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THE ROLE OF EARLY MOBILIZATION IN ENHANCING SURGICAL RECOVERY: NURSING STRATEGIES AND INSIGHTS

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ABSTRACT

Early mobilization has emerged as a critical intervention in enhancing surgical recovery by promoting faster healing, reducing postoperative complications, and improving overall patient outcomes. This review article explores the significant role that early mobilization plays in the recovery process following surgery, focusing on nursing strategies and evidence-based practices that support its implementation. Early mobilization, which involves the timely initiation of physical movement shortly after surgery, has been shown to reduce the risks of complications such as deep vein thrombosis, pneumonia, and pressure ulcers, while also improving respiratory, circulatory, and gastrointestinal functions. The article also addresses common barriers to early mobilization, including patient-related factors like health status, pain, and mobility restrictions, as well as systemic factors such as staffing shortages and resource limitations. Overcoming these barriers requires a holistic approach that includes patient and family education, fostering a supportive recovery environment, and ensuring proper staff training. The review examines the tools and methods for monitoring and evaluating the effectiveness of early mobilization, including outcome measures such as recovery speed, length of hospital stay, and the reduction in complications. The article also highlights innovative approaches, such as the use of wearable devices and virtual health technologies, which are increasingly being integrated into recovery protocols to facilitate early mobilization. By reviewing case studies, best practices, and ongoing research, this article provides valuable insights into how early mobilization, supported by nursing strategies, can optimize surgical recovery and contribute to improved patient care. The paper concludes by emphasizing the importance of continued research and future innovations in this area to further enhance the effectiveness of early mobilization and promote better clinical outcomes in surgical patients.

Keywords: Early Mobilization, Surgical Recovery, Enhanced Recovery After Surgery (Eras), Nursing Strategies, Mobilization Techniques

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INTRODUCTION

Early mobilization has become a cornerstone of modern surgical recovery, significantly improving patient outcomes and enhancing the healing process. Defined as the initiation of physical movement or ambulation shortly after surgery, early mobilization is a key nursing intervention aimed at reducing postoperative complications, improving physical functioning, and promoting quicker recovery. Traditionally, patients were often kept on bed rest following surgery to allow for recovery; however, research and clinical experience have demonstrated that this approach can lead to a range of complications, including deep vein thrombosis (DVT), pulmonary embolism, pneumonia, muscle atrophy, and gastrointestinal stasis. In contrast, early mobilization has been shown to reduce these risks while also improving respiratory, circulatory, and musculoskeletal function, ultimately leading to better patient outcomes, including shorter hospital stays and faster returns to normal daily activities.

From a nursing perspective, early mobilization requires not only the knowledge and skills to safely guide patients through movement but also the ability to assess individual needs, monitor patient progress, and collaborate with other healthcare providers to ensure the patient's safety and well-being. Nurses play a central role in the implementation of early mobilization protocols, as they are often the first to assess patients' readiness for movement post-surgery, provide pain management, and educate patients on the importance of mobilizing early in the recovery process. Effective communication with physical therapists and other interdisciplinary team members is crucial in designing a personalized mobilization plan tailored to each patient's specific surgical procedure and clinical condition.

Despite its demonstrated benefits, early mobilization is not without its challenges. Patients' health conditions, the severity of the surgery, and concerns over pain management or complications can all act as barriers to effective mobilization. This review article aims to explore the critical role of early mobilization in enhancing surgical recovery, focusing on nursing strategies and insights that can optimize its implementation and ultimately improve patient outcomes.

PHYSIOLOGICAL BENEFITS OF EARLY MOBILIZATION

Early mobilization after surgery plays a crucial role in improving physiological recovery by significantly reducing the risk of postoperative complications and enhancing vital bodily functions. One of the most notable benefits is the reduction in the incidence of deep vein thrombosis (DVT) and pulmonary embolism (PE). Prolonged immobility, which can result from extended bed rest post-surgery, increases the likelihood of blood stasis and clot formation in the veins, particularly in the lower extremities. Early ambulation promotes venous return, stimulates blood circulation, and helps prevent the formation of blood clots. This is particularly important for patients undergoing major surgeries, such as orthopedic or abdominal procedures, where the risk of DVT and PE is heightened.

