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Postoperative Delirium and Evidence-Based Nursing Management in Geriatric Patients

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Abstract

Delirium is an important complication that is frequently encountered in geriatric patients in the postoperative period and is characterized by increased unfavorable patient outcomes, causing repeated hospital admissions, increased costs of surgery and care, and decreased quality of life. Nurses play a key role in the provision of care for this complication, which affects patients and their families unfavorably in every aspect from the diagnosis to the management of postoperative delirium. In this review, it is aimed to discuss postoperative delirium and nursing interventions in geriatric patients in line with current and evidence-based information.

Keywords: Geriatric patient, nursing interventions, postoperative delirium

Introduction

Delirium is a neurobehavioral syndrome, which develops quickly with fluctuations during the day and is characterized by acute cognitive dysfunction affecting attention, memory, orientation, thinking, language, and perception resulting from disordered neuronal activity and accompanying systemic disorders.[1,2] In the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders, delirium is defined as "reduced ability to direct, focus, sustain, and shift attention".[3] This syndrome is categorized under three clinical subheadings based on motor activity as follows: hypoactive delirium, hyperactive delirium, and mixed delirium. Hypoactive delirium is characterized by decreases in psychomotor activity, alertness, speech, and awareness. Hyperactive delirium is characterized by agitation, constant wandering, irritability, hallucinations, fast speech, speaking loudly, and problem behaviors including singing, swearing, and laughing. Mixed delirium is characterized by features of both hyperactive and hypoactive delirium, alternating in short periods.[2,4]

Delirium occurs in 30% of inpatient adults.[5] Gottlieb et al[6] compared two groups of hospitalized older adults with and without a diagnosis of delirium based on DSM-III criteria. While impairment and fluctuation of memory, confusion, disorientation, and an acute onset were present in 100% of patients with delirium, the same symptoms were present at the following rates of 64%, 9%, 5%, 34%, and 12%, respectively, in patients without a diagnosis of delirium. Perceptual disorders, incoherent speech, sleep disturbance, and psychomotor changes were observed in patients in similar studies.[6,7]

Major risk factors for the development of delirium include aging and surgical processes. Delirium after surgery (postoperative delirium) occurs in patients undergoing surgical procedures and anesthesia, with clinical manifestations peaking 1–3 days after the operation.[8] Postoperative delirium rates vary between 10% and 87%, depending on the age of the patients and the type of surgery.[9] In the literature, it is reported that 50% of oncology patients,[10] 45% of orthopedic surgery patients,[11,12] 43% of general surgery patients,[13] and 19% of elective surgery patients[14] develop postoperative delirium. In studies conducted in Türkiye, it was determined that 45% of the patients in the anesthesiology and reanimation unit[15] and 29.5% of the cardiac surgery patients in the intensive care unit[16] developed postoperative delirium.

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Many risk factors play a role in the development of postoperative delirium. Risk factors in the preoperative period include advanced age, comorbidity, anticholinergic drug effects, inadequate fluid intake during the preoperative period and dehydration, and hyponatremia or hypernatremia. The site of surgery (abdominal or cardiothoracic region), intraoperative bleeding, pain, intensive care unit admission, long-term intubation/mechanical ventilation, inadequate pain management, and disruption of circadian rhythm are listed among the postoperative risk factors.[17,18] Aldecoa et al suggested the acrostic, reading "I WATCH DEATH," to list the factors involved in the etiology of delirium as follows: I: postoperative infections, W: Withdrawal, A: Acute metabolic conditions, T: Trauma, C: Central nervous system's pathologies, H: hypoxia, D: deficiencies, E: endocrinopathies, T: toxins, and H: heavy metals.[19] The pathophysiology of postoperative delirium is shown in Figure 1.[4]

In cases of failures in making a prompt diagnosis and starting timely management, postoperative delirium can lead to long-term health problems, including cognitive and functional decline. Furthermore, the risk of physical injury and hospital admissions and the need for long-term care increase in these patients.[20]

Post-operative Delirium in Geriatric Patients

It can be difficult to diagnose delirium in a geriatric patient because the clinical table can be misinterpreted as dementia, depression, or the manifestation of the natural aging process.[14,17] Studies have investigated delirium in the hospital setting and in geriatric individuals rather than the general population.[21] This syndrome develops rarely in outpatient settings,[22] affecting approximately 20% of inpatients over 75 years of age.[23]

