Development of a Self-Directed Learning Resource on the Prevention, Identification, and Management of Postoperative Delirium for Nurses Working in Acute Surgical Settings

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Abstract

Background: Postoperative delirium (POD) is a sudden decline in cognitive function that presents following surgical intervention and may result in confusion, inattention, and agitation. This syndrome is often under-recognized and under-treated in postoperative clinical settings. Contributing to this issue is the lack of formal education for nurses about POD. **Purpose:** To develop a self-directed learning resource focused on the prevention, identification, and management of POD for nurses working in acute surgical settings. **Methods:** 1) an integrative literature review, 2) an environmental scan of available resources from hospitals within Atlantic Canada and reputable websites, 3) consultation interviews with key stakeholders, and 4) the development of the self-directed learning resource. **Results:** Findings from the methods established the need for the learning resource. The literature revealed that POD is a substantial issue and there is a knowledge gap for nurses on this topic. The effectiveness of education programs for nurses, use of validated screening tools, and implementation of prevention and management protocols were also noted. The environmental scan resulted in several reputable online resources that are relevant to POD care. Consultation interviews reinforced the demand for the resource and highlighted the learning needs of the nursing staff. The self-directed learning resource was developed based on these findings. The six modules within the resource are: 1) Overview of POD, 2) Prevention of POD, 3) Early Identification of POD, 4) Management of POD, 5) Patient and Family Education, and 6) Self-Care and Stress Management. Within the modules there are case studies, reflection exercises, documentation tips, and videos about POD. **Conclusion:** The aim of the learning resource is to educate staff nurses working in postoperative settings so they can provide evidence-informed nursing care. The learning resource will ideally be made available within the organization's learning management system.

Key Words: *postoperative delirium, delirium, postoperative care, self-directed learning*

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Delirium is a complex, sudden decline in cognitive function that may result in several clinical features, including agitation, drowsiness, inattention, and confusion (Inouye et al., 2014). Patients experiencing delirium often fluctuate between these symptoms of cognitive disturbance and periods of lucidity. The condition is multifactorial, as causes of delirium are related to both predisposing factors (e.g., older age) and precipitating factors (e.g., infection; Inouye et al., 2014; Schenning & Deiner, 2015). Delirium that presents following surgical intervention is known as postoperative delirium (POD) and is a common complication among elderly individuals, with incidence rates noted to be as high as 30.7% (Silva et al., 2021). High incidence rates are especially concerning as POD has been associated with delayed recovery, long-term cognitive decline, and death (American Geriatrics Society [AGS], 2014; Bai et al., 2020; Schenning & Deiner, 2015).

Many POD cases are thought to be avoidable through preventative actions (e.g., pain control) by healthcare professionals (AGS, 2014). However, when patients present with POD it can often be unrecognized due to the fluctuating nature of the condition. Furthermore, treating POD in an acute surgical setting presents several challenges as healthcare professionals must provide usual postoperative care while simultaneously managing symptoms of the condition. In acute surgical settings, nurses are the healthcare professionals who spend the most time with postoperative patients and are in an ideal position to implement preventative interventions, identify symptoms consistent with POD, and collaborate with other disciplines to manage the condition. However, nurses must possess the knowledge and confidence to care for this patient population so they can deliver quality care.

The setting for this practicum project is an orthopedic unit in a larger city hospital in an Atlantic Canadian province. The unit cares primarily for an older adult population that often

faces complex health and social issues. Postoperative delirium is a complication that is often seen amongst these patients after surgical intervention and substantially impacts the unit. This report provides a summary of the objectives and methods for the practicum project, in which a learning resource was developed for nursing staff on the topic of POD.

Objectives

The goal of this practicum project was to develop a learning resource on the prevention, identification, and management of POD that can be utilized by staff nurses working in acute surgical settings.

The key practicum objectives were:

1. Identify staff learning needs and noted issues with caring for patients with POD on this unit;
2. Identify strategies to address issues related to the nursing care of at-risk patients and those experiencing POD;
3. Develop a resource that includes pertinent information about POD, nursing interventions that can be implemented by staff nurses, and communication strategies for educating patients and families; and
4. Demonstrate advanced nursing practice competencies.

Overview of Methods

Several methods were utilized to aid in the development of the learning resource. An integrative literature review, environmental scan, and consultation interviews were conducted to identify learning needs, resource content, and preferred delivery methods. Findings from the literature review confirmed that POD is indeed a substantial issue, and there was a noted knowledge gap for nurses, patients, and patients' families. The review focused on improving

POD care through educational interventions for these groups, assessment of validated screening tools, and implementation of prevention and management protocols.

An environmental scan was performed in which several resources were reviewed. These included policies, protocols, and educational materials from hospitals within Atlantic Canada and those available online from reputable websites. This process revealed valuable information for the resource content and confirmed that there was no singular comprehensive resource already available that met the needs of the staff on the unit. Consultation interviews were then conducted with key stakeholders which confirmed there were several learning needs and knowledge gaps related to POD. Through the interviews, the key stakeholders voiced their opinions on the content and delivery of the learning resource.

Findings from the literature review, environmental scan, and consultation interviews confirmed the need for a learning resource on POD for nurses working in acute surgical settings. These methods provided valuable information about what content should be included within the resource and effective strategies for delivering this information. The data retrieved through these methods was utilized to develop the learning resource and meet the objectives of the practicum project.

Summary of the Literature Review

An integrative literature review was conducted in which the CINAHL, PubMed, MEDLINE, Cochrane library, and Google Scholar databases were searched for articles from scholarly, peer-reviewed journals that studied POD. Searches contained various combinations of keywords including postoperative delirium, delirium, nursing, family, education, prevention, identification, and management. While POD was the focus of the review, medium and high-quality studies regarding delirium in nonsurgical patients were considered in areas where there

was limited information available. This was decided as there are several causes of delirium within the postoperative period that may be unrelated to surgical intervention (e.g., urinary tract infection). A total of 28 articles were selected to inform the review with quantitative and qualitative studies analyzed using the Public Health Agency of Canada (2014) critical appraisal tool kit and the Critical Appraisal Skills Programme (2018) checklist, respectively. A full copy of the literature review can be found in Appendix I of this report.

Significance of the Problem

Of the 28 articles chosen, 13 were utilized to determine the significance of the problem. It was determined that POD is a substantial issue with a negative impact for patients, families, nurses, and the healthcare system at large. Postoperative delirium has been noted to have both high incidence (i.e., up to 30.7%) and prevalence rates (i.e., up to 32%) among elderly individuals undergoing surgical intervention (Koirala et al., 2020; Silva et al., 2021). Compounding this issue is the rapidly growing proportion of older adults (i.e., age 65 or older) in Canada, which is expected to reach 23% of the total population by 2030 (Government of Canada, 2021).

Postoperative delirium has been noted to negatively impact patients, as the condition is associated with an increased risk of mortality in the months following surgery (Bai et al., 2020). Patients who have recovered from POD have also described their experiences as traumatic due to terrifying hallucinations, feelings of impending doom, and a burden of shame for their behaviour while cognitively impaired (Lingehall et al., 2015; Pollard et al., 2015). While this can also be a challenging time for patients' families, it has been noted they can often be a source of comfort for patients and help them become more lucid.

Nurses caring for patients with POD have described their experiences as challenging due to a lack of resources, increased workload, and abuse from patients (i.e., physical and verbal; Thomas et al., 2020). These issues contributed to feelings of both physical and emotional exhaustion. This burden has also been observed at a systemic level, as patients with POD have been noted to have significantly higher healthcare costs than those unaffected after surgery (Guo et al., 2021). These costs were mostly associated with increased length of stay, ICU care, rehospitalization, and transfers to rehabilitative facilities.

Further contributing to the problem of POD is the lack of knowledge amongst nurses and families. It has been noted that many nurses feel unprepared to care for this patient population due to a lack of formal education on POD (Oberai et al., 2019; Thomas et al., 2021). Risk factors, symptoms, medications, use of screening tools, and identifying POD superimposed on dementia were topics noted in the literature to be areas in which there was a knowledge gap or nurses expressed a desire for further education (Meako et al., 2011; Oberai et al., 2019; Thomas et al., 2019). The nurses voiced their concerns about a lack of preventative care, under recognition of cases, and inconsistent management of POD (Oberai et al., 2019; Sturm et al., 2019). It was also noted by nurses that patients' families require further education from nursing staff, which should ideally be completed prior to the onset of POD symptoms (Oberai et al., 2019; Strum et al., 2019).

Interventions

The remaining 15 articles were studies in which systematic reviews were conducted or interventions were implemented to address the issue of POD. These studies covered several areas related to POD which included education (i.e., nurses, families, and patients), early identification, and prevention and management protocols.

Educational Interventions

Two medium-quality systematic reviews were noted which assessed intervention studies related to delirium education for healthcare professionals (Sockalingham et al., 2014; Yanamadala et al., 2013). Sockalingham et al. (2014) stated that interventions that utilized in-person lectures as either the sole strategy or in combination with self-learning modules, group discussions, or workshops were effective in providing delirium education. These interventions were effective in one or more outcomes including improved knowledge scores, enhanced documentation, and reduction in delirium rates. Similarly, Yanamadala et al. (2013) noted that self-learning modules, in-person lectures, group discussions, and workshops were effective delivery methods for delirium education interventions. They also noted studies that combined predisposing (i.e., distribution of information), enabling (i.e., provision of resources), and reinforcing factors (i.e., feedback from peers and experts) achieved more significant results from their educational interventions. More recently, one medium-quality non-randomized controlled trial (NRCT; Guo and Fan, 2016) and one medium quality cohort study (Choi et al., 2019) implemented educational interventions for nurses and noted a reduction in POD rates. The findings from these studies demonstrated that there was strong evidence to suggest that the learning resource should be delivered as either an in-person lecture, self-learning module, workshop, or group discussion and should include predisposing, enabling, and reinforcing factors with the goal of improving knowledge scores and reducing POD rates.

Nurse-led educational interventions for families were noted to be effective in reducing POD rates or improving POD knowledge scores. The medium-quality randomized controlled trial (RCT) by Wang et al. (2020) reported that a family-based protocol consisting of several prevention techniques (e.g., early mobilization) was effective in reducing POD rates. In the

uncontrolled-before-after (UCBA) study by Bull et al. (2016), an educational intervention to help families identify POD was effective in improving knowledge scores. While further medium and high-quality studies of strong design are needed, there is evidence to suggest that nurse-led education for families of high-risk patients may improve early detection and reduce POD rates.

Nurse-led patient education interventions related to POD noted differing results about the effectiveness in reducing POD rates. Two medium-quality RCTs by Chevillon et al. (2015) and Xue et al. (2020) implemented similar educational interventions, while only Xue et al. (2020) noted significantly reduced rates of POD in their intervention group. At present, there is only weak evidence to suggest that patient education may reduce POD and further medium and high-quality studies of strong design are needed. However, patients should still be informed about potential postoperative complications and nurses should be aware that providing this education may help to improve outcomes for patients.

Early Identification of Postoperative Delirium

A medium-quality systematic review conducted by van Velthuijsen et al. (2016) analyzed the feasibility, validity, and reliability of delirium screening tools utilized in 37 quantitative studies. Of the numerous instruments evaluated, the CAM was noted to be one of the most common tools with high sensitivity and specificity, though its feasibility was questioned as it has been deemed time consuming and complicated. The Nurse Delirium Screening Scale (Nu-DESC) was determined to be more feasible, while still having high sensitivity and specificity. Two medium-quality cohort studies (Brooks et al., 2014; Todd et al., 2015) that were not included in the systematic review sought to evaluate nursing staff compliance with the CAM after receiving education about the tool. Both studies noted high rates of compliance, suggesting that the screening tool may indeed be feasible for nursing practice. While these findings were conflicting,

they were still integral to the development of the learning resource. The CAM is utilized within the organization and education regarding this screening tool may help to improve compliance.

Prevention and Management Interventions

Four studies with nurse-led prevention protocols were analyzed which included one high-quality RCT (Chen et al., 2017), one medium-quality NRCT (Guo & Fan, 2016), and two medium-quality controlled-before-after (CBA) studies (Kratz et al., 2015; Zhang et al., 2017). While the combination of prevention strategies differed amongst the protocols, sleep promotion and orientation techniques were the most common strategies noted. Each of the studies noted a significant reduction in POD rates associated with the implementation of their unique prevention protocol (Chen et al., 2017; Guo & Fan, 2016; Kratz et al., 2015; Zhang et al., 2017).

Prevention protocols were delivered by interdisciplinary teams in the medium-quality RCT by Guo et al. (2016) and the medium-quality cohort study by Choi et al. (2019). Sleep promotion, sensory assistance, and orientation techniques were prevention strategies noted in both prevention protocols. Both studies noted significantly lower rates of POD in their intervention groups when compared to the control groups (Choi et al., 2019; Guo et al., 2016). Overall, there is strong evidence to suggest that prevention strategies delivered either solely by nurses or by the interdisciplinary team are effective in reducing rates of POD in acute surgical settings. These findings highlighted the need for education within the learning resource regarding prevention strategies and how to effectively implement them into nursing practice.

Adult Learning Theory

The methods utilized for the practicum project were influenced by Knowles' (1984) Adult Learning Theory. This theory also guided the development of the learning resource. Knowles' theory suggests that adults are motivated to learn by drawing on personal experiences

and applying new knowledge to solve problems (Candela, 2020). Adults often seek to learn information they deem valuable and meaningful activities are useful educational strategies. Therefore, reflective exercises and case studies were incorporated into the learning resource.

Adults may have preferences in their personal learning style but are often motivated and self-directed in their learning (Candela, 2020). Learning needs and preferred delivery methods were discussed in consultation interviews with key stakeholders as to include them in the development of the resource and identify topics of importance. Knowle's (1984) theory is consistent with the findings from the medium-quality systematic reviews by Sockalingham et al. (2014) and Yanamadala et al. (2013) in which self-learning modules were identified as an effective delivery method for delirium education.

Summary of the Environmental Scan

An environmental scan was conducted to identify any existing policies, protocols, or educational materials utilized within hospitals across Atlantic Canada or available from reputable Canadian or international websites. Nine managers or nurse educators from hospitals in larger city centres across Atlantic Canada were emailed to request copies of any policies, protocols, or educational material used within their facility related to the care of patients with POD. Only one of these individuals provided material, which was an orientation PowerPoint slideshow that covered several complications seen in the post-anesthesia care unit (Price, n.d.). Of these complications, emergence delirium was discussed. This resource was informative and helped provide insight into the topic of postoperative delirium. However, it was not specific enough to utilize or adapt for the development of the practicum project.

Seven websites were then analyzed that shared educational information for healthcare professionals or families of patients experiencing delirium. The environmental scan also included

an updated organizational delirium management protocol that was released after the initiation of this practicum project (Babb et al., 2021). A full copy of the environmental scan report can be found in Appendix II.

From each of these sources, there were several common themes that were noted and included as content within the learning resource. It was suggested that ongoing education for healthcare professionals about POD should include symptoms, causes, risk factors, and outcomes (AGS, 2014; American Nurses Association [ANA], n.d.; Moyle, 2020, Ontario Health [OH], n.d.; Registered Nurses Association of Ontario [RNAO], 2016). Numerous prevention strategies were identified that should be implemented into nursing practice, including sleep promotion, early mobility, and orientation techniques (AGS, 2014; ANA, n.d.; Moyle, 2020; OH, n.d.; RNAO, 2016). It was also noted that frequent assessment using validated screening tools was the most effective method for early identification of POD (ANA, n.d.; Babb et al., 2021; OH, n.d.; RNAO, 2016).

