

Post-Intensive Care Syndrome (PICS): Physical Therapist Role in Recovery

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Abstract: *Intensive care and critical care treatments have increased positive patient outcomes considerably over the years, and healthcare has begun to consider the lingering associated aftereffects of ICU care. While many patients may successfully survive invasive ICU treatment such as mechanical ventilation, a significant portion of these patients may develop symptoms which considerably affect their quality of life. PICS, or post-intensive care syndrome, describes the cluster of patient symptoms which may develop or persist following their survival and discharge from ICU. Cognitive impairment, mental health disorders, and physical issues stemming from increased neuromuscular weakness have all been identified as symptoms which can develop following ICU discharge and have been labeled under the umbrella of PICS. PICS-family, or PICS-F, is a coordinating condition affecting the family or caregivers who provide support during ICU admission and is primarily characterized by mental health symptoms such as anxiety and depression. This paper examines the pivotal role that physical therapists may play in the treatment of PICS and alleviation of symptoms which can occur during patient's ICU treatment as well as following discharge. This paper specifically identifies physiotherapy tools for alleviation or prevention of PICS symptoms and increasing positive patient outcomes following ICU admission.*

Keywords: *post-intensive care syndrome, acute care, intensive care, physical therapy, physiotherapy, rehabilitation Post-Intensive Care Syndrome (PICS): Physical Therapist Role in Recovery*

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I. Introduction

The enhancement of critical care medicine and increased survival rates for patients experiencing severe illness has spurred doctors to explore increased options for surviving patients, post-care. This has helped lead to even more studies focusing on the improvement of results for survivors of severe disease and their improved function.

Post-intensive care syndrome describes the lingering effect which continues to persist in people who have survived any kind of critical illness in the ICU. These lingering issues may affect patient memory, psychological wellbeing, and physical function. As a result, it can also have detrimental effects on the mental health of the family members of the person suffering from PICS, which is labeled as the PICS-Family (PICS-F).

The confluence of lingering patient effects following ICU treatment is the condition PICS, or post-intensive care syndrome. Intensive ICU treatment can lead to this condition due to the very severe medical conditions (like respiratory failure and sepsis), the use of invasive protection such as endotracheal tubing and mechanical fans, and sedatives and other pain medicine which can have mind-altering effects. More people are now able to survive critical sickness due to advancements in medicine over the last few decades. Previously, clinicians have focused solely on those patients' essential consequences in the short term. More recently, health care professionals have begun to consider the long-term results of critical disease survivors and their associated treatment. Research has shown that while initial survival rates of the ICU are improved, patients for months, weeks, and even years were not able to return to former levels of performance (Pettrinec & Martin, 2018).

Definition of PICS:

Post-intensive care syndrome (PICS) describes the series of mental, emotional, and mental aftereffects that may persist after a patient has been discharged from the ICU (Harvey & Davidson, 2016).

PICS is primarily characterized by worsening physical impairment or neuromuscular weakness, mental deficiencies (judgment plus thinking), or worsening status of mental health following critical care treatment. PICS-F refers to the chronic and acute psychological consequences of acute disease and their effects on the patient's family. Symptoms include stress, depression, complicated grief, and anxiety, and have been reported in up to thirty percent of families or relatives with family members experiencing critical disease. These symptoms may arise after their family member's discharge, during their stay in the ICU, and following the death of the patient.

Risk factors related to PICS:

Owing to the related neuropsychological and physical impairment, PICS is considered now a great burden on public health, but its specific causation remains unclear.

Cognitive impairment:

According to research, PICS occurs for twenty-five percent of ICU survivors, however, other reports have stated PICS may affect as many as seventy-five percent of survivors. The main conditions which have been found to increase the patient's chance of developing PICS are delirium period in ICU, critical brain damage sustained through alcoholism or stroke, hypoxia sustained through heart attack or ARDS, and hypotension due to systemic infection or trauma.

