU. Deep sedation and bed rest are widespread owing to modern expectations of increased medical health, physiological security and comfort for the individual. Short-term risks, including pressure ulcers, muscular fatigue, and venous thromboembolism, are correlated with deep sedation and bed rest though. Serious illness patients often usually suffer long-term physical, neurological, and psychiatric morbidities. These problems are compounded in the PICU, given that critical illness occurs in infancy and childhood during a period of intense physical and neurocognitive development. Increasing numbers of children enduring acute critical illness face heavy medical vulnerability, extended stays in PICU, and long-term morbidity. Early rehabilitation and mobility in adult ICUs, together with decreased mechanical ventilation duration, are associated with improved muscle strength and physical function. Despite this evidence, studies on point prevalence at adult ICUs have consistently shown that physical rehabilitation is rare. Early recovery and independence of chronically ill children are healthy and achievable, with both short- and long-term effects. The actual status of clinical services at PICUs, though, is unclear. It was then performed a 2-day analysis in 82 PICUs throughout the United States to assess the incidence of physical therapy and independence among patients hospitalized for at least 3 days. Additionally, perceived barriers and potential safety events for patient mobility was evaluated.

## METHODS

**Design**: National 2-day point prevalence study.

**Setting**: Eighty-two PICUs in 65 hospitals across the United States.

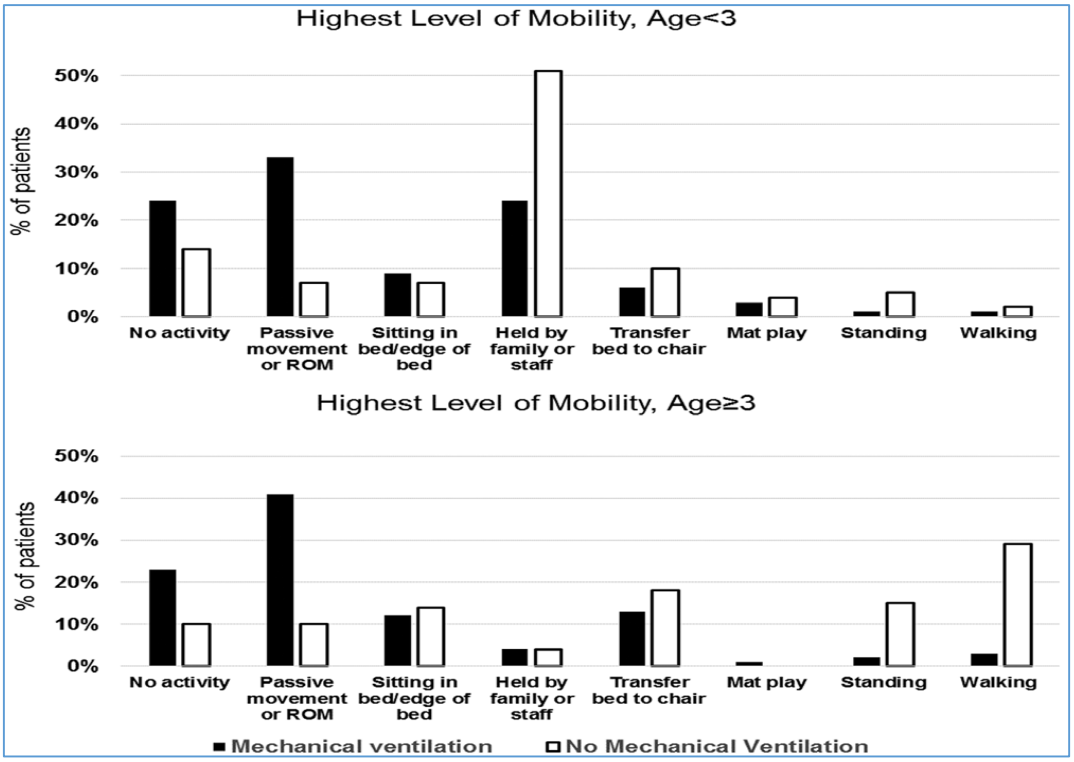
**Patients**: All patients admitted to a participating PICU for greater than or equal to 72 hours on each point prevalence day.

**Interventions**: None.

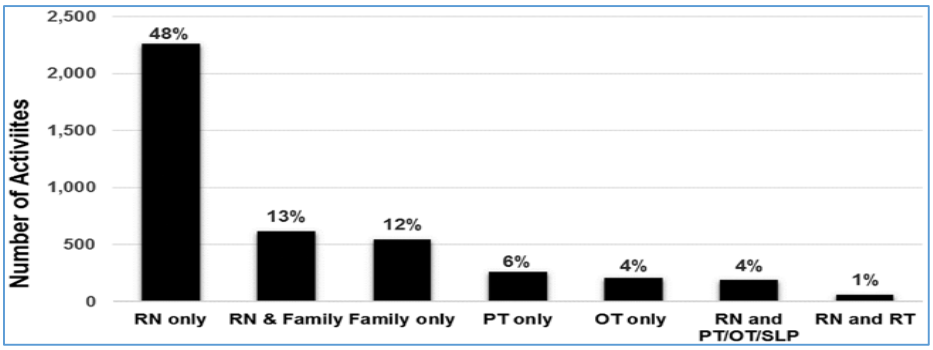
## RESULTS

The primary outcome was prevalence of physical therapy– or occupational therapy–provided mobility on the study days. PICUs also prospectively collected timing of initial rehabilitation team consultation, clinical and patient mobility data, potential mobility–associated safety events, and barriers to mobility. The point prevalence of physical therapy– or occupational therapy–provided mobility during 1,769 patient-days was 35% and associated with older age (adjusted odds ratio for 13–17 vs < 3 yr, 2.1; 95% CI, 1.5–3.1) and male gender (adjusted odds ratio for females, 0.76; 95% CI, 0.61–0.95). Patients with higher baseline function (Pediatric Cerebral Performance Category, ≤ 2 vs > 2) less often had rehabilitation consultation within the first 72 hours (27% vs 38%; $p < 0.001$). Patients were completely immobile on 19% of patient-days. A potential safety event occurred in only 4% of 4,700 mobility

sessions, most commonly a transient change in vital signs. Out-of-bed mobility was negatively associated with the presence of an endotracheal tube (adjusted odds ratio, 0.13; 95% CI, 0.1–0.2) and urinary catheter (adjusted odds ratio, 0.28; 95% CI, 0.1–0.6). Positive associations included family presence in children less than 3 years old (adjusted odds ratio, 4.55; 95% CI, 3.1–6.6).




**Highest level of mobility by mechanical ventilation status, stratified by age. ROM = range of motion.**




**Number of activities by clinician type. OT = occupational therapist; PT = physical therapist, RN = registered nurse, RT = respiratory therapist, SLP = speech-language pathology.**

## CONCLUSIONS

In US PICUs, younger infants, mothers, and patients with higher baseline function are less likely to undergo physical therapy, and the existence of intrusive tools is correlated with decreased out-of-bed mobility. Despite a low rate of potential safety events, early consultation and treatment by rehabilitation clinicians is infrequent. As an increasing number of children survive critical illness with long-lasting physical impairments, PICU rehabilitation interventions for a vulnerable population of patients need to be systematically designed and evaluated.

## REFERENCES

Kudchadkar SR, Nelliot A, Awojoodu R, et al. Physical Rehabilitation in Critically Ill Children: A Multicenter Point Prevalence Study in the United States. Crit Care Med. 2020 May;48(5):634-644.