Management of POD was focused on interdisciplinary protocols seeking to treat any underlying causes, along with the continuation of prevention strategies (e.g., sleep promotion; AGS, 2014; Babb et al., 2021; Moyle, 2020; OH, n.d.; RNAO, 2016). Finally, the importance of educating families about POD and ways to include them within patient care were highlighted by several resources (ANA, n.d.; Babb et al., 2021; Canadian Coalition for Seniors' Mental Health [CCSMH], 2009; Nova Scotia Health Authority [NSHA], n.d.; OH, n.d.; RNAO, 2016). Through this environmental scan, it was determined that there was no resource available that adequately met the learning needs of the surgical nurses on this unit and could be adapted or adopted for use. Therefore, there was a need to develop a new resource that is comprehensive and relevant for the nurses working within this program.

Summary of the Consultations

Consultation interviews were completed with eight key stakeholders to discuss their experiences and learning needs associated with POD. Three novice nurses, three experienced nurses, one patient care facilitator, and one clinical educator participated in the interview process. Both the patient care facilitator and clinical educator were referred to as consultants throughout the report to further protect confidentiality. The semi-structured interviews were conducted over the phone with each individual participant and consisted of open-ended questions to gain insight on information to be used in the development of the learning resource. Through content analysis, three themes were identified and explored. These were titled issues, resource content, and delivery method. A full copy of the consultation report can be found in Appendix III.

Issues

Limited education, confidence, workplace stress, and organizational issues were all concepts related to the overarching theme of issues. The nurses explained that there had been minimal, or no education received on POD during their orientation to the surgery program or the specific unit. They also noted there were limited ongoing educational opportunities available related to POD and no singular, comprehensive resource that met all their learning needs. Several nurses described feeling overwhelmed and unprepared when they first began working on the unit. This was further compounded by workplace stress related to POD including patients' impulsive behaviour, physical abuse, maintaining patient safety, and increased workload. Each of the participants agreed that there were organizational issues that complicated the care of patients with POD, such as staffing concerns and delayed transfers to more appropriate care settings (e.g., rehabilitation).

Resource Content

Through the interview process, several learning needs were discussed by the participants as potential topics for the learning resource. Knowledge gaps were also noted through an analysis of the data. These were discussed in relation to the concepts of prevention, identification, and management of POD, and involvement of families. In terms of prevention of POD, the nurses identified that they desired further education on medications that can contribute to delirium in elderly patients. They also noted that they wanted education about prevention strategies (e.g., sleep promotion) and how to practically implement them within their practice.

Regarding the identification of POD, several nurses noted that they were not always confident when patients presented with hypoactive symptoms (e.g., drowsiness) or delirium superimposed on dementia. Several participants revealed that they were not confident in using the Confusion Assessment Method (CAM) screening tool or received questions from other staff members about how to properly use the tool. For proper management of POD, the nurses identified that de-escalation of agitated patients, avoidance of restraints, and rationale for protocol interventions were topics that should be addressed by the learning resource. They also noted that stress management and self-care strategies would be beneficial. Finally, providing education to families and ways to incorporate them in patient care were learning needs that were identified by the participants.

Delivery Method

There was some division noted between participants about their preferred delivery method for the learning resource. A few nurses identified that they preferred in-person presentations with group discussions while the remaining nurses noted that self-learning modules were convenient for their busy schedules. It was noted by the participants that a self-learning

module would be most effective if it utilized engaging strategies (e.g., videos) and consisted of several smaller sections that could be completed over time. One consultant also noted how self-learning modules were the new direction for educational interventions within the organization. Overall, the information obtained from the consultation interviews helped to inform both the content and delivery of the self-directed learning resource.

Summary of the Resource

Findings from the literature review, environmental scan, and consultation interviews were utilized to develop a self-directed learning resource. The resource is titled *Prevention, Identification, and Management of Postoperative Delirium: A Self-Directed Learning Resource for Nurses Working in Acute Surgical Settings* and a copy can be found in Appendix IV of this practicum report. The resource contains evidence-informed information about the prevention, identification, and management of POD. The self-directed approach was decided based on the preferences noted in the consultation interviews. This delivery method was consistent with findings from the literature regarding delirium education (Sockalingham et al., 2014; Yanamadala et al., 2013). Educational strategies included predisposing (i.e., evidence-informed POD information), enabling (i.e., provision of the learning resource), and reinforcing (i.e., feedback from tests and case studies) factors to enhance learning, based on findings from the literature review.

Knowles' (1984) Adult Learning Theory guided the development of the self-directed learning resource, as adults often seek to learn information that is valuable to them. Adult learners draw on personal experiences and meaningful activities (e.g., reflection exercises) are often effective educational strategies (Candela, 2020). They are also self-directed in their

learning, which was consistent with findings from the literature review and consultation interviews.

The learning resource was divided into six smaller modules based on recommendations noted by the key informants. Each module contains learning objectives, images, and figures. Throughout the modules there are reflection activities, important reminders, documentation tips, case studies, and videos obtained from public domains to supplement the readers' learning. There is also a pretest and post-test at the beginning and end of the resource, respectively, to allow the reader to evaluate their learning. Each module was designed so that it can be utilized in orientation for newly graduated nurses but will also provide valuable knowledge to experienced nurses already working within the surgery program.

Module One: Overview of Postoperative Delirium

The first module provides a general overview of POD. This includes a definition, clinical features, delirium subtypes, diagnostic criteria, causes, and outcomes. There is a description of patient experiences noted within the literature and a video that highlights one individual's experience. Challenges faced by nurses caring for this patient population are also explored. There is a case study at the end of the module that allows the reader to evaluate their learning about factors linked to POD and symptoms associated with the subtypes of delirium.

Module Two: Prevention of Postoperative Delirium

This module focuses on nursing interventions that can assist in preventing POD. Several strategies are outlined, including pain management, early mobility, family involvement, and several others. There is rationale provided and tips for how to effectively implement these strategies into nursing practice. Medications that should be avoided in patients who are high-risk for developing POD are outlined. There is also a reflection activity that encourages the reader to

consider how they can incorporate these strategies into their practice. The case study at the end of the module encourages the learner to consider how they can implement prevention strategies both preoperatively and postoperatively for a patient who is at a high risk for developing POD.

Module Three: Early Identification of Postoperative Delirium

Cognitive assessment for the early identification of POD is highlighted in module three. The importance of determining the patient's baseline cognition and using validated screening tools to assess for changes is discussed. The CAM is highlighted as it is the screening tool utilized within the organization. The reader can explore the features of the tool and learn how to determine if a patient is likely experiencing POD. The actions and documentation that should be completed once a patient is determined to be CAM positive are described within the module. There are also tips to address concerns related to the identification of POD, such as recognizing hypoactive delirium. The case study for this module allows the learner to practice using the CAM to identify POD in three different cases.

Module Four: Management of Postoperative Delirium

Module four focuses on the effective management of POD in the surgical setting. The organizational protocol for delirium management is discussed and rationale is provided for both pharmacologic and nonpharmacologic measures. Within the module there are communication strategies, de-escalation techniques, and safety measures to utilize when caring for patients experiencing POD. The case study provided at the end of module allows the learner to apply their knowledge.

Module Five: Patient and Family Education

In this module, the importance of providing POD education to patients and their families is highlighted. Methods for delivering this education are discussed and include verbal, written,

and electronic options to accommodate various learning needs. The learner is also taught what information is important to include within the education they provide. There are suggestions for how to include families within patient care regarding prevention, identification, and management of POD. Finally, readers are encouraged to evaluate their learning through a case study which reviews the material covered in the module.

Module Six: Self-Care and Stress Management

The final module provides an overview of how to cope with workplace stress through self-care and stress management. This module was created in response to the learning needs noted from the consultation interviews with staff nurses. They identified that they often experienced workplace stress related to caring for patients with POD and sought ways to alleviate this stress. In the beginning of the module, there are tips for how to practice self-care and stress management in the workplace (e.g., taking assigned breaks). There are also practical tips for outside of the workplace that encourage the learner to explore their mental, physical, and emotional health. At the end of the module there is a reflection activity for the reader to consider how they currently manage their stress and ways they can focus on self-care to improve their wellbeing.

Discussion of Advanced Nursing Practice (ANP) Competencies

The Canadian Nurses Association (CNA) has developed an advanced practice nursing framework to guide consistent role implementation and development for clinical nurse specialists and nurse practitioners. Outlined in the framework are six advanced nursing practice (ANP) competencies which include direct comprehensive care, optimizing health systems, educational, research, leadership, and consultation and collaboration. Through the development of this practicum project, elements from some of these competencies have been demonstrated.

Optimizing Health System Competencies

Advanced practice nurses promote competent client-centered care and support the function of health systems (CNA, 2019). This can be done through integrating new nursing knowledge and executing improvements to existing processes. For this practicum project, I have developed a resource for staff nurses that outlines evidence-informed nursing interventions for the care of patients with POD. This education is not currently provided within orientation to the surgery program at this hospital. The goal is that the learning resource will help to enhance POD knowledge and nursing care within the program.

Research Competencies

Research evidence is conducted, synthesized, appraised, and utilized by advanced practice nurses (CNA, 2019). When conducting the literature review, research was evaluated and synthesized to inform the development of the learning resource. I was also able to practice research methods when conducting consultation interviews, as I collected and protected the interview data and then analyzed the findings to further the development of the learning resource. As well, data from the environmental scan was collected and synthesized to determine commonalities across several sources of POD information.

Leadership Competencies

Advanced practice nurses seek new and effective practices that improve care within the communities and organizations they serve (CNA, 2019). This may involve evaluating existing approaches or developing new methods of targeting issues. I recognized issues within the workplace regarding the lack of POD education and through this project sought to implement a new learning resource that can improve nursing practice. I was committed to developing a

resource that would be valuable for the program and worked with key informants to ensure it met their learning needs.

Educational Competencies

Advanced practice nurses work to ensure effective learning for clients and families, as well as professional growth for all healthcare providers (CNA, 2019). Through this practicum project I have expanded my knowledge on the topic of POD and learned how to properly utilize several methods for data collection (e.g., consultation interviews). I was able to use this information to develop an evidence-informed self-directed learning resource. This has resulted in both professional and academic growth. I have applied teaching and learning principles to the learning resource, which will be used to educate other staff nurses about POD. This will include both newly hired nurses orientating to the surgery program and current staff who are looking to further their knowledge.

Next Steps

After completion of this practicum project, the learning resource will be shared with the unit manager for review and approval to distribute to the nursing staff. Upon approval, the resource will be made available to current nursing staff on the unit as an email attachment. Copies of the resource will also be made available on the computers on the unit. A request will be made to make the learning resource available to all staff within the health authority through the learning management system. The resource will also be shared with the clinical educator so that it can be assessed for inclusion within orientation to the surgery program. While the resource will initially only be available in one health authority, the goal would be to make it adaptable for use in the remaining health authorities throughout the province.

Evaluation of the learning resource will include monitoring of staff feedback and nursing care provided within the surgery program. Feedback about the resource will be achieved through an online survey that can be linked within the document. Staff members will be asked about whether they found the resource useful and their ability to implement the strategies outlined in the modules. They will also have the opportunity to provide recommendations for improvement. The results can be monitored by the clinical educator once the resource has been implemented.

Chart audits would be recommended to monitor nursing care and patient outcomes before and after the implementation of the learning resource. These could begin approximately one month after the resource is implemented within the learning management system and be completed once every quarter. Any changes in the use of preventative strategies and rates of POD should be monitored. This would also be done to determine if there is any improvement in compliance with the CAM tool and if it is being used properly to detect and report POD. In addition, it would be helpful to analyze any changes in the number of staff injuries or violent incidents related to POD before and after implementation of the resource.

Building on the current project, future work would be directed at strengthening preventative care for patients who are at a higher risk of developing POD. This is particularly important as many cases of delirium are thought to be preventable and a reduction in POD rates would be beneficial for postoperative patient outcomes. As previously noted, POD has been associated with delayed surgical recovery, traumatic experiences, long-term cognitive decline, and death (AGS, 2014; Bai et al., 2020; Lingehall et al., 2015; Pollard et al., 2015; Schenning & Deiner, 2015). Reducing the rates of POD could also help to reduce the risk of patients experiencing these poor outcomes after surgery. Evidence-informed information contained

within this learning resource could be used to develop a policy focused on delirium prevention strategies. This would likely help to reduce the rates of POD seen in this patient population.

Conclusion

Postoperative delirium has been noted to have detrimental outcomes for patients, including delayed recovery, long-term cognitive decline, and death (AGS, 2014; Bai et al., 2020; Schenning & Deiner, 2015). This syndrome is often under-recognized and under-treated in postoperative clinical settings and there has been a lack of formal education for nurses noted in the literature. The purpose of this practicum project was to develop a learning resource for staff nurses working in acute surgical settings that focused on the prevention, identification, and management of POD. This was to help address any knowledge gaps and hopefully improve patient care.

Methods for the project included a literature review, environmental scan, and consultation interviews with key informants. Findings from these methods revealed valuable information about POD and insight into the learning needs of the staff nurses. Working through this project has also allowed for the growth and demonstration of ANP competencies. These include research, leadership, educational, and optimizing health system competencies.

The implementation and evaluation of the learning resource will be continued after the completion of this practicum project. Implementation will include submitting the resource for approval within the learning management system of the health authority and orientation to the surgery program. Feedback surveys and chart audits will be used to evaluate the quality of the resource and its effect on several clinical outcomes (e.g., POD rates), respectively. Optimistically, this learning resource may help to increase POD knowledge for staff nurses and

improve nursing care for patients either experiencing POD or at high risk for developing the syndrome.

References

American Geriatrics Society (2014, October 10th). *Clinical practice guideline for postoperative delirium in older adults*. https://www.archcare.org/sites/default/files/pdf/ags-2014-clinical-practice-guideline-for-postop-delirium-in-older-adults.pdf

American Nurses Association (n.d.). *Delirium: Prevent, identify, treat.* https://www.nursingworld.org/practice-policy/work-environment/health-safety/delirium/

Babb, K., Downey, J., & Coffey-Hickey, T. (2021, June 29). *Delirium screening and management (Adult acute care).* [Policy]. Eastern Health.

Bai, J., Liang, Y., Zhang, P., Liang, X., He, J., Wang, J., & Wang, Y. (2020). Association between postoperative delirium and mortality in elderly patients undergoing hip fractures surgery: A meta-analysis. *Osteoporosis International, 31*, 317-326. https://doi.org/10.1007/s00198-019-05172-7

Brooks, P., Spillane, J. J., Dick, K., & Stuart-Shor, E. (2014). Developing a strategy to identify and treat older patients with postoperative delirium. *AORN Journal, 99*(2), 257-273. https://doi.org/10.1016/j.aorn.2013.12.009

Bull, M. J., Boaz, L., Maadooliat, M., Hagle, M. E., Gettrust, L., Greene, M. T., Holmes, S. B., & Saczynski, J. S. (2016). Preparing family caregivers to recognize delirium symptoms in older adults after elective hip or knee arthroplasty. *Journal of the American Geriatrics Society, 65,* 13-17. https://doi.org/10.1111/jgs.14535

Canadian Coalition for Seniors' Mental Health (2009). *Delirium in older adults: A guide for seniors and their families*. https://ccsmh.ca/wpcontent/uploads/2016/03/ccsmh_delirium Booklet.pdf

Canadian Nurses Association (2019). *Advanced practice nursing: A Pan-Canadian*

Framework. Ottawa, ON: Author. Available at: https://www.cna-aiic.ca/-/media/cna/page-content-pdf-en/apn-a-pan-canadian-framework.pdf

Candela, L. (2020). Theoretical foundations of teaching and learning. In D. M. Billings & J. A. Halstead (Eds.). *Teaching in nursing: A guide for faculty*. (pp. 247-269). St. Louis, MI: Elsevier.