Psychiatric diseases:

The risk of experiencing psychiatric distress through conditions such as anxiety, post-traumatic stress disorder (PTSD) and depression following release from ICU has been shown to increase to nearly sixty-two percent of patients treated. Risk factors for development of psychiatric conditions are much like cognitive impairment and include lower levels of education, female gender, presence of pre-existing disability, and ICU use of analgesia and sedation.

Physical diseases:

Neuromuscular weakness resulting from ICU confinement represent the most common type of physical disability and occurs more than twenty-five percent of people who have survived from ICU. Neuromuscular weakness may result in repeated falls, poor mobility, or even tetra or quadri paresis. Disorders which may lead to neuromuscular weakness acquired from ICU treatment include sustained mechanical ventilation (more than seven days), multisystem organ failure, sepsis, and prolonged period for treatment.

Management and prevention of PICS:

All patients who are experiencing PICS must experience a psychological assessment which includes:

- History of pre-admission,
- Capacity to adjust to stress in the past,
- History of medicines,
- Mental state and clinical status
- Family and environmental considerations.

ICU syndrome carecomprises:

- Correction or removal of causative causes,
- Effective delivery of sedatives (antipsychotic and anxiolytic agents),
- Elimination or reduction of things which cause stress (environmental)
- Regular contact with patients and families.

As often stated, "Prevention is better than cure," it assumes the same for management of PICS. The most significant anticipatory approaches proven to have a constructive effect in avoiding PICS-related long-lasting operative disabilities involve restricting the utilization of deep sedation and promoting early movement in patients with ICU, together with intensive occupational and physical therapies. This obliges a multifaceted method to get the most effective possible result and handle successfully.

The ABCDE bundle was used for PICS with good preventive rates. This includes:

- Awakening (use of sedation or light to a minimum);
- Breathing (a random check of breathing);
- Coordination of the care and communication between different disciplines;
- Monitoring, evaluating and managing deliriums;
- Early outpouring at ICU (Rawal, Yadav & Kumar, 2017).

Role of Physical Therapists in Recovery Process

Critically ill patients often suffer long-term complications of both physical and psychological nature. They are on long-term mechanical ventilation, resulting in twenty-five percent having severe muscle weakness, and about 90 percent of long-term survivors of the ICU will have continuing muscle weakness. Often connected with extended resides in the ICU are reduced quality of life, physical deterioration and increased mortality, treatment costs, morbidity, and hospital stay length. Thus, they need a multidisciplinary critical care team that is highly trained with skills and experience to assist in the diagnosis and treatment of respiratory problems, physical functional decline, and musculoskeletal and neuromuscular disorders.

As part of the multidisciplinary care approach, physiotherapy medication is essential in 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.

A physical therapist can help the PICS patient to restore the muscle, bone, tissue, and nervous system injuries and helps to get independent again. In other words, physical therapists can efficiently offer therapies to maximize the physical functioning of a patient such as the opportunity to get back to work (Bemis-Dougherty & Smith, 2013).

Physiotherapy Rehabilitation for PICS:

Physiotherapy is essential for minimizing and reducing the adverse effects during critical illness from extended bed rest and mechanical ventilation. The physiotherapist's rehabilitation is tailored to the patient's needs and relies upon the patient's knowledge of his condition, psychological status and strength. It involves both passive and active therapy that encourages and mobilizes movement. To order to reduce functional loss, early progressive physiotherapy with an emphasis on mobility and on walking when ventilated.

Short term aims:

1. Passive as well as active to maintain musculoskeletal system integrity
2. Patient positioning: To help with gravity to drain sputum from the lungs.
3. Manual techniques such as the shaking and vibration are used to loosen and clear the sputum on the ribs.
4. Address: Position a small tube in the lungs to remove excess sputum.
5. They play an important role in the removal of ventilation from a patient.