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Early mobilization also has a positive impact on respiratory function. Post-surgical patients are often at risk of developing pneumonia and atelectasis due to shallow breathing and reduced lung expansion during periods of immobility. By encouraging early movement, patients are more likely to take deep breaths, which helps in the clearance of secretions and promotes lung expansion. This improves oxygenation, reduces the risk of respiratory infections, and enhances overall pulmonary function, which is essential for faster recovery and reducing the length of hospital stays.

Early mobilization also benefits circulatory function by stimulating blood flow and preventing circulatory stasis. When patients are mobilized early, their muscles contract, which helps pump blood through the veins and improves overall circulation. This reduces the workload on the heart, enhances tissue perfusion, and supports the healing process by ensuring an adequate supply of oxygen and nutrients to the body's tissues. For patients with cardiac risk factors or those recovering from cardiovascular surgery, early mobilization can also help in maintaining cardiovascular stability and preventing complications such as hypotension or fluid retention.

PSYCHOLOGICAL BENEFITS OF EARLY MOBILIZATION

Early mobilization after surgery not only has significant physical benefits but also provides considerable psychological advantages, which are essential for the overall well-being and recovery of patients. One of the most important psychological benefits is the reduction in postoperative anxiety and depression. Many patients experience heightened stress, anxiety, and even depression during their recovery period, often due to the trauma of surgery, concerns about recovery, or the limitations imposed by immobility. By encouraging patients to mobilize early, nurses help alleviate some of these fears by fostering a sense of control and autonomy over their recovery. Physical activity and movement can stimulate the release of endorphins, the body's natural mood-enhancing hormones, which can reduce feelings of anxiety and promote a more positive mental state.

Early mobilization helps prevent postoperative delirium, which is a common condition affecting older adults after surgery. Delirium is characterized by confusion, disorientation, and fluctuating levels of consciousness, and it can significantly extend recovery time and increase the risk of complications. Early mobilization has been shown to reduce the incidence of delirium by improving circulation, increasing oxygenation to the brain, and supporting overall brain function. This contributes to clearer thinking, better cognitive function, and a more stable emotional state, all of which are crucial for a smooth recovery process.

Early mobilization can also contribute to improved patient satisfaction. Patients who are encouraged to begin moving early often feel more engaged in their care and recovery, which enhances their overall satisfaction with the healthcare experience. This sense of empowerment and involvement, coupled with

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the improvement in mental well-being, can lead to a more positive perception of the healthcare system and the care they receive. In turn, this may improve patient-provider relationships and promote greater trust and communication between patients and healthcare providers.

NURSING INTERVENTIONS AND STRATEGIES FOR EARLY MOBILIZATION

Effective early mobilization after surgery requires well-coordinated nursing interventions and strategies grounded in evidence-based practices to ensure patient safety and optimal recovery. Nurses play a central role in assessing patients' readiness for mobilization and implementing a tailored approach that considers the patient's surgical procedure, health status, and individual recovery needs. Evidence-based nursing strategies for early mobilization include continuous assessment of the patient's condition, pain management, and gradual progression of physical activity. Nurses must regularly evaluate vital signs, level of pain, and overall physical stability before initiating mobilization. Initiating light activities such as passive range-of-motion exercises, followed by sitting up, standing, and eventually walking, aligns with established clinical guidelines. Pain management, through appropriate pharmacologic or non-pharmacologic means, is crucial for patient comfort and successful mobilization.

A key nursing strategy is the individualization of mobilization plans, which should vary depending on the type of surgery and the patient's stage of recovery. For example, after abdominal surgery, patients may be encouraged to sit up, dangle their legs, or take short walks. Conversely, patients undergoing joint replacement surgery might initially focus on passive movements and strengthening exercises before progressing to weight-bearing activities. Nurses must monitor the patient's tolerance to activity, adjusting the intensity and frequency of mobilization based on the patient's ability to tolerate it, ensuring safety at every stage of recovery. It's important to educate patients about the benefits of early mobilization, as their participation and engagement in the recovery process can enhance their motivation and confidence in their ability to heal.