Chen, C. C., Li, H., Liang, J., Lai, I., Purnomo, J. D. T., Yang, Y., Lin, B., Huang, J., Yang, C., Tien, Y., Chen, C., Lin, M., Huang, G., & Inouye, S. (2017). Effect of a modified hospital elder life program on delirium and length of hospital stay in patients undergoing abdominal surgery: A cluster randomized clinical trial. *JAMA Surgery, 152*(9), 827-834. https://doi.org/10.1001/jamasurg.2017.1083

Chevillon, C., Hellyar, M., Madani, C., Kerr, K., & Kim, S. C. (2015). Preoperative education on postoperative delirium, anxiety, and knowledge in pulmonary thromboendarterectomy patients. *American Journal of Critical Care, 24*(2), 164-171. https://doi.org/10.4037/ajcc2015658

Choi, J., Kim, K., Kang, M., Lee, Y., Koo, K., Oh, J. H., Park, Y. H., Suh, J., Kim, N., Yoo, H., Koo, J., Moon, H. M., Kim, E. H., Park, K., & Kim, C. (2019). Impact of a delirium prevention project among older hospitalized patients who underwent orthopedic surgery: A retrospective cohort study. *BMC Geriatrics, 19*(1). https://doi/org/ 10.1186/s12877-019-1303-z

Critical Appraisal Skills Programme (2018). *CASP qualitative checklist.* http://publications.gc.ca/collections/collection_2014/aspc-phac/HP40-119-2014-eng.pdf

Government of Canada (2021). *Action for seniors report.* https://www.canada.ca/en/employment-social-development/programs/seniors-action-

report.html#tc2a

Guo, Y. & Fan, Y. (2016). A preoperative, nurse-led intervention program reduces acute postoperative delirium. *Journal of Neuroscience Nursing, 48*(4), 229-235. https://foi.org/10.1097/JNN.0000000000000220

Guo, R. Y., Hshieh, T. T., Marcantonio, E. R., Cooper, Z., Jones, R. N., Travison, T. G., Fong, T. G., Abdeen, A., Lange, J., Earp, B., Schmitt, E. M., Leslie, D. L., & Inouye, S. K. (2021). One-year medicare costs associated with delirium in older patients undergoing major elective surgery. *JAMA Surgery, 156*(5), 462-470. https://doi.org/10.1001/jamasurg.2020.7260

Guo, Y., Sun, L., Li, L., Jia, P., Zhang, J., Jiang, H., & Jiang, W. (2016). Impact of multicomponent, nonpharmacologic interventions on perioperative cortisol and melatonin levels and postoperative delirium in elderly oral cancer patients. *Archives of Gerontology and Geriatrics, 62*, 112-117. https://doi.org/10.1016/j.archger.2015.10.009

Inouye, S. K., Westendorp, R., & G. J., Saczynski, J. S. (2014). Delirium in elderly people. *Lancet, 383*, 911-922. https://doi.org/ 10.1016/S0140-6736(13)60688-1

Knowles, M. (1984). *Andragogy in action: Applying modern principles of adult learning*. Jossey-Bass

Koirala, B., Hansen, B. R., Hosie, A., Budhathoki, C., Seal, S., Beaman, A., & Davidson, P. M. (2020). Delirium point prevalence studies in inpatient settings: A systematic review and meta-analysis. *Journal of Clinical Nursing, 29*, 2083-2092. https://doi.org/10.1111/jocn.15219

Kratz, T., Heinrich, M., Schlaub, E., & Diefenbacher, A. (2015). Preventing postoperative delirium: A prospective intervention with psychogeriatric liaison on surgical wards in a

general hospital. *Deusches Artzeblatt International, 112*, 289-296. https://doi.org/10.3238/arztebl.2015.0289

Lingehall, H. C., Smulter, N., Olofsson, B., & Lindahl, E. (2015). Experiences of undergoing cardiac surgery among older people diagnosed with postoperative delirium: One year follow-up. *BMC Nursing, 14*(17). https://doi.org/10.1186/s12912-015-0069-7

Meako, M. E., Thompson, H. J., & Cochrane, B. B. (2011). Orthopaedic nurses' knowledge of delirium in older hospitalized patients. *Orthopaedic Nursing, 30*(4), 241-248. https://doi.org/10.1097/NOR.0b013e3182247c2b

Moyle, S. (2020). *What is delirium?* Ausmed. https://www.ausmed.com/cpd/articles/postoperative-delirium

Nova Scotia Health Authority (n.d.). *This is not my mom: Information and resources about delirium.* https://www.thisisnotmymom.ca/

Oberai, T., Killington, M., Laver, K., Crotty, M., & Jaarsma, R. (2019). "Just another piece of paperwork": Perceptions of clinicians on delirium screening following hip fracture repair elicited in focus groups. *International Psychogeriatric, 31*(6), 877-884. https://doi.org/10.1017/S1041610218001369

Ontario Health (n.d.). *Quality standards: Delirium care for adults.* https://hqontario.ca/Portals/0/documents/ evidence/quality-standards/qs-delirium-quality-standard-en.pdf

Pollard, C., Fitzgerald, M., & Ford, K. (2015). Delirium: The lived experience of older people who are delirious post-orthopedic surgery. *Mental Health Nursing, 24*, 213-221. https://doi.org/10.1111/inm.12132

Price, C. (n.d.) *PACU: Part 4 common complications*. [PDF]. Labrador-Grenfell Health.

Public Health Agency of Canada (2014, July). *Infection prevention and control guidelines: Critical appraisal tool kit.* http://publications.gc.ca/collections/collection_2014/aspc-phac/HP40-119-2014-eng.pdf

Registered Nurses' Association of Ontario (2016, July). *Delirium, dementia, and depression in older adults: Assessment and care.* https://rnao.ca/sites/rnao ca/files/3Ds_BPG_WEB_FINAL.pdf

Schenning, K. J. & Deiner, S. G. (2015). Postoperative delirium in the geriatric patient. *Anesthesiology Clinics, 33*(3), 505-516. https://doi.org/10.1016/j.anclin.2015.05.007

Silva, A. R., Regueira, P., Albuquerque, E., Baldeiras, I., Cardoso, A. L., Santana, I., & Cerejeira, J. (2021). Estimates of geriatric delirium frequency in noncardiac surgeries and its evolution across the years: A systematic review and meta-analysis. *JAMDA, 22*(3), 613-620. https://doi.org/10.1016/j.jamda.2020.08.017

Sockalingham, S., Tan, A., Hawa, R., Pollex, H., Abbey, S., & Hodges, B. D. (2014). Interprofessional education for delirium care: A systematic review. *Journal of Interprofessional Care, 28*(4), 345-351. https://doi.org/10.3109/13561820.2014.891979

Sturm, H., Wildermuth, R., Stolz, R., Bertram, L., Eschweiler, G. W., Thomas, C., Rapp, M., & Joos, S. (2019). Diverging awareness of postoperative delirium and cognitive dysfunction in German health care providers. *Clinical Interventions in Aging, 14*, 2125-2135. https://doi.org/10.2147/CIA.S230800

Thomas, N., Coleman, M., & Terry, D. (2021). Nurses/ experiences of caring for patients with delirium: Systematic review and qualitative evidence synthesis. *Nursing Reports, 11*(1), 164-174. https://doi.org/10.3390/nursrep11010016

Todd, K. S., Barry, J., Hoppough, S., & McConnell, E. (2015). Delirium detection and improved

delirium management in older patients hospitalized for hip fracture. *International Journal of Orthopaedic and Trauma Nursing, 19*, 214-221. https:/doi.org/10.1016/j.ijotn.2015.03.005

van Velthuijsen, E. L., Zwakhalen, S. M. G., Warnier, R. M. J., Mulder, W. J., Verhey, F. R. J., & Kempen, G. I. J. M. (2016). Psychometric properties and feasibility of instruments for the detection of delirium in older hospitalized patients: A systematic review. *International Journal of Geriatric Psychiatry, 31*(9), 974-989. https://doi.org/10.1002/gps.4441

Wang, Y., Yue, J., Xie, D., Carter, P., Li, Q., Gartganis, S. L., Chen, J., & Inouye, S. K. (2020). Effect of the tailored, family-involved hospital elder life program on postoperative delirium and function in older adults: A randomized clinical trial. *JAMA Internal Medicine, 180*(1), 17-25. https://doi.org/10.1001/jamainternmed.2019.4446

Xue, X., Wang, P., Wang, J., Li, X., Peng, F., & Wang, Z. (2020). Preoperative individualized education intervention reduces delirium after cardiac surgery: A randomized controlled study. *Journal of Thoracic Disease, 12*(5), 2188-2196. https://doi.org/10.21037/jtd.2020.04.26

Yanamadala, M., Wieland, D., & Heflin, M. T. (2013). Educational interventions to improve recognition of delirium: A systematic review. *Journal of the American Geriatrics Society, 61*(11), 1983-1993. https://doi.org/10.1111/jgs.12522

Zhang, W., Sun, Y., Liu, Y., Qiu, W., Ye, X., Zhang, G., & Zhang, L. (2017). A nursing protocol targeting risk factors for reducing postoperative delirium in patients following coronary artery bypass grafting: Results of a prospective before-after study. *International Journal of Nursing Sciences, 4*(2), 81-87. https://doi.org/10.1016/j.ijnss.2017.02.00

Appendices

Appendix I: Literature Review

Literature Review: Development of a resource on postoperative delirium for nurses working in acute surgical settings

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Literature Review

Delirium is a complex, abrupt change in cognitive functioning that results in variable clinical features including confusion, inattention, and agitation (Inouye et al., 2014). While many cases are preventable, delirium is often under recognized by healthcare professionals. Causes of delirium are multifactorial and may include various predisposing factors (e.g., cognitive impairment, older age, or sensory impairment) and precipitating factors (e.g., surgical intervention, medications, or infection; Inouye et al., 2014; Schenning & Deiner, 2015). This further complicates the management of delirium, as several factors may need to be addressed. This is concerning as delirium most often affects elderly individuals and is associated with an increased risk of morbidity and mortality (Inouye et al., 2014).

There are several subtypes of delirium including hyperactive (i.e., presents as aggression and agitation), hypoactive (i.e., presents as drowsiness and decreased motor activity), or mixed delirium (i.e., combination of hyperactive and hypoactive presentations; American Geriatrics Society [AGS], 2014). Delirium that presents early within the postoperative period is noted as postoperative delirium (POD). Postoperative delirium is a common complication among elderly individuals after surgical intervention and can lead to delayed recovery, cognitive decline, or death (AGS, 2014; Schenning & Deiner, 2015).

Postoperative delirium presents a challenge for healthcare professionals as they must provide usual postoperative care while simultaneously managing features of delirium to prevent further complications. Recent literature has primarily focused on preventative measures and the timely identification and management of POD (AGS, 2014). Preventative interventions such as postoperative order sets and delirium protocols aim to reduce incident POD, while screening tools help with early identification and management of the condition. In acute care settings,

nurses are the healthcare professionals who spend the most time with postoperative patients and are in an ideal position to implement preventative interventions and screening tools. The purpose of this literature review is to provide rationale for the proposed resource, as well as guide its content and delivery method. This literature review will demonstrate that there is strong evidence to support the development of a multicomponent educational resource with predisposing (e.g., self-learning module), enabling (e.g., handouts), and reinforcing (e.g., post-test feedback) factors for surgical nurses regarding the prevention, identification, and management of POD.

Search Methods

A literature search was conducted of the CINAHL, PubMed, MEDLINE, Cochrane library, and Google Scholar databases for articles from scholarly, peer-reviewed journals that studied the prevention, identification, or management of POD. Reference lists of relevant articles were also searched to find additional appropriate studies. The research question that guided the search was: "What is known about the impact of nursing knowledge and interventions on the prevention, identification, and management of POD?". Search terms included various combinations of MESH terms including "delirium", "nursing", "family", and "education". Other key search words included "postoperative delirium", "prevention", "intervention", "identification", "detection", "treatment", and "management".

Articles were included in the review if they were English-language, peer-reviewed nursing or allied health research. Research was only considered if it was published within the last ten years (i.e., 2011-2021), as to keep the findings recent and relevant to current healthcare trends. There were no geographical restrictions applied to the search. Medium and high-quality systematic reviews, quantitative studies, and qualitative studies were considered. While POD was the focus of this literature review, some medium and high-quality studies about delirium that

included nonsurgical participants were also considered. This was decided as several causes of delirium in the postoperative period can be unrelated to surgical or postoperative interventions (e.g., urinary tract infection). Articles were excluded if they did not focus on participants from acute care settings. Initial searches of the databases resulted in over 700 articles of which the abstracts were reviewed for relevance. A total of 28 articles were determined to be of relevance and were then assessed for this literature review.

Quantitative and qualitative studies were analyzed using the Public Health Agency of Canada (PHAC; 2014) critical appraisal tool kit and the Critical Appraisal Skills Programme (CASP; 2018) checklist, respectively. Literature summary tables were completed for the studies that implemented POD prevention protocols or educational interventions for nurses (**Chen** et al., 2017; **Choi** et al., 2019; **Guo** et al., 2016; **Guo & Fan**, 2016; **Kratz** et al., 2015; **Meako** et al., 2011; **Zhang** et al., 2017). The names of these authors will appear in bold the first time they are referenced in each subsequent section of this literature review.

Of the 28 articles selected, four medium-quality quantitative systematic reviews (Bai et al., 2020; Koirala et al., 2020; Silva et al., 2021; Watt et al., 2018), one credible qualitative systematic review (Thomas et al., 2021), four credible qualitative studies (Lingehall et al., 2015; Oberai et al., 2019;Pollard et al., 2015; Sturm et al., 2019), three medium-quality cross-sectional studies (DeCrane et al., 2011; Denny & Lindseth, 2020; Guo et al., 2021), and one medium-quality uncontrolled before-after study (UCBA; Meako et al., 2011) were used to determine the significance of the problem. The remaining 15 articles consisted of three medium-quality systematic reviews (Sockalingham et al., 2014; van Valthhuijsen et al., 2016; Yanamadala et al., 2013) and 12 quantitative studies where interventions were implemented to address the issue of POD. These intervention studies were mostly of strong design, including one high-quality

randomized controlled trial (RCT; Chen et al., 2017), four medium-quality RCTs (Chevillon et al., 2015; Guo et al., 2016; Wang et al., 2020; Xue et al., 2020), one medium-quality non-randomized controlled trial (NRCT; Guo & Fan, 2016), and two medium-quality controlled before-after studies (CBA; Kratz et al., 2015; Zhang et al., 2017). There were also three medium-quality cohort studies (Brooks et al., 2014; Choi et al., 2019; Todd et al., 2015) of moderate design and one medium-quality UCBA study (Bull et al., 2016) of weak design.