Being prone to develop delirium because of the advanced age and relevant susceptibilities, surgical patients over the age of 65[24] are admitted to the hospital for surgical and non-surgical procedures more commonly compared to other age groups. For that reason, the rate of geriatric patients hospitalized in postoperative delirium units and intensive care is increasing.[25] According to the American Geriatrics Society, postoperative delirium, affecting 50% of geriatric patients, is the most common complication of surgery for the geriatric population. Studies report increased rates of postoperative delirium in geriatric patients undergoing cancer surgery (4–50%), general surgery (3–50%), and orthopedic surgery (3–45%).[12,26] Postoperative delirium may cause agitation (with falls, displacement of nasogastric tubes and intravenous catheters, aspiration, and increased urinary catheterization) and an increased need for sedation in older adults,[27] leading to an increased need for intensive care admissions in this population. Geriatric patients in the intensive care unit are at very high risk for the development of delirium due to several factors such as multiple system diseases and the use of psychoactive drugs.[28]

Studies show that postoperative delirium in geriatric patients causes increases in postoperative mortality, rates of readmission, the length of hospital stay, and costs of health-care delivery, resulting in several untoward situations.[11,29] A meta-analysis study reported that postoperative mortality in geriatric patients with postoperative delirium varied in a range from 3% to 84%.[12] Recognition of risk factors and making a timely diagnosis have become vital factors for the prevention and reduced rates of postoperative delirium, which would otherwise be increasingly associated with adverse patient outcomes and increased health-care costs.[9]

Successful management of postoperative delirium in geriatric patients includes pharmacological and non-pharmacological interventions for the prevention and treatment of delirium.[20] In the national institute for health and care excellence updated guideline 2019, it is recommended that patients with risk factors for the development of delirium should be evaluated and monitored for delirium in the first 24 h of hospital admission.[28] In a study, where a care protocol for delirium prevention was followed in the management of hip fracture patients in Turkey, delirium did not develop, and sleep quality was improved in the patient group receiving care according to the protocol. The study reported that 15% of the patients developed delirium in the group, where the protocol was not administered.[30] Early diagnosis and treatment are very important for the prevention and treatment of delirium.[28,30,31]

