



# Role of Inpatient Rehabilitation in Managing Delirium: A Review



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## Abstract

Delirium is one of the commonest neuropsychiatric complication seen by a Consultation-Liaison Psychiatrist, and it is associated with significant morbidity and mortality. Increased health care costs, prolonged hospital stays, and long-term cognitive decline are other well-recognized adverse outcomes of delirium. Improved recognition of delirium and early treatment are important in diminishing such morbidity. To reduce the medication burden, non-pharmacological treatments such as early mobilization as well as involvement of Physical Therapy and Rehabilitation services are stressed upon. In this following presentation we did a systemic review of the studies which have been conducted upon the role of early mobilization to prevent/treatment for Delirium.

## Introduction

In an inpatient Hospital setting, specifically in the Intensive Care Units (ICU), Delirium is a common complication with incidences between 20 % and 89%. Delirium represents an acute encephalopathic condition, the hallmark of which is fluctuation. It is chiefly characterized by altered consciousness, impaired attention of rapid onset and fluctuation, as well as impaired cognitive function (e.g., orientation, language, perception). It is a direct result of physical conditions, procedures or medications, and a combination of predisposing and triggering factors. The consequences of delirium are increased risks of prolonged mechanical ventilation and length of stay, persistent cognitive decline, prolonged rehabilitation, and institutionalization. Early mobilization is one of the chief component of the Physical therapy principles and in that regard, the non-Pharmacological ways in which Delirium is addressed. Early mobilization is defined as an activity that consumes energy and has the goal of maintaining or supporting patient mobility through passive or active movement exercises. Hence it includes active exercises in bed as well as out-of-bed activities. Studies have been performed in ICU & Neurological settings (post-stroke) on the effectiveness of Early Mobilization for the resolution of Delirium. Some studies have found positive results in preventing and treating delirium in critically ill patients while others have shown conflicting results. Our study examined whether early mobilization either as a stand-alone intervention or as part of a physical therapy bundle, compared to usual care, prevents or shortens the duration of delirium in critically ill patients.



Delirium can be extremely distressing



Physical Therapy is one modality

## Methods and Materials

A systematic literature review was conducted. Several information sources were searched. Databases were Medline via PubMed, Cochrane, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Keywords which were used for search included "delirium, confusion, mobilization, rehabilitation, Critical Care, & Intensive Care Unit."

**Inclusion Criteria :** 1) Randomized Control Trials  
2) Objective instruments were used for Delirium assessment (CAM)  
**Exclusion Criteria :** 1) pediatric studies, or studies with majority of patients <18 years old  
2) Assessment of Delirium showed no validated instrument  
3) Study with miniscule sample size (i.e., N<10)

**Data Collection:** Data of included full texts were screened for relevant data by two researchers independently who used pre-defined Excel tables for data extraction.

**Study population:** The search yielded in 2164 sample size from database chart divided into 7 RCT studies

**Data sets:** Data sets gathered were type of intervention; with subsequent dosage of the intervention dichotomized in terms of intensity.

## Results

Odds Ratios (OR) with 95 % Confidence Intervals (CI) were calculated with studies reporting the numbers of patients with and without delirium in intervention and control groups.

For delirium prevention, 7 studies could be included. Mobilization reduced the risk for developing delirium in ICU patients by 47 % (7 studies, 2,164 patients, low to moderate risk of bias: OR 0.53 (95 %CI 0.34 to 0.83, p = 0.01), with significant heterogeneity (I<sup>2</sup> = 78 %, p < 0.001) The certainty of evidence was moderate.

Sub-Analysis

Additional sub-analyses for prevention of delirium showed significant results including none to moderate or no heterogeneity for: low-intensity interventions, studies published ≤ 2016, and for studies with moderate risk of bias. Significant risk reduction for developing delirium including significant heterogeneity was found in: studies focusing on out-of-bed mobilization. The rate of unwanted safety events was reported in five studies, and compared in three studies, with no significant differences in safety events between intervention and control group.

Author, yr, country	Interventions	Delirium Assessment	Providing team
Alvarez, Chile,2017	Prevention Bundle	CAM,DRS	Physical Therapy
Berney, Aus ,2020	Usual Rehab	CAM-ICU	Mixed Team
Karadas,Turkey,2016	Assisted Active ROM	CAM-ICU	Not reported
Moon, Korea, 2015	Part of PT Bundle	CAM-ICU	Mixed Team
Nydahl, Gemany,2020/2021	Out of Bed mobility	CAM-ICU,ICDSC	Mixed Team
Winkleman,2016	Once daily Mobilization	CAM-ICU	RN

## Discussion

This systematic literature review yielded 7 studies with low moderate risk of bias including 2,164 individuals. Analysis of the studies showed that provision of early mobilization reduced the risk of developing delirium by 47 %, albeit with meaningful heterogeneity. Additionally, mobilization reduced the duration of existing delirium by nearly-two days. Sub-Analysis showed that studies published before 2017, studies with moderate risk of bias, and low-intensity studies had significant effects and no heterogeneity.

Most studies, if not all, could achieve a preventable effect on delirium. Early mobilization is a multifaceted physical, cognitive and psychosocial activity including coordinated movements, increased proprioception, gravity effects, sympathetic activation of neurotransmitters, cognitive activation and participation, and interaction with the environment and nurses, physiotherapists and other clinicians, leading to improved orientation (and hence, represents a complex intervention.

Some studies showed better effects from usual care instead of the intervention, This raises the question: is mobilization always beneficial? In patients with severe stroke, extended early mobilization within the first 24 h after stroke onset led to a worsened outcome (AVERT Trial Collaboration group, 2015). It seems to be plausible that long durations of sitting decreases cerebral perfusion and this might be harmful in patients with neurological or cardiovascular diseases. Delirium is a syndrome with different triggers and causes, therefore the one-size-fits all "mobilization for all patients" approach might be misleading in some cases.

80 % of delirious episodes in patients in ICU can be related to shock, infection, hypoxia, or metabolic imbalances (Girard et al., 2018b). It is well known that older patients in ICU are at higher risk of delirium and that this is associated with increased morbidity. Therefore, recognition of the complexity and increased risk of elderly related adverse events should be included in prevention.

## Conclusions

Limitation of the study

- Non-English papers were not taken into consideration
- Due to the heterogeneity, it was not possible to identify the most effective mobilization for prevention and treatment of delirium.
- Use of various assessments and the diagnosis of delirium.

Due to the heterogeneity in study populations and early mobilization interventions, we are unable to draw specific conclusions regarding the appropriate method, frequency, duration or intensity of mobilization. However, the avoidance of bed rest is paramount. Early mobilization in ICU should be considered on an individual patient basis within an interprofessional approach, adapting to the patients' conditions for improving cerebral perfusion. This complex intervention, therefore, poses challenges for future research; striking a balance between rigorous trial methodology and the variability and practicalities of individualized patient care.

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