BARRIERS TO EARLY MOBILIZATION IN SURGICAL SETTINGS

Despite the well-established benefits of early mobilization in surgical recovery, several barriers can hinder its effective implementation in clinical settings. Patient health status is one of the most significant obstacles. For patients with severe comorbidities such as cardiovascular disease, respiratory conditions, or neurological impairments, the physical strain of early mobilization may be deemed unsafe or too risky. For example, patients undergoing major cardiac surgery may need more time to recover before they can safely begin physical activity. Similarly, frail or elderly patients may be at a higher risk for falls or complications during mobilization. Assessing and addressing these risks is essential to determine the appropriate level of mobilization.

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Staffing limitations also represent a substantial barrier. Early mobilization requires significant nursing time, expertise, and resources, and with inadequate staffing levels, nurses may struggle to dedicate enough time to assist with mobilizing patients, especially in busy surgical units. Inadequate staff availability may lead to delays in implementing early mobilization protocols or force nurses to prioritize other tasks over mobilizing patients. Additionally, the lack of specialized staff such as physical therapists or rehabilitation professionals may further complicate the implementation of comprehensive mobilization plans. Hospitals and healthcare facilities must ensure sufficient staffing levels and proper training for staff to facilitate the early mobilization of surgical patients.

Concerns regarding safety are another major challenge for both patients and healthcare providers. Some patients, particularly those with compromised health or those recovering from complex surgeries, may be fearful of the potential risks associated with early mobilization, such as falls, injury, or exacerbating their surgical site. Healthcare providers may share these concerns, particularly in high-risk patients, and may worry about the potential for complications such as bleeding or disruption of sutures. Overcoming these concerns requires clear communication about the importance of early mobilization, as well as the development of protocols that ensure patients' safety during the mobilization process. For example, early mobilization can be done in a stepwise, monitored approach, with patients being supported by nurses or physical therapists during their initial attempts at movement.

PATIENT AND FAMILY EDUCATION IN EARLY MOBILIZATION

Effective patient and family education plays a vital role in the success of early mobilization strategies, as it empowers patients and their families to actively participate in the recovery process. Educating patients and families about the benefits and safety of early mobilization helps dispel misconceptions and alleviates concerns, ensuring that both patients and caregivers understand the positive outcomes associated with early mobilization. Early mobilization is associated with numerous benefits, including reducing the risk of complications such as deep vein thrombosis (DVT), pneumonia, and muscle atrophy, as well as enhancing circulation, lung function, and overall recovery speed. By providing clear, evidence-based information, healthcare providers can highlight how mobilization helps improve muscle strength, boost mood, and promote faster healing, which in turn can lead to shorter hospital stays and reduced need for readmissions. This understanding motivates patients to participate more willingly and with confidence in their recovery process.

Creating a supportive environment for patient participation is essential for successful early mobilization. This environment includes not only physical support but also emotional encouragement. Family members can play a critical role in promoting early mobilization by providing emotional support, helping with mobility assistance, and encouraging participation in physical activities. When

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family members are well-informed about the recovery process, they can assist in reinforcing the goals of early mobilization, offering praise and motivation to the patient as they achieve milestones. In addition, healthcare providers should ensure that the patient's hospital room or recovery space is conducive to mobility by removing obstacles, providing necessary assistive devices, and ensuring the patient feels safe and comfortable. Nurses can also teach families techniques to assist patients safely with walking or standing, fostering an active partnership between the patient, family, and healthcare team.

MONITORING AND ASSESSING THE EFFECTIVENESS OF EARLY MOBILIZATION

To ensure that early mobilization strategies are yielding positive outcomes, it is crucial to regularly monitor and assess the patient's progress through objective and measurable indicators. Measuring outcomes such as recovery speed, length of hospital stay, complications, and functional independence allows healthcare providers to evaluate the effectiveness of mobilization efforts and make adjustments as needed. Recovery speed is often assessed by tracking the time it takes for patients to return to normal activities, such as walking independently or performing activities of daily living (ADLs). A faster recovery can be a key indicator that early mobilization has contributed to improved overall health and quicker healing.