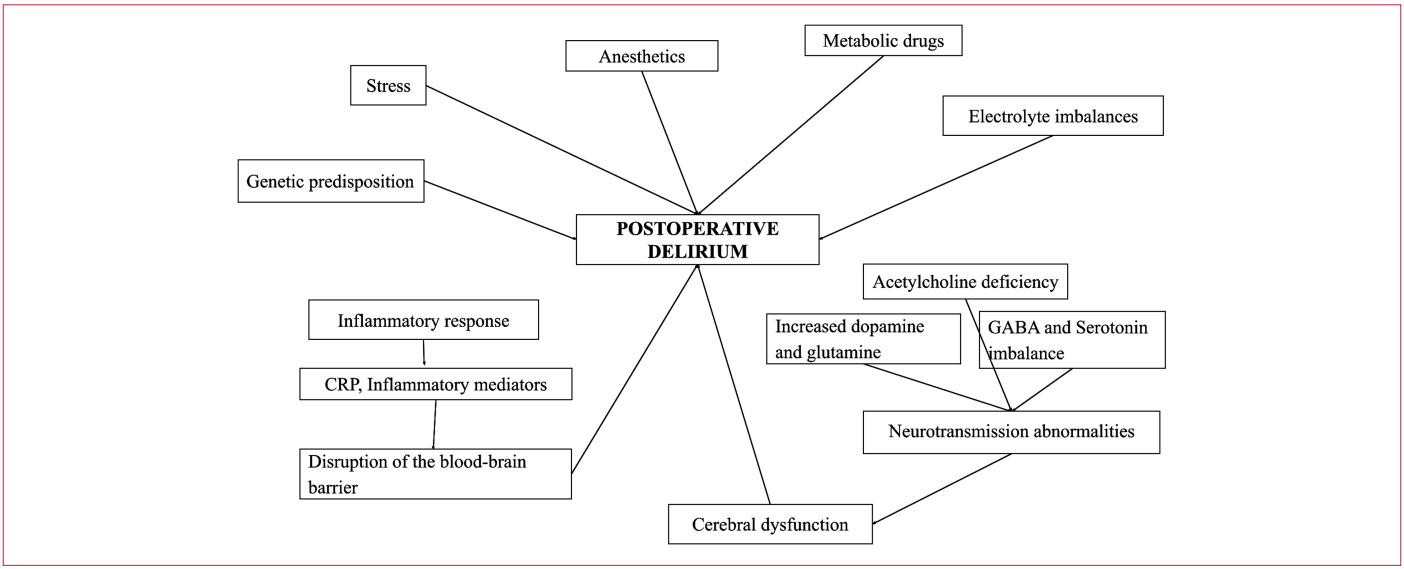

Figure 1. Pathophysiology of postoperative delirium.

Nursing Interventions for Delirium in Geriatric Surgery Patients

Prevention of Delirium

Although the factors leading to the development of delirium are numerous, its incidence and untoward consequences can be reduced if well managed. It has been reported that well-planned interventions with predetermined risks may help reduce the incidence of delirium by almost 30–40%.[32] Due to the multifactorial nature of delirium, the necessity and benefits of interdisciplinary multifactorial approaches are discussed in many studies.[33,34] In this context, interventions to prevent postoperative delirium include limiting the depth of intraoperative sedation, giving adequate analgesia before and after surgery, and administering deep anesthesia when regional anesthesia is not sufficient.[25] Furthermore, the health-care team responsible for the perioperative care of the geriatric patient should have the necessary knowledge and skills to identify high-risk patients and postoperative delirium and provide effective care to delirium patients.[20] Delirium management is a subject matter that is highly relevant to nursing care.[17] However, studies have shown that nurses are not adequately knowledgeable about delirium.[35,36] Because nurses are the health-care professionals, who provide the longest duration of care and interact with patients the most, they occupy a very important position to observe changes in the cognitive functions of patients and make a timely diagnosis.[37] Multicomponent interventions are the most effective methods to prevent delirium, and the process is effectively managed through cooperation between health disciplines.[17] According to the American nurses association, major roles, and responsibilities of nurses in the management of delirium include patient screening for risk factors, the development of strategies for delirium prevention, the assessment and diagnosis of delirium, and the appropriate and timely administration of pharmacological and non-pharmacological interventions.[38]

In a study on geriatric patients to evaluate the effectiveness of a versatile training program for improving the practical skills, knowledge ability, and self-confidence of health-care professionals, it was observed that the risk of delirium decreased from 19% to 10.1% and the discharge function score improved from 2.97 to 7.61.[39] In a quasi-experimental study conducted to determine the effectiveness of the nursing interventions for delirium prevention in critically ill patients in the intensive care unit, the incidences of delirium in the control and intervention groups were 20.1% and 0.6%, respectively.[40] In a study, it was found that nurse-led interdisciplinary delirium intervention programs had favorable effects on delirium incidence, prognosis, cognitive functioning, functional rehabilitation, mortality, and the length of hospital stay in geriatric and orthopedic patients.[17] In another study conducted to evaluate the effectiveness of a multicomponent intervention in delirium prevention in the intensive care unit and to determine a relevant implementation strategy, it was observed that the risk of delirium decreased significantly from 38% to 24% as a result of the interventions.[41] In a study evaluating the effect of music on delirium prevention, it was observed that none of the patients, who listened to music in the trauma intensive care and the orthopedic trauma service, developed delirium.[42] These results show that nursing interventions play a key role in preventing postoperative delirium in geriatric patients.

Care and Treatment in Delirium

In addition to general perioperative care, it is recommended to use delirium-specific care packages for the prevention of postoperative delirium in older patients.[14,31] The ABCDE bundle program is a care package developed by the American Association of Critical Care Nurses to be administered to patients at the bedside. The updated "ABCDEF" package consists of the following topics including the assessment and management of pain, both spontaneous-awakening trials and spontaneous breathing trials, choice of sedation if needed, assessment and management of delirium, early mobility, family engagement, and empowerment (Figure 2).[3]

Early identification of symptoms is an important component of care for the effective management of delirium.[43] In this context, the use of the following tools is recommended, which include the "Confusion Assessment Method for the Intensive Care Unit-CAM-ICU" and the "Intensive Care Delirium Screening Checklist – ICDSC" for the early diagnosis of postoperative delirium, and the "Neelon and Champagne Confusion Scale," the "Richmond Agitation-Sedation Scale," and the "Nursing Delirium Screening Scale-Nu-DESC" for the assessment of the mental state of the patient.[3,4,25,44]