Long-term aims:

1. They aim to incorporate and reintroduce the patient into society in a comprehensive rehabilitation program.
2. Together with the medical team, they have set goals for patient rehabilitation.
3. Rehabilitation goals are defined in contact with the patient, the patient family and the medical team and are broken down into the medium, short or long term. They can be both physical and psychological, but deal with the impaired physical needs. Objectives would need to be met and a routine patient evaluation of the physical and non-physical effects during their rehabilitation and improve according to their respective objectives.

Physiotherapy Techniques beneficial for treating PICS:

➤ **Respiratory Physical therapy:**

The task of the respiratory physician is to help clear patients' airways and maintain the integrity of the respiratory system and strengthen them. Treatment procedures include:

1. Positioning,
2. Manual and ventilator hyperinflation,
3. Education,
4. Weaning from mechanical ventilation,
5. Percussion, suctioning, vibration
6. Non-invasive ventilation,
7. Respiratory muscle strengthening,
8. Breathing exercises and mobilization

➤ **Rehabilitation:**

Early mobilization with an emphasis on functioning decreases hospital stays and minimizes cognitive disability. An enquiry suggests positive results with the implementation of physiotherapy in the ICU and also examines barriers for ICU physiotherapists. A RCT pilot suggests that early in-between cycling with MV patients has positive results.

The objectives are determined by the physical, mental status of the patient. Physical therapists should make a short clinical assessment during PICS.

- Determine the likelihood of physical and non-physical morbidity for the patient.
- To recognize their current needs for rehabilitation
- Rehabilitation should begin as soon as possible for patients at risk and include:
- Measures to prevent preventable physical and non-physical diseases,
- Promoting nutrition
- A customized, structured recovery program with repeated follow-up reviews. The patient's clinical records must collect and record details of the structured rehabilitation program as well as the reviews (Denehy & Berney, 2006).

➤ **Physical rehabilitation:**

The primary function of ICU rehabilitation is to improve health through the maintenance, improvement, and recovery of everyday activities. The decline in quality of life is associated with both ICU- AW and delirium as components of PICS. The Japanese Sepsis and Septic Shock Management Practice Guidelines for 2016 (J- SSCG 2016) proposed that early stage rehabilitation should be implemented as a PICS preventive measure for sepsis or ICU patients. A recent systemic review has explained that physical rehabilitation decreases ICU-0AW, but does not improve mental health without delirium days. In order to explain the impact of physical therapy on PICS, additional, randomized controlled trials are required.

The interpretation of "early" in early rehabilitation generally implies to intensive physical rehabilitation, which is always performed during an ICU stay in addition to regular care. The term "early" must still be defined, as the start of interventions can vary by up to 1 week among different studies. After ICU discharge, many extremely ill people are experiencing symptoms of PICS. An old research showed no clear impact on clinically significant results like quality of life from intensive physical rehabilitation following ICU discharge on clinically important results, like quality of life. No change in the quality of life or mortality has also been confirmed by our updated study. Trying to prevent ICU-admission PICS symptoms is essential over intensive PICS after ICU discharge. Mobility physical rehabilitation includes sitting, stepping, and ambulatory activities, and passive workouts, including movement range exercises and ergometers. In Japan, an ICU survey found that ICUs are routinely supplied at the edge of the bed, whereas neuromuscular power stimulation and a cycle ergometer are rarely supplied. To order to avoid ICU- AW, the J- SCCG 2016 suggested neuromuscular electric stimulation. The dose response for health outcomes of physical rehabilitation is unknown. High-dose rehabilitation may contribute to a better quality of life than that for low-dose rehabilitation so further research to explain this issue is required (Inoue, Hatakeyama, Kondo, Hifumi, Sakuramoto, Kawasaki & Kenmotsu, (2019).

II. Conclusion:

Post-intensive care syndrome involves physical, cognitive, and mental disabilities during or after ICU stays and ICU discharge and also long-term ICU prognoses. 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). In addition, PICS is a latest, mature, acute treatment task for intensive care in the 21st century that has come to an end, along with a number of end-of - life care issues.

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