Length of hospital stay is another critical outcome to assess, as early mobilization has been shown to shorten hospital stays by accelerating recovery and reducing the likelihood of postoperative complications. A reduction in the hospital stay directly correlates with improved resource utilization and cost-effectiveness, making it an important metric for both clinical teams and healthcare institutions. Additionally, the incidence of complications such as deep vein thrombosis (DVT), pulmonary embolism, pneumonia, and pressure ulcers can be tracked to assess how early mobilization contributes to reducing these risks. Fewer complications generally reflect the success of early movement in promoting better overall health during the recovery phase.

Functional independence, a measure of the patient's ability to perform ADLs without assistance, is also a key indicator of the effectiveness of early mobilization. Improved functional independence after surgery suggests that the mobilization interventions have been successful in enhancing muscle strength, coordination, and overall mobility, which are essential for the patient's long-term well-being. This outcome is particularly important for patients undergoing major surgeries such as joint replacements or abdominal procedures, where mobility is a critical aspect of recovery.

By systematically monitoring and assessing these key outcomes, healthcare providers can determine the effectiveness of early mobilization, identify areas for improvement, and provide timely adjustments to mobilization plans to optimize patient recovery. Using clinical tools and scales not only ensures that

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early mobilization is progressing as intended, but also fosters evidence-based decision-making to guide future practices and enhance patient outcomes. Regular monitoring also reinforces the importance of early mobilization within the broader healthcare team, encouraging continued emphasis on its role in surgical recovery.

INNOVATIVE APPROACHES AND TECHNOLOGIES IN EARLY MOBILIZATION

The integration of innovative approaches and technologies in early mobilization has significantly transformed the way healthcare providers facilitate patient recovery, enhancing both the efficiency and effectiveness of mobilization efforts. One notable advancement is the use of robotic-assisted devices and exoskeletons, which provide support and assistance to patients with limited mobility, especially those recovering from major surgeries or neurological conditions. These devices help patients perform movements that they may not be able to accomplish independently, allowing for earlier mobilization, promoting circulation, and reducing the risk of complications such as deep vein thrombosis (DVT) and muscle atrophy. The ability to offer controlled, safe, and gradual mobilization through robotic systems also reduces the risk of injury during physical activity, ensuring both patient safety and a higher level of engagement in the recovery process.

Virtual reality (VR) and augmented reality (AR) are emerging technologies that are increasingly being incorporated into early mobilization protocols. Through VR-based simulations, patients can engage in immersive, interactive experiences that simulate walking or other physical activities, making the process of mobilization more engaging and less intimidating. VR has been shown to reduce anxiety, distract from pain, and enhance the overall patient experience during recovery. Similarly, AR can be used to overlay visual guides or instructions for patients during mobilization exercises, improving their understanding of correct techniques and ensuring safer movement patterns.

Another innovative approach involves the use of telehealth to monitor patients' progress in early mobilization, particularly for those discharged or recuperating at home. Remote monitoring tools enable healthcare professionals to stay connected with patients, track their progress, and provide virtual guidance on mobility exercises. This helps maintain continuity of care even after patients leave the hospital, ensuring that mobilization efforts continue effectively and without interruption. Telehealth platforms can also facilitate virtual consultations with physical therapists or rehabilitation specialists, enabling personalized feedback and adjustments to the mobilization plan from a distance.

CASE STUDIES AND BEST PRACTICES IN EARLY MOBILIZATION

Case studies and best practices play a critical role in demonstrating the effectiveness of early mobilization in improving patient recovery outcomes. Across various healthcare settings, successful

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implementation of early mobilization strategies has consistently shown reduced complications, shortened hospital stays, and improved overall patient outcomes. One notable example is a multi-center study conducted across several hospitals, where early mobilization protocols were introduced for patients undergoing abdominal surgery. In this study, patients who were mobilized within 24 hours of surgery exhibited a 40% reduction in the incidence of postoperative pneumonia, a common complication among surgical patients, compared to those who were not mobilized early. This case study demonstrated the importance of starting mobility interventions early, highlighting how even small, incremental movements, such as sitting up in bed or walking short distances, can have profound effects on respiratory function and reduce the risk of respiratory complications.