Delirium treatment should be planned according to the etiological cause. The pharmacological management of postoperative delirium requires a careful selection of medications to be used for the treatment of the geriatric patient. Medication use should be minimized as much as possible.[45] Before administering a neuroactive drug, the nurse should consider all factors (organic and metabolic causes, presence of invasive tools, pain, etc.) that may contribute to the development of delirium.[37] Patients should be monitored according to the recommendations of the Clinical Practice Guideline for Postoperative Delirium in Older Adults, which includes the following recommendations[46]:

- High-risk medications that may induce delirium should be avoided (Level of Evidence: High)
- For geriatric patients not routinely taking cholinesterase inhibitors, cholinesterase inhibitors should not be newly prescribed for the prevention or treatment of delirium in the perioperative period (Level of Evidence: High)
- Benzodiazepines should not be used as the first-line treatment for delirium-related agitation (Level of Evidence: High)
- Antipsychotics and benzodiazepines should be avoided in the treatment of hypoactive delirium (Level of Evidence: High).

Only a few randomized controlled studies are available in the literature investigating the roles of pharmacological agents (antipsychotics) in the prevention of delirium.[17] In a study on mechanically ventilated patients, groups treated with either ziprasidone or haloperidol or placebo were compared. The study reported that none of the antipsychotic agents improved brain function.[47] Wang et al[48] reported that, in their study, delirium developed less in the group of patients, who were given haloperidol, compared to the group that was not treated with haloperidol. Therefore, it is reported that more evidence is needed to recommend the routine use of antipsychotic agents for the prevention of delirium in the intensive care unit.[17]

Non-pharmacological methods are as effective as pharmacological methods in the prevention of postoperative delirium. Nurses assume a great responsibility in this regard. Because nurses closely observe patients during treatment and care processes, they can identify the triggering factors of delirium early and prevent the development of overt symptoms. If delirium develops, nurses can