Significance of the Problem

Postoperative delirium presents considerable challenges in the clinical setting as it can result in poor outcomes for patients and place strain on the healthcare system. The literature revealed that there was a substantial impact of POD and several contributing factors to this issue. Gaps in knowledge for both nurses and patients' families were noted. There were also concerns about a lack of preventative measures, early identification, and management of this challenging postoperative complication.

Incidence

Postoperative delirium has been noted to be a substantial surgical complication, with varying incidence rates depending on several factors, such as the type of surgical procedure (Silva et al., 2021; Watt et al., 2018). Silva et al. (2021) and Watt et al. (2018) conducted medium-quality systematic reviews and meta syntheses of factors related to POD rates among 49 and 41 quantitative studies, respectively. These included a combination of RCTs, NRCTs, and cross-sectional studies. In the medium-quality systematic review of non-cardiac patients, Silva et al. (2021) noted the pooled frequency of POD incidence to be 30.7% (95% Confidence Interval [CI]: 20-34%) in studies that utilized validated diagnostic criteria. It was also noted that the frequency of POD had been steadily rising from 1995 to 2020, though it was not determined if

this was related to an aging population with increasing comorbidities or improved use of validated diagnostic criteria within the literature. Watt et al. (2018) focused on studies with patients undergoing elective surgery in their medium-quality systematic review, which showed a lower incidence rate of POD of 18.4% (95% CI: 14.3-23.3%). The incidence rate also varied by type of surgical procedure. This difference may be attributed to the likelihood that cohorts of patients eligible for elective surgery would possibly be in better physical and cognitive condition preoperatively than those requiring necessary surgeries.

Prevalence

Varying prevalence rates of delirium have been noted across in-patient settings (Koirala et al., 2020). Koirala et al. (2020) conducted a medium-quality systematic review of nine quantitative studies that noted prevalence rates of delirium within in-patient settings including ICUs, medical-surgical units, and palliative care units. These studies came from several countries including Australia, New Zealand, Italy, United Kingdom, Spain, Scotland, and Denmark. The delirium prevalence rates among these studies ranged from nine to 32%. (Koirala et al., 2020). Time points for data collection varied between one day to one week. It was also noted by Koirala et al. (2020) that several studies reported under-screening and under-reporting of delirium in their clinical settings.

No Canadian prevalence rates for POD or delirium were noted within recent literature. However, the proportion of Canadian seniors (i.e., aged 65 and older) is rapidly growing and is expected to reach 23% of the total population by 2030 (Government of Canada, 2021). This is noteworthy, as advanced age has been identified as a substantial risk factor for POD (Inouye et al., 2014; Schenning & Deiner, 2015; Silva et al., 2021). This will continue to be an issue in the coming years, specifically in Newfoundland and Labrador (NL), as the province is projected to

have the highest proportion of seniors within Canada through to 2043 (Statistics Canada, 2020). The percentage of seniors in NL is expected to reach between 30.9% and 35.8% by 2043, compared to only 20.5% which was noted in 2018.

Impact

Postoperative delirium has been noted to have a substantial, negative impact on affected patients and their family members. If family members can comfort and orient patients, they may be able to positively impact patient care. Patients experiencing POD also place a greater strain on nurses and the healthcare system at large. This is often due to the complexity of their care while in acute care settings.

Patients

Postoperative delirium has been noted to have a negative impact for patients who have experienced this complication, as it has been associated with an increased rate of mortality and traumatic experiences (Bai et al, 2020; Lingehall et al., 2015; Pollard et al., 2015). In the medium-quality systematic review by Bai et al. (2020), the pooled results of the cohort studies showed a significant risk of mortality after experiencing POD post-hip fracture fixation at the six-month (Risk ratio [RR]= 2.51, 95% CI 1.99-3.16, $p < 0.001$) and one-year (RR= 1.98, 95% CI 1.62-2.41, $p < 0.001$) time points after surgery.

The experience of POD has also been noted to be distressing for patients. Lingehall et al. (2015) and Pollard et al. (2015) conducted credible qualitative studies in which participants were interviewed about their lived experiences of POD after cardiac surgery (n = 49) and orthopedic surgery (n = 110), respectively. Participants described terrifying hallucinations and feelings of impending doom while they were experiencing POD. Many participants explained that they carried a burden of shame for their behaviour during that time.

Families

Family members may be able to positively impact patient outcomes when experiencing POD (Lingehall et al., 2015; Pollard et al., 2015; Thomas et al, 2021). Thomas et al. (2021) conducted a credible systematic review of qualitative studies (n = 10) regarding the factors that influence nurses caring for patients with delirium. Nurses from these studies worked in a variety of inpatient units, including surgical, medical, palliative care, and intensive care units (ICUs). The studies were conducted in several countries including Canada, Australia, China, United Kingdom, Denmark, and the United States of America. It was noted by the nurses in these studies that families are essential for the management of delirium in the in-patient setting (Thomas et al., 2021). Nurses felt family members were often able to comfort patients and effectively orient them to their surroundings.

In both the credible qualitative studies by Lingehall et al. (2015) and Pollard et al. (2015), participants who had experienced POD described their families as a crucial support system during that time. There were instances where family members were able to help the participant become more lucid and brought them immense comfort. These findings suggest that family members could be utilized in caring for patients experiencing POD to help improve patient experiences.

Nurses

Postoperative delirium can have a substantial negative impact on the nurses who care for these patients. In the credible qualitative systematic review by Thomas et al. (2021), it was noted that nurses experienced frustration when caring for this patient population due to increased workload from time consuming care (e.g., more frequent monitoring). They explained that this increased workload made it challenging to fulfill their nursing roles. Nurses described spending

substantial amounts of time reorienting patients with POD and trying to safely keep them in bed, that they felt they were neglecting the other patients in their care. Lack of resources (e.g., staffing concerns) and verbal abuse from these patients furthered frustrations. The nurses also noted concern for their safety due to the physical abuse they suffered from confused patients experiencing POD (Thomas et al., 2021). Caring for these patients often led to increased stress felt by the nursing staff. Overall, it was noted that nursing care of patients experiencing POD was both emotionally and physically exhausting.

Healthcare System

There has also been a considerable impact noted on the entire healthcare system due to POD. Increased costs of care associated with POD were noted in the medium-quality cross-sectional study by Guo et al. (2021). One-year follow-up with patients ($n = 122$) who experienced POD showed significantly higher healthcare costs than those unaffected, with an average of $44 291 United States dollars extra per patient ($p < 0.001$). Categories significantly associated with this total included ICU stay ($p < 0.001$), increased length of stay ($p < 0.001$), further hospitalizations ($p < 0.01$), and discharge to a rehabilitative facility ($p = 0.02$). It should be noted that these findings were with elective surgical patients who would typically have been considered good candidates for their surgery. It may be possible that costs would be higher in a cohort of patients requiring urgent or emergency surgery, as they may have more comorbidities and would not necessarily otherwise be cleared for elective surgery.

There was no recent literature noted that outlined the impact of POD on the Canadian healthcare system. While dollar values cannot be compared between the American and Canadian healthcare systems, given the general impact of POD and aging population within Canada there

may likely be a substantial cost associated with the care of these patients. However, without this available data no assumptions can be made.

Contributing Factors

Several contributing factors were noted within the literature to be associated with POD. These included several risk factors, poor postoperative pain control, lack of knowledge (i.e., nurses and families), and lack of prevention, identification, and management strategies in the practice setting.

Risk Factors

Advanced age, preoperative cognitive function, and type of anesthetic were noted to be considerable risk factors for POD in the medium-quality systematic reviews by Silva et al. (2021) and Watt et al. (2018). Among patients undergoing elective surgery (n = 41 quantitative studies), Watt et al. (2018) noted that preoperative cognitive impairment was a significant risk factor for POD (Odds ratio [OR]: 2.7; 95% CI 1.9-3.8). Similarly, Silva et al. (2021) found significant association between preoperative cognitive impairment (i.e., low Mini-Mental State Examination score) and POD amongst patients undergoing non-cardiac surgery (n = 49 quantitative studies). Silva et al. (2021) noted that participants with POD had higher rates of general anesthesia when compared to other forms (i.e., epidural, spinal, or local; p = 0.044). Participants were also noted to be significantly older than those who did not develop POD (74.1 +/- 6.0 years versus 69.5 +/- 6.2 years, p = 0.003).

Postoperative Pain Control

Two medium-quality cross-sectional studies examined the relationship between postoperative pain and POD symptoms in elderly patients (DeCrane et al., 2011; Denny & Lindseth, 2020). DeCrane et al. (2011) noted that in participants undergoing non-cardiac surgery

(n = 176 older adults), those with lower pain levels in the first two postoperative days were more likely to recover from POD by the second day (OR: 2.59; 95% CI 1.15-5.83). In the two days after joint replacement surgery (n = 53 older adults), Denny and Lindseth (2020) noted that higher pain levels were significantly associated with symptoms of POD, after controlling for confounding factors (p = 0.04). These findings highlight the importance of pain control in the postoperative period for elderly adults, as pain may be associated with POD and controlling pain may assist in reducing POD. However, these findings are from cross-sectional studies of weak design and findings from stronger, analytic studies would be needed to draw any concrete conclusions.

Nurses' Lack of Knowledge

While nurses working in acute surgical settings may care for patients with POD, there is a noted knowledge deficit and desire for effective education. In the medium-quality UCBA study by **Meako** et al. (2011), 23 orthopedic nurses were delivered an education intervention regarding POD. Pre-test scores noted that nurses with two to ten years of experience had significantly lower medication knowledge than those with greater than ten years of experience (p = 0.024). Overall, participants were most likely to answer questions about risk factors and medications related to POD incorrectly.

Similarly, both the credible qualitative systematic review by Thomas et al. (2021) and the credible qualitative study by Oberai et al. (2019) noted that nurses interviewed about their experiences caring for patients with POD expressed concern about feeling unprepared to care for this patient population. Oberai et al. (2019) noted that some nurses did not feel confident recognizing POD, especially in patients who displayed hypoactive symptoms (e.g., drowsiness). A distinct deficit in both knowledge and ongoing education were also noted in the studies

analyzed by Thomas et al (2021). Many nurses were uncertain about how to provide proper care to these patients and formal education was often absent (Thomas et al., 2021). It was also noted that junior and senior nurses expressed learning about POD through observation of other nurses, rather than through formal education. This is a concern, as there may be incorrect techniques or habits shared amongst staff rather than evidence-informed care.

Patients' experiences have also highlighted a lack of knowledge and apathetic attitudes from nursing staff in the qualitative studies by Lingehall et al. (2015) and Pollard et al. (2015). Interviews with participants revealed that they felt dismissed by nursing staff, with some making light of their experience. Participants also explained that they did not receive a proper explanation about their POD from nursing staff (Lingehall et al., 2015). This is concerning, as patient and family education is an expectation of quality nursing care and may suggest that a lack of nursing knowledge about POD is related to this issue.

Family Members' Lack of Knowledge

Findings from the credible qualitative studies by Oberai et al. (2019) and Sturm et al. (2019) suggested that patients' families are often not well educated about POD but are an underutilized source of support that should be cultivated. The nurses interviewed by Oberai et al. (2019; n = 14) and Sturm et al. (2019; n = 29) were noted to have experience working in acute surgical settings with patients suffering from POD. The nurses from both qualitative studies suggested that there was lack of knowledge for both patients and their families about POD and that educating family members before symptoms of POD begin would be most effective (Oberai et al., 2019; Sturm et al., 2019). The participants in the study by Sturm et al. (2019) also suggested that it would be beneficial for nurses to deliver this necessary education. In the credible qualitative systematic review by Thomas et al. (2021), the nurses noted that family

members can enhance patient safety by visiting with them and utilizing orientation techniques. This can also help to reduce the overall demand for the unit. In addition, family members are most familiar with a patient's baseline cognition. They can be a vital resource in recognizing changes related to POD, specifically those that are more subtle (Oberai et al., 2019).

Lack of Prevention, Identification, and Management

While POD can often be prevented, there is a noted lack of established preventative nursing care observed within the literature. Early identification using valid diagnostic tools and effective management is essential for recovery, though these interventions are often underutilized in the clinical setting. The nurses in the qualitative studies by Oberai et al. (2019) and Sturm et al. (2019) noted that there were no prevention protocols or management pathways for them to follow in their practice. They felt it was left to the nurses to manage POD, which often led to increased workload. The nurses in the study by Sturm et al. (2019) also stated that patient care was sometimes mismanaged with the use of restraints or sedation. This would lead to further confusion and agitation, thus negatively impacting recovery of POD.

It was noted in the qualitative systematic review by Thomas et al. (2021) and the qualitative study by Oberai et al. (2019) that nurses felt POD was challenging to identify, particularly if the patient also had dementia or was exhibiting hypoactive symptoms (e.g., drowsiness). Cognitive changes associated with POD (e.g., agitation) can be similar to the presentation of dementia, thus making it more challenging to identify acute changes in these patients. As well, hypoactive delirium (e.g., lethargy) may be dismissed or unidentified as these symptoms are vaguer than those of hyperactive delirium (e.g., aggression). While they dealt with POD often in their practice, many nurses expressed that it was either under recognized or not taken seriously by physicians (Oberai et al., 2019; Sturm et al., 2019). Screening and diagnostic

tools were deemed necessary for a proper assessment, though nurses expressed that performing these assessments felt like unnecessary paperwork added to their already demanding documentation. This would suggest that further education about the importance of early identification of POD may be needed.

Summary

Based on current findings from the literature, it has been noted that POD is a substantial issue. This is due to high incidence (i.e., 30.7% among non-cardiac surgeries; Silva et al., 2021) and prevalence rates (i.e., up to 32%; Koirala et al., 2020) among elderly individuals after surgical intervention. Compounded with this issue is the rapidly aging population within Canada, and specifically in Newfoundland and Labrador (Government of Canada, 2021). Postoperative delirium negatively impacts the lives of patients and families, as well as places strain on nurses and the healthcare system. Further contributing to the issue of POD is the lack of knowledge (i.e., nurses and families) and prevention, identification, and management strategies for confronting this condition. Based on this information, a resource is needed to address this issue in the clinical setting to improve both patient outcomes and workplace conditions.

Interventions

As previously noted, a total of 15 articles were selected to inform the literature review regarding interventions related to POD. These included three medium-quality systematic reviews (Sockalingham et al., 2014; van Valthhuijsen et al., 2016; Yanamadala et al., 2013) and 12 quantitative studies. The quantitative studies were predominantly of strong design, including one high-quality randomized controlled trial (RCT; **Chen** et al., 2017), four medium-quality RCTs (Chevillon et al., 2015; **Guo** et al., 2016; Wang et al., 2020; Xue et al., 2020), one medium-quality non-randomized controlled trial (NRCT; **Guo & Fan**, 2016), and two medium-quality

controlled before-after studies (CBA; **Kratz** et al., 2015; **Zhang** et al., 2017). There were also three medium-quality cohort studies of moderate design (Brooks et al., 2014; **Choi** et al., 2019; Todd et al., 2015) and one medium-quality UCBA study of weak design (Bull et al., 2016). In cases where there was limited literature regarding POD, medium- or high-quality systematic reviews were considered if they addressed the issue of delirium and included any studies with acute surgical settings. Each of the studies were analyzed using the PHAC (2014) tool kit and the strength of the evidence was noted to vary between each category of intervention studies.