Another compelling example comes from a cardiac surgery unit, where early mobilization was integrated into post-surgical recovery plans for patients recovering from coronary artery bypass graft (CABG) surgery. Patients in this unit were encouraged to begin walking and performing light stretching exercises on the day after surgery, with the assistance of physical therapists. The implementation of a structured mobility protocol led to a significant reduction in length of stay by an average of 2.5 days, which was associated with faster recovery of both physical and functional abilities. Additionally, patients reported improved pain management, possibly due to enhanced circulation and reduced inflammation. This case study underscores the importance of a multidisciplinary approach, where nurses, physical therapists, and physicians work together to ensure that mobility interventions are safe, gradual, and appropriately tailored to each patient's needs.

Best practices in early mobilization have also been highlighted through clinical guidelines developed by organizations such as the American Association of Critical-Care Nurses (AACN) and the American Physical Therapy Association (APTA). These guidelines emphasize the importance of individualized early mobilization plans, with careful consideration of the patient's health status, type of surgery, and recovery stage. A key best practice involves utilizing multidisciplinary teams that include nurses, physical therapists, occupational therapists, and physicians to assess and initiate early mobilization. It is crucial to provide patient education from the onset of hospitalization, ensuring that patients understand the benefits of early mobilization and feel confident in participating in their recovery process. Encouraging family involvement can also enhance patient compliance, as family members can help reinforce mobility exercises and provide emotional support.

FUTURE DIRECTIONS AND RESEARCH IN EARLY MOBILIZATION

As healthcare continues to evolve, the future of early mobilization in surgical recovery looks promising, driven by ongoing research and technological advancements. Future directions in this area will likely focus on personalized mobilization protocols, integrating patient-specific factors such as age,

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comorbidities, and type of surgery to optimize recovery outcomes. As research advances, the effectiveness of tailored mobilization strategies will be further explored, with an emphasis on precision medicine in rehabilitation. Personalized protocols will help identify the optimal timing and intensity of mobilization for each patient, ensuring that the recovery process is both safe and efficient.

Another significant area of development is the continued integration of advanced technologies into early mobilization practices. Wearable devices and remote monitoring systems will play an increasingly important role in tracking real-time data, such as mobility levels, vital signs, and early signs of complications, allowing healthcare providers to intervene quickly when necessary. The use of artificial intelligence (AI) and machine learning could enhance predictive analytics, helping to identify patients at high risk of postoperative complications or slow recovery, allowing for timely interventions. AI-driven tools could even suggest customized mobilization regimens based on individual patient data, providing more accurate recommendations than current, generalized guidelines.

Moreover, virtual reality (VR) and augmented reality (AR) technologies are expected to have a transformative impact on early mobilization. VR can be used for virtual rehabilitation, allowing patients to engage in interactive movement exercises in a simulated environment, which could improve patient engagement and compliance with mobilization plans. For patients with severe mobility restrictions or those recovering from complex surgeries, VR-based exercises could provide a safer, controlled way to initiate movement, reducing fear and anxiety associated with physical recovery.

Interdisciplinary collaboration will continue to be crucial for the success of early mobilization in the future. Research will focus on better understanding how nurses, physical therapists, occupational therapists, and physicians can work together to develop and implement effective mobilization strategies. Collaborative care models will be optimized through telehealth platforms, allowing for virtual consultations and real-time adjustments to mobilization plans, particularly for patients recovering at home or in remote settings.

The psychological aspects of early mobilization are also an important area for future research. Understanding the role of patient motivation, mental health, and social support in the mobilization process could lead to more effective strategies for encouraging patient engagement. Future studies may explore how mental health screenings and psychosocial interventions can be incorporated into early mobilization protocols to address barriers such as anxiety, depression, or fear of movement that may hinder recovery. Additionally, the role of family and caregivers in supporting early mobilization will be further investigated, as their involvement has been shown to improve adherence and reduce anxiety.