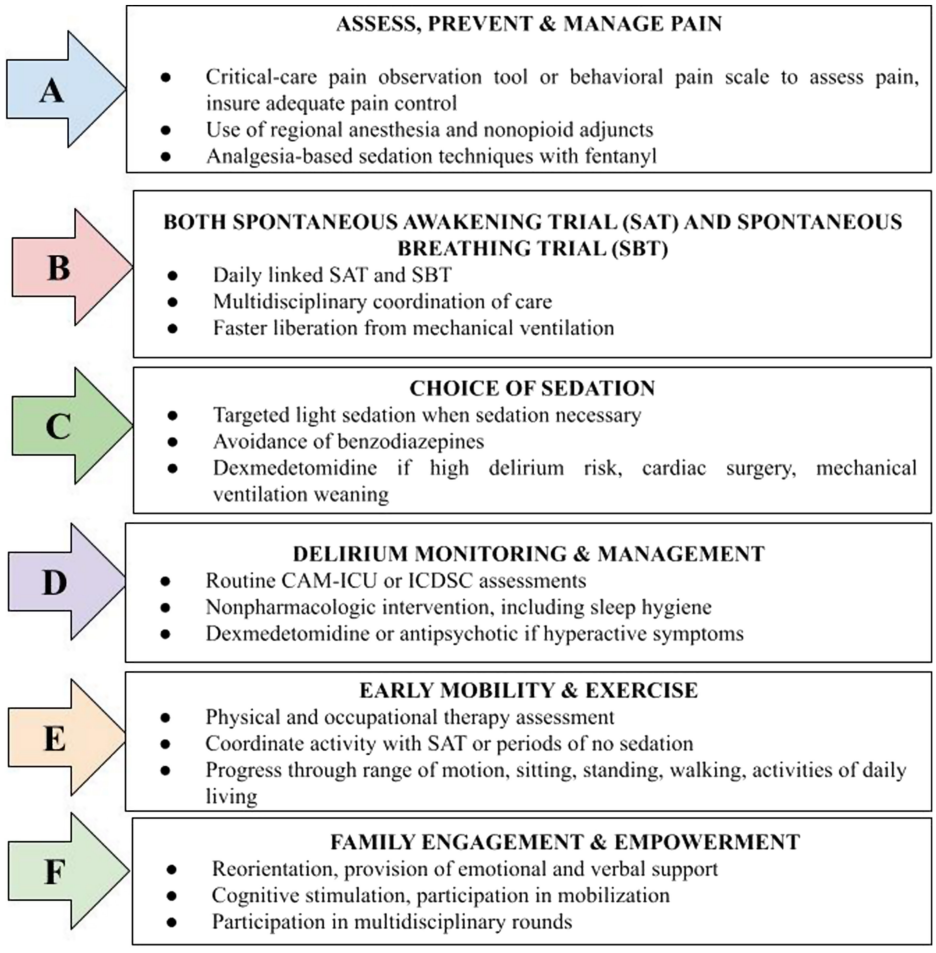

Figure 2. "ABCDEF" care package.

make significant contributions to the development of an appropriate treatment protocol and the provision of proper care before the development of secondary complications. Furthermore, teamwork and the provision of training for each member of the team are vital for effective delirium management.[49] The American Geriatrics Society Clinical Practice guideline recommends non-pharmacological intervention programs to be provided by a multidisciplinary team (comprising doctors, nurses, and other healthcare professionals) for the prevention of the development of postoperative delirium in geriatric patients at risk and undergoing surgery.[20] Again, in the Clinical Practice Guideline for Postoperative Delirium in Older Adults, multicomponent non-pharmacological methods are recommended similarly to be performed by the multidisciplinary team when the diagnosis of postoperative delirium is made in older patients **(**Level of Evidence: Low).[46]

Non-pharmacological interventions include behavioral interventions, the use of monitoring devices, rehabilitation, environmental adaptation, psychological and social support, reduced pharmacological treatment, the use of complementary and alternative medicine, and modifications in systems and processes.[20] Non-pharmacological strategies for the prevention of delirium include sensory enhancement (eyeglasses, hearing aids, or headphone amplifier care), encouragement for mobility (ambulatory activity at least twice daily), cognitive orientation and therapeutic activities, cognitive stimulation, the establishment of simple communication standards, monitoring the intake of adequate foods and fluids, sleep enhancement (non-pharmacological sleep protocol/sleep hygiene), appropriate medication management, and interdisciplinary team collaboration for improved interventions.[50] Abraha et al[51] recommended non-pharmacological methods to prevent delirium in older patients. These recommendations are listed below:

- The use of non-pharmacological methods to prevent delirium in patients aged 65 and over undergoing emergency surgery includes early mobilization, adequate hydration and nutrition, supplementary oxygen delivery, pain control, checking for the early start of bladder and bowel function, and treatment of major postoperative complications (Level of Evidence: (Moderate)
- To prevent delirium in patients over 65 years of age at moderate-to-high clinical risk of developing delirium, a clock and familiar objects should be present in the room, extended visitations should