Educational Interventions

Lack of knowledge amongst nurses and patient's families was noted to be a contributing factor to POD within the literature (**Meako** et al., 2011; Oberai et al., 2019; Sturm et al., 2019; Thomas et al., 2021). For nursing, this concern was regarding a knowledge deficit on risk factors, identification, and evidence-based nursing interventions compounded by a lack of proper tools and protocols (Meako et al., 2011; Oberai et al., 2019; Sturm et al., 2019; Thomas et al., 2021). Families were identified by nurses as valuable resources for effective POD care, though it was suggested that they required further education (Oberai et al., 2019; Sturm et al., 2019; Thomas et al., 2021). Several recent systematic reviews (Sockalingham et al., 2014; Yanamadala et al., 2013) and intervention studies (Bull et al., 2016; Chevillon et al., 2015; **Choi** et al., 2019; **Guo & Fan**, 2016; Wang et al., 2020; Xue et al., 2020) were noted in which researchers sought to educate nurses, families, and patients about POD. Varying levels of improvement in knowledge scores and POD rates were noted.

Education for Nursing Staff

Delirium. There were no systematic reviews noted that examined intervention studies specifically related to POD, though there were two medium-quality systematic reviews noted

that assessed intervention studies related to general delirium (Sockalingham et al., 2014; Yanamadala et al, 2013). Sockalingham et al. (2014) and Yanamadala et al. (2013) both presented medium-quality systematic reviews that analyzed studies with educational interventions related to interprofessional collaboration and delirium identification, respectively. Both systematic reviews analyzed quantitative studies from a variety of practice settings including medical units, surgical units, rehabilitative units, palliative care units, and emergency departments. While delirium was the focus of these reviews, several studies included in the reviews were focused specifically on POD.

Sockalingham et al. (2014) examined ten quantitative studies which focused on delirium education for interdisciplinary groups, with varying study designs and outcomes (e.g., improved knowledge scores). Similarly, Yanamadala et al. (2013) analyzed 26 quantitative studies that implemented educational interventions with healthcare professionals that focused on identifying delirium. Both medium-quality systematic reviews included studies with participants belonging to interdisciplinary teams, including nurses, physicians, physiotherapists, pharmacists, and dieticians (Sockalingham et al., 2014; Yanamadala et al., 2013). Yanamadala et al. (2013) also included several studies in which the participants were solely nurses, rather than various members of an interdisciplinary team.

The researchers outlined similar education strategies amongst the studies in each medium-quality systematic review (Sockalingham et al., 2014; Yanamadala et al., 2013). Yanamadala et al. (2013) noted that in-person lectures, self-learning modules, workshops, and group discussions were some of the effective educational delivery methods noted in the studies. Similarly, Sockalingham et al. (2014) noted that all ten studies in their medium-quality

systematic review utilized a lecture approach either as the sole strategy or in combination with self-learning modules, workshops, or group sessions.

As the study designs and outcomes varied, the researchers were unable to conduct meta-analyses of the findings (Sockalingham et al., 2014; Yanamadala et al., 2013). Therefore, they were unable determine which specific educational strategies were most effective, due to heterogeneity of the studies. Sockalingham et al. (2014) noted that outcomes of the studies they examined included greater learner satisfaction (n = 2), improved knowledge scores (n = 2), enhanced team performance (n = 2), documentation improvements (n = 2), organizational improvements (n = 1), and reduction in delirium rates (n = 5). Yanamadala et al. (2013) noted that studies (n = 5) which combined predisposing (i.e., distribution of information), enabling (i.e., provision of resources), and reinforcing (i.e., feedback from peers and experts) factors in their educational strategies achieved more significant results with either staff performance, knowledge scores, or identification of delirium. For example, a study in which nurses attended a one-hour in-person lecture (i.e., predisposing), were provided written guidelines (i.e., enabling), and then later attended a follow-up group discussion (reinforcing) would be likely to be effective in improving delirium identification than a study in which only one or two of those strategies were utilized.

Both studies were medium-quality systematic reviews of strong design (Sockalingham et al., 2014; Yanamadala et al., 2013). Concerns with these systematic reviews were mostly related to the lack of meta-analysis of the data, which was related to the heterogeneity of the findings. It was noted that high-quality studies of strong design (e.g., RCTs) were lacking and would be required for a conclusive statement from either systematic review (Sockalingham et al., 2014; Yanamadala et al., 2013). However, there is still strong evidence that interprofessional delirium

education delivered as in-person lectures, self-learning modules, workshops, or group discussions can result in improved team behaviours (e.g., improved documentation) and positive patient outcomes (e.g., reduced rates of delirium; Sockalingham et al., 2014). As well, the use of one or more predisposing educational strategies (e.g., self-learning modules) combined with enabling (e.g., handouts) and reinforcing factors (e.g., feedback from post-tests) can help to improve delirium recognition. These findings will be used to inform the development of the educational resource, as these delivery methods and strategies may help to improve outcomes for patients.

Postoperative Delirium. Since the completion of the systematic reviews by Sockalingham et al. (2014) and Yanamadala et al. (2013), there were two studies noted that implemented educational interventions for nursing staff regarding POD. These included one medium-quality CBA study (**Guo & Fan**, 2016) and one medium-quality cohort study (**Choi** et al., 2019), which reported outcomes of significantly reduced POD rates. Choi et al. (2019) also reported significantly improved knowledge scores. These studies have built on previous knowledge of delirium education (Sockalingham et al., 2014; Yanamadala et al., 2013) and noted evidence supporting the use of similar educational interventions for teaching about POD.

Both studies provided educational interventions for nurses prior to the initiation of a POD prevention protocol, which was the primary focus of the study (Choi et al., 2019; Guo & Fan, 2016). Choi et al. (2019) also included physicians within their educational session. The educational interventions were conducted in-person, with Choi et al. (2019) delivering one 30-minute session and Guo and Fan (2016) providing several lectures of an unspecified length of time. Guo and Fan (2016) and Choi et al. (2019) covered similar topics within these educational sessions, including clinical presentation, risk factors, early identification, and prevention

techniques. Guo and Fan (2016) conducted a medium-quality CBA study of strong design, whereas and Choi et al. (2019) presented a medium-quality cohort study of moderate design. In terms of the educational interventions, concerns with these studies were related to the limited information regarding data collection and analysis to assess the effectiveness of the interventions. This was likely because the educational interventions were secondary to the main purpose of both studies (i.e., prevention protocols).

The outcomes of the studies varied, as only the medium-quality cohort study by Choi et al. (2019) reported pretest and post-test scores for their educational intervention. It was noted that knowledge scores amongst the staff significantly increased from 40.52 pre-intervention to 43.24 post-intervention ($p < 0.001$). Guo and Fan (2016) did not note any knowledge scores within their study. However, both studies did report on the presence of POD once their prevention protocols were delivered by the previously educated staff members. Guo and Fan (2016) noted significantly fewer severely delirious participants at all time points in the intervention group when compared to the control group ($p < 0.01$). Similarly, Choi et al. (2019) reported significantly fewer participants with POD in their intervention group (6.2%; $n = 17$) compared to their control group (10.2%; $n = 28$; $p = 0.015$).

While the same nurses and physicians who received the educational interventions provided the POD prevention protocols, it is unclear if the reduction in POD rates can be attributed to improved knowledge from the education sessions, the delivery of the prevention protocol, or both. Overall, the findings from Choi et al. (2019) and Guo and Fan (2016) are consistent with what was noted in the medium-quality systematic reviews (Sockalingham et al., 2014; Yanamadala et al., 2013) on delirium education. This further adds to the strength of the

evidence that delirium and POD educational interventions may improve both nurses' knowledge scores and patient outcomes (i.e., reduced rates of POD).

Education for Families

Two family education interventions delivered by nurses were noted in the literature that significantly reduced rates of POD or improved POD knowledge scores, including the medium-quality RCT by Wang et al. (2020) and the medium-quality UCBA study by Bull et al., (2016), respectively. Wang et al. (2020) conducted their study in China with 281 participants undergoing either general or thoracic surgery and their families. In the study by Bull et al. (2016), 34 older adult-caregiver dyads were assessed in which the older adults underwent orthopedic surgery in the United States. In both studies, participants undergoing surgery were age 70 or older. Wang et al. (2020) utilized an intervention group of 152 participants along with a control group of 129 participants who received usual care that was delivered within the facility prior to the implementation of the intervention. Contrastingly, Bull et al. (2016) delivered their intervention to all 34 older adult-caregiver dyads without the use of a control group.

Both studies had nurses deliver their educational material to participants and family members but utilized different delivery methods for this information. In the medium-quality RCT by Wang et al. (2020), educational material was delivered in-person regarding three protocols that families were to administer to the participants who underwent surgery. These protocols consisted of orientation techniques, early mobilization, and therapeutic activities tailored for each participant. Nurses then supervised the delivery of this education by the family members. In contrast, Bull et al. (2016) delivered their educational material over the phone to the family members in their medium-quality UCBA study. This education focused on early identification, as family members were taught how to recognize changes in behaviour related to

POD symptoms and how to act on these findings. Nurses delivered a total of four telephone-based modules over three weeks prior to surgery.

Outcomes from these studies varied, as Wang et al. (2020) reported presence of POD and Bull et al. (2016) focused on changes in POD knowledge scores. Both studies were noted to have found significant results and utilized the CAM or a variation of the CAM for their assessments. Wang et al. (2020) utilized the CAM to assess for the presence of POD in their participants and noted that the intervention group ($n = 152$) experienced significantly lower rates of POD compared to the control group ($n = 129$) within the first seven postoperative days ($p < 0.001$). Bull et al. (2016) utilized a variation of the CAM designed for family members, titled FAM-CAM. They also reported significant results, as the caregivers' POD knowledge score from before the intervention (11.4 +/- 3.6, 2-18) improved two weeks after (13.9 +/- 2.0, 10-18) and two months after (14.0 +/- 2.2, 9-18) the intervention ($p < 0.001$). These findings show that the family members were able to retain the knowledge for up to two months after the educational intervention. Bull et al. (2016) also reported that there was a 94% agreement rate between the caregivers' identification of POD and that of the trained researcher, suggesting that family caregivers may be able to be trained to identify POD in their loved ones.

The medium-quality RCT by Wang et al. (2020) was noted to be of strong design, while the medium-quality UCBA study by Bull et al. (2016) was of weak design. One concern with both studies was that most participants undergoing surgery were males and family caregivers were females. This limited generalizability of findings and further studies would benefit from more diverse samples. As there were differing strengths in the study designs and outcomes from both Wang et al. (2020) and Bull et al. (2016), no conclusive statements can be made about the strength of the evidence. Further medium and high-quality studies of strong design would be

needed to draw any concrete conclusions. However, these findings do suggest that nurses should be aware that educating families and caregivers about POD may be beneficial in both identifying POD through caregiver assessment and in reducing rates of POD. For these reasons, nurses should encourage family and caregiver involvement in care and provide education regarding POD.

Education for Patients

Two medium-quality RCTs (Chevillon et al., 2015; Xue et al., 2020) delivered nurse-led preoperative education to patients to assess for differences in mechanical ventilation times, length of ICU stays, and presence of POD with varying results noted. Chevillon et al. (2015) studied 129 participants in the United States who underwent pulmonary thromboendarterectomy (i.e., surgical removal of blood clots from pulmonary arteries). Xue et al. (2020) assessed 133 participants who had cardiac surgery in China. Participants in both Chevillon et al. (2015) and Xue et al. (2020) were adults over the age of 18. In both studies, nurses delivered educational material to the intervention groups, while control groups received usual care which was unstructured education from various interdisciplinary team members (e.g., surgeons). Chevillon et al. (2015) noted 63 participants in their intervention group and 66 in the control. A total of 67 participants received the intervention in the study by Xue et al. (2020), while 66 served as a control group.

The educational interventions in both studies were delivered by ICU nurses who provided the interventions groups with handouts, visualization of medical equipment, and a tour of each respective ICU (Chevillon et al., 2015; Xue et al., 2020). Chevillon et al. (2015) noted that their education intervention was individualized, written at a fifth-grade reading level, and lasted 45 minutes. Xue et al. (2020) also individualized their education intervention which was done based

on gender, age, type of surgery, and education level. There was no mention of the length of time it took to complete this education.

The primary outcome for each of the studies was the presence of POD, with varying results noted (Chevillon et al., 2015; Xue et al., 2020). Presence of POD was measured with the CAM-ICU in both studies and reported either as rates of POD or days experiencing POD, respectively (Xue et al., 2020; Chevillon et al., 2015). Xue et al. (2020) reported that 10.4% of their intervention group (10.4%) developed POD compared to 24.2% of their control group (n = 16) which was statistically significant (p = 0.038). Conversely, Chevillon did not find a significant difference between both groups in which the intervention group had a mean POD rate of 0.4 days (+/- 1.1) and the control group experienced 0.7 days (+/- 1.4) on average (p = .16). It should be noted that in the medium-quality study by Xue et al., (2020), the presence of POD was measured exclusively by trained researchers, whereas in the medium-quality study by Chevillon et al. (2015) many different bedside nurses assessed for POD. As a result, the interpretations of POD may have varied and affected the results of the study. While the CAM-ICU is a validated tool, there was no mention of whether the nurses received education on how to properly use the screening tool.

Secondary outcomes for both studies included total mechanical ventilation time and length of ICU stay (Chevillon et al., 2015; Xue et al., 2020). When comparing their intervention group to the control group, Xue et al. (2020) reported significantly shorter mechanical ventilation time (13.7 +/- 7.6 versus 18.6 +/- 9.8, p = 0.002) and shorter ICU stay (31.3 +/- 9.1 versus 36.5 +/- 10.4, p = 0.003), with both measured in hours. Similarly, Chevillon et al. (2015) noted significantly shorter days of mechanical ventilations time in their intervention group in comparison to their control group (2.0 +/- 2.3 versus 1.6 +/- 1.7, p = 0.04). In contrast, Chevillon

et al. (2015) did not find significant differences between their intervention and control groups in terms of ICU stay, which was measured in days (4.2 +/- 2.9 versus 5.9 +/- 9.2, p = 0.17).

Both studies were RCTs noted to be of strong design and medium quality (Chevillon et al., 2015; Xue et al., 2015). Concerns related to possible confounding resulted in the medium quality assessments. In both studies, educational interventions were delivered by groups of trained nurses rather than one individual nurse, meaning that there may have been differences in the education received by the participants. This may have impacted study outcomes. Chevillon et al. (2015) also noted that the participants in the intervention group had significantly greater support systems at baseline than those in the control group. This may have created bias within the study. There were varying outcomes noted between both studies, with only Xue et al. (2020) reporting statistical significance between intervention and control groups for the primary outcome of POD presence and secondary outcome of length of ICU stay. However, both studies noted significantly lower mechanical ventilation times in their respective intervention groups when compared to the control groups. As there were limited recent studies analyzing the impact of nurse-led educational interventions for patients and there were conflicting results in the findings, there is only weak evidence to suggest that patient outcomes associated with POD can be improved with these strategies. Further medium and high-quality studies of strong design would be needed to make any conclusions about the evidence. However, nurses should be aware that there is potential that providing education about POD and postoperative experiences in the preoperative period may help to improve patient outcomes related to POD.

Early Identification of Postoperative Delirium

It has been suggested in the literature that POD is often under recognized by healthcare professionals, which negatively impacts the management of this condition. With proper use of

validated tools, nurses should be able to quickly detect POD. However, they must first comprehend how to utilize these screening tools. While there are several validated screening tools for identifying POD in practice, the Confusion Assessment Method (CAM) and CAM-ICU were noted to be the most common tools in this literature search. The CAM has been previously validated for use in practice and research (Inouye et al., 1990).

