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## Restoring physical function in post-intensive care syndrome (PICS): A review of literature

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### Abstract

**Background and Introduction:** PICS explain the series of mental, emotional & physical after effects that may persist after a patient has been discharged from the ICU.

PICS-F refers to the chronic & acute psychological consequences of acute disease & their effects on the patient's family.

**Objectives:** The aim of this study is to cognize the role physiotherapy in PICS.

### Methodology

**A. Data Source and Literature Source:** relevant articles were identified by searching from: PUBMED, cochrane literacy, Google scholar, academia.

**B. Data Selection:** Articles on the role of physiotherapy in PICS, systemic review with meta-analysis are included intensive ICU treatment lead to very severe medical conditions like respiratory failure and sepsis for days, weeks, months or even years were not able to return former level of performance.

By applying physiotherapy protocol medication is essential trying to promote reducing the occurrence of ventilator associated pneumonia, lung function, facilitating promoting safe and weaning and early release from the intensive care unit.

**Results:** More than fifteen articles are on PICS in which ten articles are matched with physiotherapy in PICS.

**Conclusion:** The study demonstrated PICS involves physical, cognitive, and mental disabilities during or after ICU stays and ICU discharge and also long-term ICU prognosis. The ABCDEFGH bundle and new therapeutic strategies, including physical therapy treatment for cures, must be developed for prevention of PICS. Physical therapy can help a lot in recovery process of PICS patients which involve (Evaluation, Assessment, Treatment, and Education).

**Discussion:** Lack of significant studies & evidence based practices needs more research on PICS.

**Keywords:** restoring physical function, PICS

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### Introduction

PICS explain the series of mental, emotional & physical effects that may persist after a patient has been discharged from the ICU.

PICS-F refers to the chronic & acute psychological consequences of acute disease & their effects on the patient's family

### Definition

Post-intensive care syndrome (PICS) describes the disability that remains in the surviving the critical illness. This comprises of impairment in cognition, psychological health, and physical function of the intensive care unit (ICU) survivor.

Emergency and intensive care medicine have evolved dramatically in the past quarter-century due to technical innovation and guidelines for improving and standardize auxiliary circulation and respiratory equipment in the intensive care unit (ICU) and standardization and improvement of educational programs. For these reasons, the short-term outcomes of ICU patients, including mortality and 28-day survival rates, have significantly improved; how-ever, the long-term prognosis and quality of life of sepsis patients have not yet improved.

Post-intensive care syndrome (PICS) refers to a patient with new or deterioration impairment in any cognitive, physical, or mental domain after intensive care. These impairments persist beyond the intensive care unit (ICU) hospitalization up to 5 to 15 years. The major risk factors for the development of PICS are acute respiratory distress syndrome (ARDS), sepsis, delirium, prolonged mechanical ventilation, and multi organ failure.

Post-ICU care for patients in rehabilitation centers, skilled nursing facilities, and enduring acute care hospitals is also subject to imposed service limitations due to exposure restrictions, limited personal shielding equipment, and risk of transmission to caregivers. Furthermore, restricted visitation policies due to the risk of transmission may increase the risk of PICS-F. Rehabilitation and revival was done at bedside with healthcare workers in

personal protective equipment. There will probably be a more important need to support mental health as many will be grieving the loss of loved ones and experience unemployment, anxiety, and social isolation. Patients with COVID-19 discharge from the hospital must be evaluating for the burden of care at home. COVID-19 has changed the healthcare landscape and could affect access to care for the elderly and minorities due to cost savings, unemployment, and lack of ability to use technology for virtual outpatient visits. At the time of hospital follow-up, primary care providers (family medicine and internal medicine physicians) should be responsive of and assess patients for signs and symptoms of PICS. Referral to an ICU recovery clinic could also help the physician administer the patient's complex and multidisciplinary physical and neuropsychiatric needs. It is vital to establish adequate screening opportunities. This may be done by a general practitioner alone or by a multiprofessional team consisting of a rehabilitation physician, a physical therapist, a psychologist, a critical care physician and others. The choice of a screening technique (including telemedicine and other e-health applications) depends on available resources, local healthcare infrastructure and availability of further rehabilitative interventions. There is strong evidence from systematic reviews that the availability and application of rehabilitation interventions are of primary importance to deal with the consequences of intensive care and mechanical ventilation. This has been supported by several randomized controlled trials as well.

### **Cognitive impairments in PICS**

Seriously ill patients experience high levels of physical and psychological stress in the ICU; these experiences consequence in cognitive impairments in patients with PICS. New or worsening impairments in cognitive function persist months to years after hospital discharge and are associated with poor daily functioning and decreased quality of life. Cognitive impairments comprise impaired memory, executive function, language, attention, and visual-spatial abilities.

Hypoglycemia, hyperglycemia, oscillations in serum glucose, delirium, and in-hospital acute stress symptoms have been recognized as possible risk factors for persistent cognitive impairment after critical illness. There is high evidence that patients with delirium in the ICU are at a greater risk of long-term results of cognitive dysfunction.

### **Dementia is a related disease of cognitive dysfunction and a number of studies have reported the association between dementia and ICU treatment.**

Mental impairment in PICS Depression, anxiety, and post-traumatic stress disorder (PTSD) are the major mental illnesses that consist of PICS. The mental status impairments that can arise among critical illness survivors include depression in approximately 30% of survivors, anxiety in 70%, and PTSD, which is characterized by intrusive memories that arise from a mixture of true events after ICU discharge, in 10–50%; therefore, every patient with supposed PICS should undergo formal mental assessment if possible. A systematic review showed that two of seven studies have shown that female sex to be a significant predictor of PTSD after ICU care. Pre-existing depression, anxiety, PTSD, subordinate education level, and alcohol abuse also increase the risk of ICU-acquired mental illness.