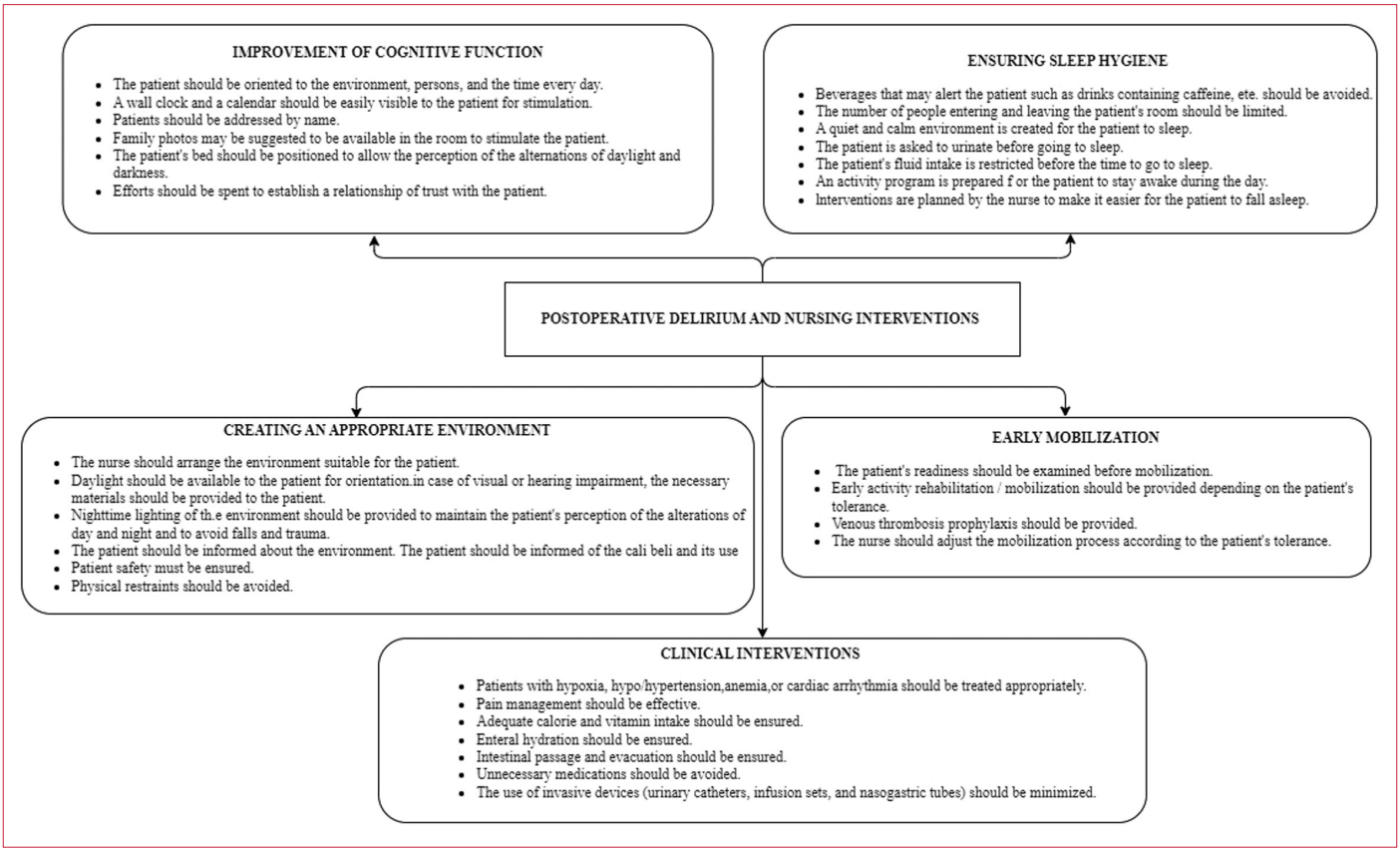

Figure 3. Non-pharmacological nursing interventions in the management of postoperative delirium.

be allowed, and sensory deprivation should be avoided (Level of Evidence: Low)

- Multicomponent non-pharmacological interventions should be employed in the treatment of delirium in patients aged 65 years and older presenting with a diagnosis of delirium (Level of Evidence: Very Low)
- Staff training should be provided for the prevention of delirium in hospitalized patients (Level of Evidence: Low)
- Bright light therapy should not be used to prevent delirium in older surgical patients admitted to the intensive care unit (Level of Evidence: Very Low)
- Earplugs should not be used to prevent delirium in patients aged 65 and over, who were admitted to the intensive care unit (Level of Evidence: Low)
- Music therapy can be used to prevent delirium in older surgical patients admitted to the intensive care unit (Level of Evidence: Very Low)
- A reorientation protocol should be used to prevent delirium in medical or surgical patients aged 65 and over, who were admitted to the intensive care unit (Level of Evidence: Very Low)

As shown in Figure 3, similar to the results of the study by Abraha et al, other recommendations are available in the literature regarding the use of non-pharmacological nursing interventions in the management of postoperative delirium.[3,19,25,28,37,52]

Conclusion

Post-operative delirium in geriatric patients is one of the postoperative complications leading to increased mortality and morbidity rates and unfavorable effects on the quality of life in the post-operative period. Nurses occupy a key role in the early diagnosis and prevention of postoperative delirium as health-care professionals having the most extensive contact with patients for the provision of nursing care. In this review, nursing interventions for the prevention of postoperative delirium in older patients, who constitute one of the risk groups for postoperative delirium, are highlighted in line with current and evidence-based information. In this context,

- First of all, nurses and other healthcare professionals should be trained in this field for the prevention, early diagnosis, and uneventful treatment of postoperative delirium in geriatric patients
- Current and evidence-based practices should be integrated into clinical practice
- Multicenter studies with large sample sizes should be performed

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