Screening Tools

The medium-quality systematic review conducted by van Velthuijsen et al. (2016) analyzed 37 quantitative studies to determine feasibility, validity, and reliability of delirium assessment tools used for hospitalized patients aged 65 and older. Studies included in the review were derived from several practice settings, including surgical units, medical units, ICUs, and emergency departments. While over 23 tools were identified, the CAM was noted to be one of the best as it had high sensitivity (i.e., ranging 46% to 94%) and specificity (i.e., ranging 63% to 100%). However, there was some concern that the tool may not be feasible for nurses as it can be time consuming with both observational and interactive components. The Nurse Delirium Screening Scale (Nu-DESC) was determined to be more feasible for nursing practice as it is less time consuming, as well as valid and reliable (van Velthuijsen et al., 2016). This screening tool was noted to have high sensitivity (i.e., ranging 32% to 96%) and specificity (i.e., ranging 69% to 92%), but was utilized less often in the literature.

Compliance with Screening Tools

Two medium-quality cohort studies (Brooks et al., 2014; Todd et al., 2015) implemented the CAM or CAM-ICU to evaluate nursing staff compliance with screening tools used to assess POD. Brooks et al. (2014) compared the Mini-Cog assessment tool preoperatively with the CAM or CAM-ICU postoperatively among 96 participants who underwent elective general surgery

against a pre-intervention cohort (n = 106). Similarly, Todd et al. (2015) implemented the CAM after surgical fixation for hip fracture with 33 participants in the intervention group and 23 in the pre-intervention cohort. Participants in both studies were adults aged 65 or older (Brooks et al., 2014; Todd et al., 2015).

The primary outcome for each study was compliance rates for the respective screening tools. Brooks et al. (2014) noted that the CAM and CAM-ICU screening tools had a higher rate of compliance among nursing staff than the Mini-Cog (91% versus 79%). Similarly, Todd et al. (2015) reported a high compliance rate of 86.7% with the CAM among their nursing staff. Feasibility is crucial, as higher compliance rates with a valid and reliable screening tool can serve to improve identification of POD.

Both studies were noted to be of medium-quality and moderate design (Brooks et al., 2014; Todd et al., 2015). Concerns with the studies were related to the lack of controlled design, as well as the small sample size in the study by Todd et al. (2015). There is moderate evidence to suggest that the CAM and CAM-ICU may indeed be feasible for nursing practice as the findings from the studies were consistent. Further medium or high-quality studies of strong design would serve to strengthen the quality of this evidence. The findings from these studies are important, as they suggest that nurses may be able to effectively identify POD with valid and reliable screening tools that are feasible for the practice setting. This would then allow for timely treatment for identified cases of POD.

Prevention and Management Interventions

Six quantitative studies were conducted which produced strong evidence that the use of prevention protocols can effectively reduce rates of POD (**Chen** et al., 2017; **Choi** et al., 2019; **Guo** et al., 2016; **Guo & Fan**, 2016; **Kratz** et al., 2015; **Zhang** et al., 2017). These studies

included one high-quality RCT (Chen et al., 2017), one medium-quality RCT (Guo et al., 2106), one medium-quality NRCT (Guo & Fan, 2016), two medium quality CBA studies (Kratz et al., 2015; Zhang et al., 2017), and one medium-quality cohort study (Choi et al., 2019). The studies were primarily of strong design, except for the medium-quality cohort study which is of moderate design (Choi et al., 2019). In each of the studies, the prevention protocols were implemented after surgical intervention and were continued for the duration of the study. Therefore, the protocols were continued during management of POD for participants who were diagnosed during the study period. Of these studies, four protocols were delivered by nurses (Chen et al., 2017; Guo & Fan, 2016; Kratz et al., 2015; Zhang et al., 2017) and two were provided by interdisciplinary teams (Choi et al., 2019; Guo et al., 2016).

Nursing Protocols

Four prevention protocols were delivered by nurses working in acute surgical settings and were noted to significantly reduce rates of POD, including one high-quality RCT (Chen et al., 2017), one medium-quality NRCT (Guo & Fan, 2016), and two medium-quality CBA studies (Kratz et al., 2015; Zhang et al., 2017). Two of these studies were conducted in China and studied participants after cardiac or abdominal surgery (n = 122; Guo & Fan, 2016) or coronary artery bypass grafting surgery (n = 278; Zhang et al., 2017), respectively. Similarly, the study by Chen et al. (2017) assessed 377 participants after abdominal surgery in Taiwan. The fourth study was conducted in Germany and assessed 114 participants who underwent general surgery (Kratz et al., 2015). All participants were adults, though Chen et al. (2017) included only those aged 65 or older and Kratz et al. (2015) included only those over age 70. In each of the studies there was an intervention group which received the nurse-led prevention protocol, and a control group that

received usual care from hospital staff. Usual care was consistent with what was present within the facility prior to the implementation of the intervention.

The prevention protocols varied amongst studies, though each protocol consisted of several nursing interventions. Of these interventions, sleep promotion was noted in three study protocols and was achieved by either providing relaxation techniques, following the participants personal sleep habits, or administering medication as needed, respectively (Guo & Fan, 2016; Kratz et al., 2015; Zhang et al., 2017). The use of orientation techniques was noted within the protocols of three studies (Chen et al., 2017; Kratz et al., 2015; Zhang et al., 2017). Several other nursing interventions, including early mobility (Chen et al., 2017; Kratz et al., 2015), nutritional assistance (Chen et al., 2017; Kratz et al., 2015), and encouragement of family visitation (Guo & Fan, 2016; Zhang et al., 2017) were also noted amongst the intervention protocols.

The primary outcome for each of the studies was the presence of POD and each study found significant results. Presence of POD was reported as POD rates in three of the studies that utilized the CAM or CAM-ICU to assess for POD (Chen et al, 2017; Kratz et al., 2015; Zhang et al., 2017). Chen et al. (2017) noted 6.6% of the intervention group developed POD, compared to 15.1% in the control group ($p = 0.008$). The researchers also reported a reduction of POD of 56% with the use of their intervention protocol. Kratz et al. (2015) noted significantly lower rates of POD in their intervention group ($n = 4.9\%$) when compared to their control group ($n = 20.8\%$; $p= 0.01$). Similarly, 13.48% of the participants in the intervention group developed POD compared to 29.93% of the control group, in the study by Zhang et al. (2017; $p = 0.001$). In contrast, Guo and Fan (2016) analyzed the presence of delirium as mean delirium scores in their intervention and control groups using the delirium detection score (DDS) scale. When compared

to their control group, the intervention group had significantly lower mean delirium scores in change over time ($p < 0.01$).

Each of these studies were determined to be of strong design. The study by Chen et al. (2017) was deemed high-quality, while the remaining three studies were considered medium-quality (Guo & Fan, 2016; Kratz et al., 2015; Zhang et al., 2017). Concerns with the medium-quality studies were related to insufficient control of confounding. Each of these studies showed significantly lower rates of POD in the participants who received a nurse-led prevention protocol when compared to control groups who received usual care (Chen et al., 2017; Guo & Fan, 2016; Kratz et al., 2015; Zhang et al., 2017). The studies were all of strong design and deemed either medium or high-quality. These findings indicate that there is strong evidence to suggest that nurse-led prevention protocols consisting of nursing interventions are effective in reducing rates of POD in acute surgical settings. This emphasized the importance of implementing similar nursing prevention protocols within practice. As well, interventions were nonpharmacologic and separate of other disciplines. Therefore, these are strategies that nurses can independently utilize in the surgical setting to improve patient outcomes if no protocol is available.

Interdisciplinary Protocols

Two prevention protocols were delivered by interdisciplinary teams in acute surgical settings and were noted to significantly reduce rates of POD, including the medium-quality RCT by Guo et al. (2016) and the medium quality cohort study by Choi et al. (2019). Guo et al. (2016) conducted their study in China with 160 participants after oral tumour resection surgery, whereas Choi et al. (2019) examined 549 participants who underwent orthopedic surgery in Korea. Participants in both studies were adults aged 65 or older, while Guo et al. (2016) also excluded any adults over the age of 80. In each study, there was a control group or cohort who received

usual care and an intervention group who received an interdisciplinary prevention protocol. Usual care was the standard care provided to patients at the facility prior to the implementation of each intervention protocol.

In the medium-quality cohort study by Choi et al. (2019), the researchers first developed and implemented a screening tool to detect participants that were at higher risk for developing POD. Participants then received the interdisciplinary prevention protocol provided by nurses, pharmacists, and geriatricians. Guo et al. (2016) also utilized an interdisciplinary approach that included nurses, physicians, pharmacists, physiotherapists, and dieticians. The prevention protocols of both studies varied but were noted to have some similar features (Choi et al., 2019; Guo et al., 2016). Sleep promotion, orientation techniques, and sensory assistance (e.g., use of hearing aids) were strategies noted within the prevention protocols of both studies (Choi et al., 2019; Guo et al., 2016). Choi et al. (2019) also noted elimination management, pain control, and medication assessment as interventions within their prevention protocol.

Outcomes from the studies by Guo et al. (2016) and Choi et al. (2019) included the presence of POD, with both studies finding significant results. Guo et al. (2016) utilized both the Richmond Agitation Sedation Scale (RASS) and the CAM-ICU to assess for the presence of POD. The researchers reported that 15% (n = 10) of their intervention group developed POD within the first three postoperative days, compared to 31.25% (n = 25) in the control group (p = 0.006). In contrast, Choi et al. (2019) did not note the use of a validated tool and reported that presence of delirium was based on physician assessment. This was a point of concern, as the diagnosis was less objective and risked misclassification bias. Choi et al. (2019) also noted significant results, as 6.2% (n = 17) of participants in the intervention group developed POD compared to 10.2% (n = 28) in the control group (OR= 0.316, 95% CI: 0.125-0.800, p = 0.015).

The researchers also analyzed the performance of their screening tool in predicting POD based on the participants' risk level, which showed a sensitivity of 94.1% and specificity of 72.7%.

The medium-quality RCT by Guo et al. (2016) was noted to be of strong design, while the medium-quality cohort study by Choi et al. (2019) was of moderate design. The study by Guo et al. (2016) was noted as medium-quality due to a risk of contamination, as the physicians in the surgical ICU cared for participants in both the intervention and control group. However, significant results were still noted suggesting that this may have had little impact on the outcome of the study. Choi et al. (2019) noted that their participants were diagnosed as having POD based on physician diagnosis rather than a validated tool, which contributed to the medium-quality rating. The findings from these studies suggest that there is strong evidence that interdisciplinary prevention protocols are effective in reducing rates of POD in the acute surgical setting. This highlighted the importance of collaboration between disciplines and the role of nursing within the care team in providing preventative care for this patient population.

Summary of the Literature

The literature review revealed a considerable amount of nursing and allied health literature regarding the education of POD and interventions aimed at the prevention, identification, and management of this condition. These studies were primarily strong in design, including systematic reviews, RCTs, NRCTs, and CBA studies. However, most of the studies were of medium quality with issues related to potential confounding factors.

It was identified based on nurses' opinions, attitudes, interactions with patients, and pre-existing knowledge (i.e., pre-test scores) that there was a knowledge gap regarding POD and how to effectively care for this patient population (Lingehall et al., 2015; **Meako** et al., 2011; Oberai et al., 2019; Pollard et al., 2015; Sturm et al., 2019; Thomas et al., 2021). Based on the

findings of the medium-quality systematic review by Sockalingham et al. (2014), the medium quality CBA study by **Guo and Fan** (2016), and the medium-quality cohort study by **Choi** et al. (2019), there is strong evidence to suggest that in-person lectures may be effective at improving nurses' knowledge scores and patient outcomes (i.e., reduction of POD). Several other delivery methods (i.e., self-learning modules, workshops, and group discussions) were also noted to be effective in both the medium-quality systematic reviews (Sockalingham et al., 2014; Yanamadala et al., 2013). It was also reported by Yanamadala et al. (2013) that educational strategies featuring predisposing (e.g., self-learning modules) factors combined with enabling (e.g., handouts) and reinforcing factors (e.g., feedback from post-tests) can help to improve identification of delirium. Overall, there is enough strong evidence to suggest that this educational resource for nurses should include predisposing, enabling, and reinforcing factors, and be delivered via in-person lecture, self-learning module, workshop or group discussion.

The importance of family support when caring for patients with POD was identified in the several studies (Lingehall et al., 2015; Pollard et al., 2015; Thomas et al, 2021). There was some evidence to suggest that education for families may help to improve knowledge scores or reduce rates of POD (Bull et al., 2016; Wang et al., 2020). The medium-quality RCT by Wang et al. (2020) and the medium-quality UCBA study by Bull et al. (2016) showed significant improvements in POD rates and knowledge scores, respectively. While further medium or high-quality studies of strong design are needed, these findings indicate that nurses should be aware of the importance of educating families. Proper education regarding POD may help with early detection and reduction of POD rates. From these findings, there was enough evidence to promote the delivery of POD education to patients' families within the educational resource.

The need for effective delirium screening tools was noted in the literature, as nurses felt POD was challenging to identify and did not always comprehend the importance of these screening tools (Oberai et al., 2019; Sturm et al., 2019; Thomas et al., 2021). The medium-quality systematic review by van Velthuijsen et al. (2016) provided strong evidence that the CAM and Nu-DESC tools were both valid and reliable. While the CAM was the most utilized tool, it was suggested that it may lack feasibility as it can be time consuming. However, there was also conflicting evidence from the medium-quality cohort studies by Brooks et al. (2014) and Todd et al. (2015) that suggested the CAM and CAM-ICU may indeed be feasible due to their high compliance rates among nursing staff (i.e., 91% and 86.7%, respectively). While the CAM is a validated, reliable, and commonly used tool, the evidence to support its feasibility in practice is only moderate. Despite these concerns, it is crucial for nurses to understand and utilize valid and reliable screening tools within practice as this would likely improve the identification of POD and allow for proper management of this condition. These findings are essential for the development of this learning resource, as it will include education regarding the use of validated screening tools to promote early identification of POD.

Credible qualitative findings from the literature review suggested that nurses often do not have access to prevention protocols or education regarding nursing interventions aimed at POD prevention (Oberai et al., 2019; Sturm et al., 2019). The studies that implemented prevention and management interventions were mainly of strong design and all found significant results in terms of reduction of POD rates within their intervention groups (Choi et al., 2019; **Chen** et al., 2017; **Guo** et al., 2016; Guo & Fan, 2016; **Kratz** et al., 2015; **Zhang** et al., 2017). The strategies utilized in these protocols were mainly non-pharmacologic nursing interventions, such as sleep promotion, sensory assistance, supporting family visitation, reorientation techniques, and early

mobilization (Choi et al., 2019; Chen et al., 2017; Guo et al., 2016; Guo & Fan, 2016; Kratz et al., 2015; Zhang et al., 2017). From these findings, there is strong evidence that nurse-led or interdisciplinary prevention interventions are effective in preventing POD. These studies highlighted the importance of utilizing similar prevention protocols within nursing practice. As the focus of this resource is educational, it is not feasible to also propose a policy change at this time. However, these findings are still essential for the development of the educational resource, as nurses must first understand the rationale behind these nursing interventions and how they can be implemented into practice. Considering many of these interventions were non-pharmacologic nursing interventions independent of other disciplines (e.g., medicine), it is reasonable to both provide this education and promote the use of such interventions within practice, despite the lack of a formal prevention protocol.