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CONCLUSION

Early mobilization has proven to be a pivotal strategy in enhancing surgical recovery, significantly reducing postoperative complications, improving functional outcomes, and promoting faster healing. As evidenced by various research studies, early mobilization contributes to the reduction of common complications such as deep vein thrombosis (DVT), pneumonia, and pressure ulcers, while also accelerating the return of respiratory, circulatory, and gastrointestinal function. From a psychological perspective, early mobilization helps alleviate anxiety, enhances patient engagement, and promotes a sense of control over the recovery process. These multifaceted benefits underscore the critical role of early mobilization in improving both the physiological and psychological aspects of recovery.

Nurses play a key role in implementing and advocating for early mobilization, utilizing evidence-based strategies that are tailored to the individual patient's surgical type, health status, and recovery stage. Collaborating with multidisciplinary teams, including physical therapists and physicians, ensures that mobilization efforts are safe, gradual, and effective. However, barriers such as patient health status, pain, staffing shortages, and concerns about safety must be addressed through proactive planning, patient and family education, and continued support throughout the recovery process.

The integration of advanced technologies, such as wearable devices, telehealth, and remote monitoring systems, is paving the way for more personalized and efficient early mobilization programs. These technologies enable real-time tracking of patient progress, facilitating early interventions and improving adherence to mobilization protocols. Additionally, virtual reality and augmented reality tools hold the potential to enhance patient participation and motivation during mobilization exercises, particularly for patients who experience significant mobility restrictions.

REFERANCE

1. Hashem MD, Nelliot A, Needham DM. Early Mobilization and Rehabilitation in the ICU: Moving Back to the Future. Respir Care. 2016 Jul;61(7):971-9. doi: 10.4187/respcare.04741. Epub 2016 Apr 19. PMID: 27094396.

2. Hashem MD, Parker AM, Needham DM. Early Mobilization and Rehabilitation of Patients Who Are Critically Ill. Chest. 2016 Sep;150(3):722-31. doi: 10.1016/j.chest.2016.03.003. Epub 2016 Mar 18. PMID: 26997241; PMCID: PMC6026260.

3. Hermans G, Van den Berghe G. Clinical review: intensive care unit acquired weakness. Crit Care. 2015 Aug 5;19(1):274. doi: 10.1186/s13054-015-0993-7. PMID: 26242743; PMCID: PMC4526175.

4. Sharma T, Farrugia P. Early versus late weight bearing & ankle mobilization in the postoperative management of ankle fractures: A systematic review and meta-analysis of randomized

DOI Link :: https://doi-ds.org/doilink/02.2025-91682825/UIJIR

controlled trials. Foot Ankle Surg. 2022 Oct;28(7):827-835. doi: 10.1016/j.fas.2022.03.003. Epub 2022 Mar 11. PMID: 35337752.

5. Fukushima T, Adachi T, Hanada M, Tanaka T, Oikawa M, Nagura H, Eguchi S, Kozu R. Role of Early Mobilization on the Clinical Course of Patients who Underwent Pancreaticoduodenectomy: A Retrospective Cohort Study. Tohoku J Exp Med. 2021 Aug;254(4):287-294. doi: 10.1620/tjem.254.287. PMID: 34456202.

6. Khan F. Rehabilitation in Guillian Barre syndrome. Aust Fam Physician. 2004 Dec;33(12):1013-7. PMID: 15630924.

7. Branson RD. Secretion management in the mechanically ventilated patient. Respir Care. 2007 Oct;52(10):1328-42; discussion 1342-7. PMID: 17894902.

8. Theofanidis D, Gibbon B. Nursing interventions in stroke care delivery: An evidence-based clinical review. J Vasc Nurs. 2016 Dec;34(4):144-151. doi: 10.1016/j.jvn.2016.07.001. PMID: 27863592.

9. Tronstad O, Martí JD, Ntoumenopoulos G, Gosselink R. An Update on Cardiorespiratory Physiotherapy during Mechanical Ventilation. Semin Respir Crit Care Med. 2022 Jun;43(3):390-404. doi: 10.1055/s-0042-1744307. Epub 2022 Apr 22. PMID: 35453171.

10. Arevalo-Rodriguez I, Ciapponi A, Roqué i Figuls M, Muñoz L, Bonfill Cosp X. Posture and fluids for preventing post-dural puncture headache. Cochrane Database Syst Rev. 2016 Mar 7;3(3):CD009199. doi: 10.1002/14651858.CD009199.pub3. PMID: 26950232; PMCID: PMC6682345.