### **Post-intensive care syndrome- family**

Serious illness can not only have a significant physical and psychological impact on patients who live but can also have a psychological impact on their families. The factors associated with a high risk of adverse psychological conditions in the families of ICU survivors include depression, anxiety, PTSD, acute stress disorder, and complex grief. The cluster of such adverse psychological reactions is called post-intensive care syndrome- family (PICS-F).

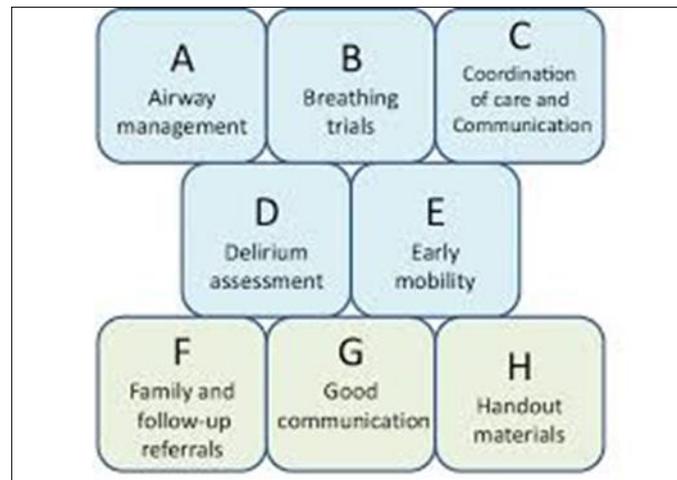
### **Prevention**

A number of prevention interventions have focused on unsympathetic psychological reactions, including improving communication, providing family support, family presence in the ICU, and using specific consultations.

### **Prevention of PICS**

#### ***ABCDEFGH bundle***

The ABCDE package is broadly known as the package that addresses the risks of sedation, delirium, and immobility. ABCDE is composed of: A, airway management, assess, pre-vent, and manage pain; B, breathing trials, including daily interruptions of mechanical ventilation, spontaneous awakening trials, and spontaneous breathing trials; C, coordination of care, choice of analgesia and sedation and communication; D, delirium assessment, management, and prevention; and E, exercise and early mobility. They are also risk factors for PICS. Furthermore, FGH can be added to the list for the prevention of PICS. FGH includes: F, family involvement, follow-up referrals, and functional reconciliation; G, good handoff communication; and H, handout materials on PICS and PICS-F. The present review focused on early mobility (physical rehabilitation), follow-up referrals (ICU follow-up clinics) with new domains, including nutrition, nursing care, diary, and environment management.



**Fig 1**

### **Physical rehabilitation**

The main reason of rehabilitation in the ICU is to improve the quality of life by maintaining, improving, and reacquiring activities of daily living. The definition of “early” in early rehabilitation practice usually refers to intensive physical rehabilitation that is implemented in addition to regular care at any time during an ICU stay. The term “early” has yet to be defined as, among various studies; the onset of interventions could vary by as much as 1 week. Many critically ill patients have PICS symptoms following ICU discharge. A previous systematic review reported no clear effect of intensive physical rehabilitation following ICU discharge on clinically related outcomes, such as quality of life. Our updated review also clarified no improvement in quality of life or mortality.

Preventing PICS symptoms from ICU admission is more important than intensive treatment of PICS following ICU discharge. Physical rehabilitation for mobility includes activities such as sitting, standing, and ambulation, as well as passive exercises including range-of-motion exercises and ergometers.

### **Post hospital discharge**

Patients with COVID-19 discharged from the hospital must be evaluated for the burden of care at home. COVID-19 has changed the healthcare landscape and may impact access to care for the elderly and minorities due to lost savings, unemployment, and inability to use technology for virtual outpatient visits. At the time of hospital follow-up, primary care providers (family medicine and internal medicine physicians) should be aware of and assess patients for signs and symptoms of PICS. Referral to an ICU recovery clinic could also help the physician manage the patient’s complex and multidisciplinary physical and neuropsychiatric needs.

Patients with COVID-19 who were critically ill and admitted to the ICU receive follow-up at the post-ICU recovery clinic 4 weeks after hospital discharge through virtual visits and in person visits. Patients often have many needs and including family members at follow-up visits allows providers to screen caregivers for distress, improve treatment adherence, and address gaps in social support.

### **Materials and Methods**

#### **Study Design**

Narrative Study/Literature Review

#### **Source of Data**

Cochrane literacy, Google scholar, SCOPUS, academia, Shodhganga, PubMed, Research Gate & Academia.

### **Results and Discussion**

Intensive care unit follow-up clinics are expected to be a place for follow-up of PICS developed during hospitalization as well as for the uncover and treatment of newly developed PICS after discharge. There is also inadequate evidence regarding the use-fulness of ICU follow-up clinics; therefore, further verification is necessary for future development.

### **Conclusion**

POST -intensive care syndrome includes cognition, physical, and mental impairments that occur during ICU stay or after ICU discharge, as well as the long-term prognosis of ICU patients. For prevention of PICS, it is important to carry out the ABCDEFGH bundle and new therapeutic strategies, including diary, nutrition, nursing care, and environmental management for healing. In addition, PICS will be a new task for intensive care medicine in the 21st century that has reached the end of mature acute care, including several problems regarding end-of-life care.

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