The literature reviewed in this paper served to answer the research question and will help to inform the development of the learning resource. The resource will be delivered by either in-person lecture or self-learning module, as these methods are feasible and were determined to be effective for delirium education (Sockalingham et al., 2014; Yanamadala et al., 2013). Through consultations with key stakeholders, the preferred delivery method will be chosen. Educational strategies will also include predisposing (e.g., self-learning module), enabling (e.g., handouts), and reinforcing factors (e.g., feedback from post-tests) based on data gathered from these consultations. Within the resource, nurses will be taught how to properly educate families about POD and how to encourage their involvement in patient care (Bull et al., 2016; Wang et al., 2020). Another important topic will be the early identification of POD through the use of validated screening tools, such as the CAM (Brooks et al., 2014; Todd et al., 2015; van Velthuijsen et al., 2016). Finally, there will be extensive education regarding nursing prevention

interventions (e.g., sleep promotion) that can be utilized within the acute surgical setting (Choi et al., 2019; Chen et al., 2017; Guo et al., 2016; Guo & Fan, 2016; Kratz et al., 2015; Zhang et al., 2017). This is essential, as the use of the prevention strategies outlined in these studies can improve patient outcomes. Overall, the findings from the literature review support the need for this educational resource for surgical nurses to help improve POD knowledge and promote the use of effective prevention, identification, and management interventions that may reduce rates of POD.

Theoretical Framework

The development of the learning resource will be influenced by Knowles' (1984) Adult Learning Theory. The theory is based on the concept of andragogy which suggests that adults learn vastly differently than children and must be actively involved in the learning process (Knowles, 1989). The adult learner should set their own learning goals as adults are motivated by real-life problems and perceive that they are responsible for their own lives. Learning is then meaningful when they can draw on personal experiences to apply their new knowledge and solve problems (Candela, 2020). It has been suggested that adults want to learn information that they deem valuable and that meaningful learning activities (e.g., case studies) are helpful in delivering information (Candela, 2020; Knowles, 1989). While adults may have preferences in personal learning style, they are often self-directed in their learning.

In keeping with the principles of Adult Learning Theory (Knowles, 1984), the development of the learning resource will be guided by the learning needs and goals of the key stakeholders. Learning goals will likely vary between staff, and the resource will need to accommodate both beginner and expert nurses' needs. Preferred delivery methods and teaching strategies for the resource will be discussed in consultation with the staff. Based on the available

literature, it was noted that most educational interventions were delivered as either in-person lectures, self-learning modules, workshops, or group discussions, with significant improvement in knowledge scores or reduction of POD (**Choi** et al., 2019; **Guo & Fan**, 2016; Sockalingham et al., 2014, Yanamadala et al., 2013). It was also suggested in the medium-quality systematic review by Yanamadala et al., 2013 that educational interventions with predisposing (e.g., self-learning module), enabling (e.g., handouts), and reinforcing (e.g., feedback on post-tests) factors were most effective in improving delirium identification. With the ongoing COVID-19 pandemic, in-person gatherings have been restricted within the health authority, and all educational activities have been delivered online as self-learning modules. This is a reasonable option as adult learners are motivated and often self-directed (Candela, 2020; Knowles, 1989). An e-learning resource may be the most feasible option at present, though key stakeholders will be included in the decision-making process and their opinions will shape the development of the resource. This is also consistent with the findings from the systematic reviews by Sockalingham et al., (2014) and Yanamadala et al. (2013), as self-learning modules were one of the effective strategies for delivering POD education.

Conclusion

The findings of this literature review demonstrate that POD is a considerable challenge in acute surgical settings with negative implications for patient outcomes, nursing staff, the workplace environment, and the healthcare system at large. Of all healthcare professionals, nurses spend the most time caring for postoperative patients and are therefore in an ideal position to target this issue. To effect change, nurses must first be knowledgeable about evidence-based interventions that can prevent, identify, and manage POD. Findings from this literature review support the development of a learning resource that is an online self-learning module covering

topics of POD education, strategies for educating patients and families, early identification through validated tools (e.g., CAM), and effective prevention and management strategies for POD. Strategies to effectively deliver this education will include predisposing (i.e., the online self-learning module), enabling (i.e., handouts on the unit), and reinforcing (i.e., post-test feedback within the module) factors. The goal is that the resource will enhance knowledge and skills that can be utilized in nursing practice to reduce the incidence of POD and improve the overall quality of the workplace.

References

American Geriatrics Society (2014, October 10th). *Clinical practice guideline for postoperative delirium in older adults*. https://www.archcare.org/sites/default/files/pdf/ags-2014-clinical-practice-guideline-for-postop-delirium-in-older-adults.pdf

Bai, J., Liang, Y., Zhang, P., Liang, X., He, J., Wang, J., & Wang, Y. (2020). Association between postoperative delirium and mortality in elderly patients undergoing hip fractures surgery: A meta-analysis. *Osteoporosis International, 31*, 317-326. https://doi.org/10.1007/s00198-019-05172-7

Brooks, P., Spillane, J. J., Dick, K., & Stuart-Shor, E. (2014). Developing a strategy to identify and treat older patients with postoperative delirium. *AORN Journal, 99*(2), 257-273. https://doi.org/10.1016/j.aorn.2013.12.009

Bull, M. J., Boaz, L., Maadooliat, M., Hagle, M. E., Gettrust, L., Greene, M. T., Holmes, S. B., & Saczynski, J. S. (2016). Preparing family caregivers to recognize delirium symptoms in older adults after elective hip or knee arthroplasty. *Journal of the American Geriatrics Society, 65,* 13-17. https://doi.org/10.1111/jgs.14535

Candela, L. (2020). Theoretical foundations of teaching and learning. In D. M. Billings & J. A. Halstead (Eds.). *Teaching in nursing: A guide for faculty*. (pp. 247-269). St. Louis, MI: Elsevier.

Chen, C. C., Li, H., Liang, J., Lai, I., Purnomo, J. D. T., Yang, Y., Lin, B., Huang, J., Yang, C., Tien, Y., Chen, C., Lin, M., Huang, G., & Inouye, S. (2017). Effect of a modified hospital elder life program on delirium and length of hospital stay in patients undergoing abdominal surgery: A cluster randomized clinical trial. *JAMA Surgery, 152*(9), 827-834. https://doi.org/10.1001/jamasurg.2017.1083

Chevillon, C., Hellyar, M., Madani, C., Kerr, K., & Kim, S. C. (2015). Preoperative education on postoperative delirium, anxiety, and knowledge in pulmonary thromboendarterectomy patients. *American Journal of Critical Care, 24*(2), 164-171. https://doi.org/10.4037/ajcc2015658

Choi, J., Kim, K., Kang, M., Lee, Y., Koo, K., Oh, J. H., Park, Y. H., Suh, J., Kim, N., Yoo, H., Koo, J., Moon, H. M., Kim, E. H., Park, K., & Kim, C. (2019). Impact of a delirium prevention project among older hospitalized patients who underwent orthopedic surgery: A retrospective cohort study. *BMC Geriatrics, 19*(1). https://doi/org/ 10.1186/s12877-019-1303-z

Critical Appraisal Skills Programme (2018). *CASP qualitative checklist.* http://publications.gc.ca/collections/collection_2014/aspc-phac/HP40-119-2014-eng.pdf

DeCrane, S. K., Sands, L., Ashland, M., Lim, E., Tsai, T. L., Paul, S., & Leung, J. (2011). Factors associated with recovery from early postoperative delirium. *Journal of PeriAnesthesia Nursing, 26*(4), 231-241. https://doi.org/10.1016/j.jopan.2011.03.001

Denny, D. L. & Lindseth, G. N. (2020). Pain, opioid intake, and delirium symptoms in adults following joint replacement surgery. *Western Journal of Nursing Research, 42*(3), 165-176. https://doi.org/10.1177/0193945919849096

Government of Canada (2021). *Action for seniors report.* https://www.canada.ca/en/employment-social-development/programs/seniors-action-report.html#tc2a

Guo, Y. & Fan, Y. (2016). A preoperative, nurse-led intervention program reduces acute postoperative delirium. *Journal of Neuroscience Nursing, 48*(4), 229-235. https://foi.org/10.1097/JNN.0000000000000220

Guo, Y., Sun, L., Li, L., Jia, P., Zhang, J., Jiang, H., & Jiang, W. (2016). Impact of multicomponent, nonpharmacologic interventions on perioperative cortisol and melatonin levels and postoperative delirium in elderly oral cancer patients. *Archives of Gerontology and Geriatrics, 62*, 112-117. https://doi.org/10.1016/j.archger.2015.10.009

Guo, R. Y., Hshieh, T. T., Marcantonio, E. R., Cooper, Z., Jones, R. N., Travison, T. G., Fong, T. G., Abdeen, A., Lange, J., Earp, B., Schmitt, E. M., Leslie, D. L., & Inouye, S. K. (2021). One-year medicare costs associated with delirium in older patients undergoing major elective surgery. *JAMA Surgery, 156*(5), 462-470. https://doi.org/10.1001/jamasurg.2020.7260

Inouye, S. K., van Dyck, C. H., Alessi, C. A., Balkin, D., Siegal, A. P., & Horwitz, R. I. (1990). Clarifying confusion: The confusion assessment method. A new method for detection of delirium. *Annals of Internal Medicine, 113*(12), 941- 948. https://doi.org/ 10.7326/0003-4819-113-12-941

Inouye, S. K., Westendorp, R., & G. J., Saczynski, J. S. (2014). Delirium in elderly people. *Lancet, 383*, 911-922. https://doi.org/ 10.1016/S0140-6736(13)60688-1

Knowles, M. (1984). *Andragogy in action: Applying modern principles of adult learning*. Jossey-Bass

Knowles, M.S. (1989). *The making of an adult educator*. San Francisco, CA: Jossey-Bass.

Koirala, B., Hansen, B. R., Hosie, A., Budhathoki, C., Seal, S., Beaman, A., & Davidson, P. M. (2020). Delirium point prevalence studies in inpatient settings: A systematic review and meta-analysis. *Journal of Clinical Nursing, 29*, 2083-2092. https://doi.org/10.1111/jocn.15219

Kratz, T., Heinrich, M., Schlaub, E., & Diefenbacher, A. (2015). Preventing postoperative

delirium: A prospective intervention with psychogeriatric liaison on surgical wards in a general hospital. *Deusches Artzeblatt International, 112*, 289-296. https://doi.org/10.3238/arztebl.2015.0289

Lingehall, H. C., Smulter, N., Olofsson, B., & Lindahl, E. (2015). Experiences of undergoing cardiac surgery among older people diagnosed with postoperative delirium: One year follow-up. *BMC Nursing, 14*(17). https://doi.org/10.1186/s12912-015-0069-7

Meako, M. E., Thompson, H. J., & Cochrane, B. B. (2011). Orthopaedic nurses' knowledge of delirium in older hospitalized patients. *Orthopaedic Nursing, 30*(4), 241-248. https://doi.org/10.1097/NOR.0b013e3182247c2b

Oberai, T., Killington, M., Laver, K., Crotty, M., & Jaarsma, R. (2019). "Just another piece of paperwork": Perceptions of clinicians on delirium screening following hip fracture repair elicited in focus groups. *International Psychogeriatric, 31*(6), 877-884. https://doi.org/10.1017/S1041610218001369

Pollard, C., Fitzgerald, M., & Ford, K. (2015). Delirium: The lived experience of older people who are delirious post-orthopedic surgery. *Mental Health Nursing, 24*, 213-221. https://doi.org/10.1111/inm.12132

Public Health Agency of Canada (2014, July). *Infection prevention and control guidelines: Critical appraisal tool kit.* http://publications.gc.ca/collections/collection_2014/aspc-phac/HP40-119-2014-eng.pdf

Schenning, K. J. & Deiner, S. G. (2015). Postoperative delirium in the geriatric patient. *Anesthesiology Clinics, 33*(3), 505-516. https://doi.org/10.1016/j.anclin.2015.05.007

Silva, A. R., Regueira, P., Albuquerque, E., Baldeiras, I., Cardoso, A. L., Santana, I., & Cerejeira, J. (2021). Estimates of geriatric delirium frequency in noncardiac surgeries and

its evolution across the years: A systematic review and meta-analysis. *JAMDA, 22*(3), 613-620. https://doi.org/10.1016/j.jamda.2020.08.017

Sockalingham, S., Tan, A., Hawa, R., Pollex, H., Abbey, S., & Hodges, B. D. (2014). Interprofessional education for delirium care: A systematic review. *Journal of Interprofessional Care, 28*(4), 345-351. https://doi.org/10.3109/13561820.2014.891979

Statistics Canada (2020, September 17). *Population projections for Canada (2018 to 2068), provinces and territories (2018 to 2043).* https://www150.statcan.gc.ca/n1/pub/91-520-x/2019001/sect03-eng.htm

Sturm, H., Wildermuth, R., Stolz, R., Bertram, L., Eschweiler, G. W., Thomas, C., Rapp, M., & Joos, S. (2019). Diverging awareness of postoperative delirium and cognitive dysfunction in German health care providers. *Clinical Interventions in Aging, 14*, 2125-2135. https://doi.org/10.2147/CIA.S230800

Thomas, N., Coleman, M., & Terry, D. (2021). Nurses' experiences of caring for patients with delirium: Systematic review and qualitative evidence synthesis. *Nursing Reports, 11*(1), 164-174. https://doi.org/10.3390/nursrep11010016

Todd, K. S., Barry, J., Hoppough, S., & McConnell, E. (2015). Delirium detection and improved delirium management in older patients hospitalized for hip fracture. *International Journal of Orthopaedic and Trauma Nursing, 19*, 214-221. https:/doi.org/10.1016/j.ijotn.2015.03.005

van Velthuijsen, E. L., Zwakhalen, S. M. G., Warnier, R. M. J., Mulder, W. J., Verhey, F. R. J., & Kempen, G. I. J. M. (2016). Psychometric properties and feasibility of instruments for the detection of delirium in older hospitalized patients: A systematic review. *International Journal of Geriatric Psychiatry, 31*(9), 974-989.

https://doi.org/10.1002/gps.4441

Wang, Y., Yue, J., Xie, D., Carter, P., Li, Q., Gartganis, S. L., Chen, J., & Inouye, S. K. (2020). Effect of the tailored, family-involved hospital elder life program on postoperative delirium and function in older adults: A randomized clinical trial. *JAMA Internal Medicine, 180*(1), 17-25. https://doi.org/10.1001/jamainternmed.2019.4446

Watt, J., Tricco, A. C., Talbot-Hamon, C., Pham, B., Rios, P., Grudniewicz, A., Wong, C., Sinclair, D., & Straus, S. E. (2018). Identifying older adults at risk of delirium following elective surgery: A systematic review and meta-analysis. *Journal of General Internal Medicine, 33*(4), 500-509. https://doi.org/10.1007/s11606-017-4204-x

Xue, X., Wang, P., Wang, J., Li, X., Peng, F., & Wang, Z. (2020). Preoperative individualized education intervention reduces delirium after cardiac surgery: A randomized controlled study. *Journal of Thoracic Disease, 12*(5), 2188-2196. https://doi.org/10.21037/jtd.2020.04.26

Yanamadala, M., Wieland, D., & Heflin, M. T. (2013). Educational interventions to improve recognition of delirium: A systematic review. *Journal of the American Geriatrics Society, 61*(11), 1983-1993. https://doi.org/10.1111/jgs.12522

Zhang, W., Sun, Y., Liu, Y., Qiu, W., Ye, X., Zhang, G., & Zhang, L. (2017). A nursing protocol targeting risk factors for reducing postoperative delirium in patients following coronary artery bypass grafting: Results of a prospective before-after study. *International Journal of Nursing Sciences, 4*(2), 81-87. https://doi.org/10.1016/j.ijnss.2017.02.002

Appendix: Literature Summary Table

Key Question: What is known about the impact of nursing knowledge and interventions on the prevention, identification, and management of POD?