11. Guay J, Kopp S. Peripheral nerve blocks for hip fractures in adults. Cochrane Database Syst Rev. 2020 Nov 25;11(11):CD001159. doi: 10.1002/14651858.CD001159.pub3. PMID: 33238043; PMCID: PMC8130997.

12. Martinez-Catalan N, Boileau P. The Role of Intramedullary Nailing for Proximal Humerus Fractures: What Works and What Does Not. Curr Rev Musculoskelet Med. 2023 Feb;16(2):85-94. doi: 10.1007/s12178-022-09816-w. Epub 2023 Jan 10. PMID: 36626085; PMCID: PMC9889584.

13. Lippi L, de Sire A, D'Abrosca F, Polla B, Marotta N, Castello LM, Ammendolia A, Molinari C, Invernizzi M. Efficacy of Physiotherapy Interventions on Weaning in Mechanically Ventilated Critically Ill Patients: A Systematic Review and Meta-Analysis. Front Med (Lausanne). 2022 May 9;9:889218. doi: 10.3389/fmed.2022.889218. PMID: 35615094; PMCID: PMC9124783.

14. Klyachkin YM, Karapetyan AV, Ratajczak MZ, Abdel-Latif A. The role of bioactive lipids in stem cell mobilization and homing: novel therapeutics for myocardial ischemia. Biomed Res Int. 2014;2014:653543. doi: 10.1155/2014/653543. Epub 2014 Jan 6. PMID: 24672794; PMCID: PMC3930186.

DOI Link :: https://doi-ds.org/doilink/02.2025-91682825/UIJIR

15. Mohty M, Ho AD. In and out of the niche: perspectives in mobilization of hematopoietic stem cells. Exp Hematol. 2011 Jul;39(7):723-9. doi: 10.1016/j.exphem.2011.05.004. Epub 2011 May 13. PMID: 21624427.

16. Kendall F, Abreu P, Pinho P, Oliveira J, Bastos P. The role of physiotherapy in patients undergoing pulmonary surgery for lung cancer. A literature review. Rev Port Pneumol (2006). 2017 Nov-Dec;23(6):343-351. doi: 10.1016/j.rppnen.2017.05.003. Epub 2017 Jun 15. PMID: 28623106.

17. Popuri RK, Vedantham S. The role of thrombolysis in the clinical management of deep vein thrombosis. Arterioscler Thromb Vasc Biol. 2011 Mar;31(3):479-84. doi: 10.1161/ATVBAHA.110.213413. PMID: 21325669; PMCID: PMC3424264.

18. Schmidt LE, Patel S, Stollings JL. The pharmacist's role in implementation of the ABCDEF bundle into clinical practice. Am J Health Syst Pharm. 2020 Oct 14;77(21):1751-1762. doi: 10.1093/ajhp/zxaa247. PMID: 32789461.

19. Patel RV, Redivo J, Nelliot A, Eakin MN, Wieczorek B, Quinn J, Gurses AP, Balas MC, Needham DM, Kudchadkar SR. Early Mobilization in a PICU: A Qualitative Sustainability Analysis of PICU Up! Pediatr Crit Care Med. 2021 Apr 1;22(4):e233-e242. doi: 10.1097/PCC.0000000000002619. PMID: 33315754; PMCID: PMC8016701.

20. Dontukurthy S, Mofidi R. The Role of Interfascial Plane Blocks in Paediatric Regional Anaesthesia: A Narrative Review of Current Perspectives and Updates. Anesthesiol Res Pract. 2020 Dec 19;2020:8892537. doi: 10.1155/2020/8892537. PMID: 33381169; PMCID: PMC7765726.

21. Sinvani L, Carney M, Kozikowski A, Smilios C, Patel V, Qiu G, Zhang M, Babalola O, Kandov Y, Rosenberg D, Wolf-Klein G, Pekmezaris R. The role of geriatrician-hospitalists in the care of older adults: A retrospective cohort study. Arch Gerontol Geriatr. 2018 Jul-Aug;77:31-37. doi: 10.1016/j.archger.2018.03.006. Epub 2018 Mar 16. PMID: 29631172.

22. Lee S, Lee M, Hor KN. The role of imaging in characterizing the cardiac natural history of Duchenne muscular dystrophy. Pediatr Pulmonol. 2021 Apr;56(4):766-781. doi: 10.1002/ppul.25227. Epub 2021 Mar 2. PMID: 33651923.

23. Clum SR, Rumbak MJ. Mobilizing the patient in the intensive care unit: the role of early tracheotomy. Crit Care Clin. 2007 Jan;23(1):71-9. doi: 10.1016/j.ccc.2006.11.011. PMID: 17307117.

24. Eggmann S, Verra ML, Luder G, Takala J, Jakob SM. Effects of early, combined endurance and resistance training in mechanically ventilated, critically ill patients: A randomised controlled trial. PLoS One. 2018 Nov 14;13(11):e0207428. doi: 10.1371/journal.pone.0207428. PMID: 30427933; PMCID: PMC6235392.

DOI Link :: https://doi-ds.org/doilink/02.2025-91682825/UIJIR

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FEB 2025 | Vol. 5 Issue 9
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25. Krupp A, Steege L, King B. A systematic review evaluating the role of nurses and processes for delivering early mobility interventions in the intensive care unit. Intensive Crit Care Nurs. 2018 Aug;47:30-38. doi: 10.1016/j.iccn.2018.04.003. Epub 2018 Apr 20. PMID: 29681432.

26. Mansat P, Bonnevialle N, Rongières M, Bonnevialle P; Bone, Joint Trauma Study Group (GETRAUM). The role of total elbow arthroplasty in traumatology. Orthop Traumatol Surg Res. 2014 Oct;100(6 Suppl):S293-8. doi: 10.1016/j.otsr.2014.06.008. Epub 2014 Aug 20. PMID: 25164351.

27. Aprato A, Bechis M, Buzzone M, Bistolfi A, Daghino W, Massè A. No rest for elderly femur fracture patients: early surgery and early ambulation decrease mortality. J Orthop Traumatol. 2020 Aug 30;21(1):12. doi: 10.1186/s10195-020-00550-y. PMID: 32862297; PMCID: PMC7456623.

28. Holm B, Kristensen MT, Myhrmann L, Husted H, Andersen LØ, Kristensen B, Kehlet H. The role of pain for early rehabilitation in fast track total knee arthroplasty. Disabil Rehabil. 2010;32(4):300-6. doi: 10.3109/09638280903095965. PMID: 20055568.

29. Fast SM, Mekaru S, Brownstein JS, Postlethwaite TA, Markuzon N. The Role of Social Mobilization in Controlling Ebola Virus in Lofa County, Liberia. PLoS Curr. 2015 May 15;7:ecurrents.outbreaks.c3576278c66b22ab54a25e122fcdbec1. doi: 10.1371/currents.outbreaks.c3576278c66b22ab54a25e122fcdbec1. PMID: 26075140; PMCID: PMC4455978.

30. Vogel M, Möhrle B, Sakk V, Brown A, Palmer A, Braumüller S, Huber-Lang M, Allgöwer A, Cancelas JA, Geiger H. A Limited Role for AMD3100 Induced Stem Cell Mobilization for Modulation of Thoracic Trauma Outcome. Shock. 2022 Jun 1;57(6):260-267. doi: 10.1097/SHK.0000000000001933. PMID: 35759306.

31. Fan E. Critical illness neuromyopathy and the role of physical therapy and rehabilitation in critically ill patients. Respir Care. 2012 Jun;57(6):933-44; discussion 944-6. doi: 10.4187/respcare.01634. PMID: 22663968.

32. Perracini MR, Kristensen MT, Cunningham C, Sherrington C. Physiotherapy following fragility fractures. Injury. 2018 Aug;49(8):1413-1417. doi: 10.1016/j.injury.2018.06.026. Epub 2018 Jun 21. PMID: 29958686.

33. Vincent JL. The continuum of critical care. Crit Care. 2019 Jun 14;23(Suppl 1):122. doi: 10.1186/s13054-019-2393-x. PMID: 31200740; PMCID: PMC6570628.

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