Study/Design	Methods	Key Results	Comments
Authors: **Chen** et al. (2017) Title: Effect of a modified hospital elder life program on delirium and length of hospital stay in patients undergoing abdominal surgery: A cluster randomized clinical trial. Design: RCT Purpose: to determine if a modified version of the Hospital Elder Life Program (mHELP) will reduce hospital length of stay and incident delirium in patients after abdominal surgery.	N: 377 participants aged 65 and older undergoing abdominal surgery. Setting: Two 36-bed GI wards from one 2000-bed hospital in Taipei, Taiwan. Intervention: 197 participants who received the mHELP intervention. Consisted of 3 nursing protocols of orienting communication (i.e., daily conversations/orientation techniques), early mobilization (i.e., ambulation or ROM exercises TID), and nutritional assistance (i.e., oral care, diet education, and encouraging oral intake). mHELP RNs assigned only to intervention group. Control: 180 participants who received usual care (e.g., mobility encouraged but no TID target). Data Collection: •**Presence of POD**: measured by CAM (V&R). Positive CAM identified presence of delirium. Monitored daily from Mon-Sat. •**Length of Stay**: measured in days taken from medical record on D/C. Data Analysis: Kaplan-Meier analysis, log-rank test, ANOVA	**Presence of POD:** n (%) Intervention: 13 (6.6%) Control: 27 (15.1%) p = 0.008 RR with mHELP = 56% **Length of Stay:** median Intervention: 12.0 Control: 14.0 p = 0.04	Strength of Design: **Strong** Quality: **High** Issues: •Delay in starting mHELP if participant in ICU post-op. •Participants received care from same nurses and surgeons possibly causing contamination. Still had significant findings with intervention, so unlikely an issue.

Authors: **Choi** et al. (2019) Title: Impact of a delirium prevention project among older hospitalized patients who underwent orthopedic surgery: A retrospective cohort study Design: Cohort study Purpose: A. Evaluate the performance of a POD screening tool. B. Determine if a quality improvement project with multicomponent prevention strategies would improve patient outcomes. C. Determine knowledge improvement among staff after POD education.	N: 549 adults 65 and older undergoing ortho surgery. Setting: Two ortho units from hospital in South Korea. Intervention: 275 participants screened for risk factors of POD, received prevention intervention, and increased assessment. RN intervention consisted of pain assessment/control, sleep promotion, and use of sensory aids (e.g., glasses). List of medications to avoid (e.g., lorazepam) and medication review by pharmacists. Geriatricians evaluated vitals and fluid-electrolyte balance. Cohort: 274 participants from cohort pre-intervention received usual care prior to implementation of these interventions by RNs, pharmacists, and geriatricians. Education Intervention: 30 min training for staff on pathophysiology, risk factors, prevention, screening, and management of POD. Delivered by GNS or geriatrician. Data Collection: • Staff RNs delivered screening tool. Prevention intervention by RNs, pharmacists, and geriatricians. • **Performance of ST:** sensitivity and specificity. • **Effect of PI:** delirium rates/odds ratio • **Effect of EI:** knowledge scores Data Analysis: Performance of ST and effect of PI determined with logistic regression models.	**Performance of ST:** • 17 diagnosed with POD and 16 of these screened high-risk. • Sensitivity; 94.1% • Specificity: 72.7% **Effect of PI:** Intervention; 6.2% POD Control: 10.2% POD OR: 0.316 (CI 0.125-0.800, p = 0.015) **Effect of EI:** Pre-test: 40.52 Post-test: 43.24 $p < 0.001$	Strength of Design: **Strong** Quality: **Medium** Issues: • Potential confounders from control group who were monitored before intervention. POD determined from chart review. • No valid diagnostic tool used to diagnose POD. Left to interpretation of physicians and could vary between.

Authors: **Guo** et al. (2016) Title: Impact of multicomponent, nonpharmacologic interventions on perioperative cortisol and melatonin levels and postoperative delirium in elderly oral cancer patients Design: RCT Purpose: Determine the impact of a MNI on POD, cortisol levels, and melatonin levels in oral cancer patients undergoing tumour resection surgery.	N: 160 participants b/w ages 65 and 80 undergoing tumour resection surgery for oral cancer. Randomly assigned with intervention or control group with a sealed envelope technique. Setting: SICU in Shanghai, China. Intervention: 81 participants received MNI (orientation techniques, sleep promotion, avoidance of catheters and restraints). Control: 79 participants received usual care which did not include the routine use of the specific MNI interventions. Data Collection: • Assessed POD BID for first 3 post op days. • Assessments by same researcher who was blinded to groups. • **Presence of POD:** RASS/CAM-ICU (V&R) • **Duration of POD:** hours Data Analysis: • Continuous variables as means with standard deviations. • Categorical data as numbers • Intragroup numerical data with repeated measures ANOVA. • Nominal data analyzed with Chi-squared test	**Presence of POD: n (%)** *Day 1* Intervention: 4 (7.50%) Control: 13 (16.25%) p = 0.035 *Total* Intervention: 10 (15.00%) Control: 25 (31.25%) p = 0.006 **Duration of POD: n +/- SD** Intervention: 28.1 +/- 8.6 Control: 60.2 +/- 15.8 p < 0.001	Strength of Design: **Strong** Quality: **Medium** Issues**:** •Same physicians caring for both groups. Risk of contamination of control group. Nurses delivering MNI did not care for control group. •Some interventions cannot be easily measured (e.g., noise reduced as much as possible). Cannot then measure effect of those specific interventions.

Authors: **Guo & Fan** (2016) Title: A preoperative, nurse-led intervention program reduces acute postoperative delirium Design: NRCT Purpose: Evaluate if a multicomponent intervention could reduce POD in the ICU.	N: 122 participants undergoing abdominal or cardiac surgery requiring ICU stay postop. Assigned to groups based on odd or even last digit of their patient identification number. Setting: Teaching hospital of Harbin Medical University, China. Intervention: 59 participants received POD prevention intervention. Included introducing patients to ICU preop, supporting familial relationships, and promoting uninterrupted sleep. Control: 63 participants received usual care in which there were no ICU tours, routine family visits, and no interventions to promote sleep. Education Intervention: 16 ICU nurses received POD education about clinical features, risk factors, symptoms, and early identification. Data Collection: • DDS used to detect POD at 2, 4, 8. 16, and 24 hours postop by EI nurses. • DDS: <9= no delirium, 10-14= mild delirium, 15-19 moderate delirium, and >19= severe delirium. • **Presence of POD:** mean DDS scores • **Severity of POD:** number of mild/moderate/severe POD cases Data Analysis: • DDS scores compared with independent *t* tests. Continuous variables tested with Mann-Whitney *U* test.	**Presence of POD:** n (+/-SD) *24 hours postop* Intervention: 6.65 (1.88) Control: 10.37 (4.96) p < 0.001 • Significant differences noted at all time points **Severity of POD:** n *24 hours postop* Intervention: *Mild:* 4 *Moderate:* 0 *Severe:* 0 Control: *Mild:* 12 *Moderate:* 2 *Severe:* 1 p < 0.001	Strength of Design: **Strong** Quality: **Medium** Issues: • Physicians may have carried over some interventions to control group as they cared for both groups. • Unable to blind researchers to intervention and control groups. Potential to bias DDS scores.

Authors: **Kratz** et al. (2015) Title: Preventing postoperative delirium: A prospective intervention with psychogeriatric liaison on surgical wards in a general hospital Design: CBA Purpose: A. Examine the incidence of POD on a general surgery unit. B. Determine predictive preoperative factors. C. Determine if non-pharmacological interventions form a geriatric psych nurse can reduce incident POD.	N: 125 participants undergoing general surgery over 70 years of age. Setting: Two general surgery units from one teaching hospital in Germany. Intervention: one unit of 61 participants received POD prevention intervention (individualized plan of orientation techniques, sleep promotion, early mobilization, family support, improved nutrition, structured schedule). Control: second unit of 53 participants received usual care (i.e., no individualized plan with preventative techniques). Data Collection: • Intervention delivered by geriatric psych nurse. • **POD Rates:** measured by CAM (V&R) Data Analysis: • No written details provided about statistical tests used but can tell that Mann-Whitney *U* test and Fisher's exact test were completed.	**POD Rates: n (%; CI)** Intervention: 3 (4.9%; 95%CI: 0.0 – 11.5) Control: 11 (20.8%; 95%CI: 11.3-32.1) p = 0.01 OR: 0.22; 95%CI:0.05–0.98; p=0.046	Strength of Design: **Strong** Quality: **Medium** Issues: • Varying degrees to which each intervention was applied to each participant (i.e., individualized plan). • Some differences between intervention and control group. Intervention group had significantly more participants admitted from an institution than their own home and with greater functional/physical impairment. However, still had significant results with intervention group.

Authors: **Meako** et al. (2011) Title: Orthopedic nurses' knowledge of delirium in older hospitalized patients Design: UCBA Purpose: A. Determine nurses' existing knowledge about POD in elderly patients. B. Evaluate the effectiveness of an educational intervention focused on POD.	N: 23 orthopedic RNs who received an educational intervention about POD. Setting: 39-bed orthopedic unit at a hospital, in USA. Educational Intervention: 50-minute in-person lecture using PowerPoint slides. Done over a few days on different shifts to reach all RNs. Data Collection: • Demographic questionnaire • Pre- and post-tests had 10 multiple choice each. • Pre-test and questionnaire in-person before intervention, then post-test done immediately after. • 57.5% participation rate. • **POD knowledge:** Mean pre- and post-test scores Data Analysis: • Paired *t* tests, one-way ANOVA with post hoc Scheffé, and Pearson correlations.	**POD Knowledge: mean test score** Pre-test: 5.42 Post-test: 8.9 p = 0.0005 • Significant difference also found b/w years of experience and change score with those with 0-2 years of nursing experience having the highest mean change score (p = 0.039)	Strength of Design: **Weak** Quality: **Medium** Issues: • Did not assess for retention of knowledge. Post-test data only collected immediately after intervention. • Low participation rate.

Authors: **Zhang** et al. (2017) Title: A nursing protocol targeting risk factors for reducing postoperative delirium in patients following coronary artery bypass grafting: Results of a prospective before-after study Design: CBA Purpose: Examine if a nursing prevention intervention for patients undergoing CABG would decrease POD.	N: 278 participants undergoing CABG Setting: Cardiothoracic ICU in China. Intervention: 141 participants received prevention intervention (sleep promotion, pain control, orientation strategies, family visitation, and early catheter removal). Control: 137 participants received usual care which was a standard care plan used prior to development of the intervention and did not include the specific prevention strategies. Data Collection: • POD assessments by trained RNs and assured by physicians. • Assessed for 7 days postop. • **Presence of POD:** RASS/CAM-ICU (V&R) • **ICU Stay:** days Data Analysis: Pearson chi-square test, Fisher's exact test, Student's *t* test	**Presence of Delirium: n (%)** Intervention: 19(13.48%) Control: 41 (29.93%) p = 0.001 **ICU Stay: n (IQRs)** Intervention: 3 (2,3) Control: 3 (3,5) p < 0.001	Strength of Design: **Strong** Quality: **Medium** Issues: • Unclear if intervention and control groups were cared for by same nurses and physicians. Baseline difference between control and intervention group related to placement of anastomosis (i.e., graft connection) during surgery.

Legend: RCT: randomized controlled trial; gastrointestinal; RN: Registered Nurse; POD: postoperative delirium; CAM: Confusion Assessment Method; Mon: Monday; Sat: Saturday; D/C: discharge; RR: risk reduction; post-op: postoperatively; ROM: range of motion; TID: three times a day; V&R: valid and reliable; ANOVA: analysis of variance; CBA: controlled before after study; ortho: orthopedic; GNS: geriatric nurse specialist; ST: screening tool; PI: prevention intervention; EI: education intervention; OR: odds ratio; MNI: multicomponent nonpharmacologic intervention; b/w: between; SICU: surgical intensive care unit; BID: twice daily; RASS: Richmond Agitation Sedation Scale; CAM-ICU: Confusion Assessment Method – Intensive Care Unit; SD: standard deviation; NRCT: non-randomized controlled trial; ICU: intensive care unit; preop: preoperatively; DDS: delirium detection score; UCBA: uncontrolled before-after study; USA: United States of America; CABG: coronary artery bypass grafting; IQR: interquartile range

Appendix II: Environmental Scan Report

Environmental Scan Report: Development of a resource on postoperative delirium for nurses working in acute surgical settings

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Postoperative delirium (POD) is a frequent complication in elderly patients after surgical intervention which results in a sudden change in cognitive function (American Geriatrics Society [AGS], 2014; Inouye et al., 2014; Schenning & Deiner, 2015). This presents many challenges within acute care settings, and this condition is often difficult to identify and manage. As many cases of POD are thought to be avoidable, there are several recommendations for preventative measures in the clinical setting and ongoing education for healthcare professionals (AGS, 2014; Ontario Health [OH], n.d.; Registered Nurses' Association of Ontario [RNAO], 2016).

This practicum project is focused on the development of a learning resource on the prevention, identification, and management of POD for nurses working in acute surgical settings. This was decided based on findings from a recent literature review in which there was strong evidence to suggest that educational interventions for healthcare professionals may be effective in reducing rates of POD and improving knowledge scores (Choi et al., 2019; Guo & Fan, 2016; Sockalingham et al., 2014; Yanamadala et al., 2013). The purpose of this environmental scan is to determine if there are existing policies, protocols, or educational materials being used by other health authorities within Atlantic Canada or publicly available from reputable Canadian or international organizations. This is essential as these materials may help to inform the development of a learning resource on POD for nurses working in this surgery program.

Brief Overview of the Project

The setting for the practicum project is an orthopedic unit from a large city hospital in an Atlantic Canadian province that services patients requiring surgery for a variety of orthopedic issues. Since the implementation of an organizational directive in 2016, all patients sustaining hip fractures within the health authority are transferred this orthopedic unit for surgical fixation. This has led to an older adult population than previously noted, who often have complex health

and social issues. In preliminary discussions with the nursing staff, unit manager, surgical nurse educator, and patient care facilitator, it was determined that POD was a complication of considerable concern on this unit and could be more effectively addressed.

Presently, when patients on the unit are identified as experiencing POD, the medical team orders an organizational delirium protocol that is carried out by nursing staff. At times, the ACE (i.e., acute care of the elderly) team is consulted. Since the beginning of this practicum project, the delirium management protocol for the health authority was updated to include a more comprehensive order set including pharmacologic and nonpharmacologic management strategies and a pamphlet that can be used when educating families (Babb et al., 2021). However, there is no mention or encouragement of preventative measures that should be utilized within the clinical setting before the onset of delirium (e.g., sleep promotion). There are no delirium prevention protocols on the unit, though the preoperative and postoperative order sets were created in consideration of the needs of a geriatric patient population. There are also no educational materials available on the unit or routinely presented in orientation that cover POD. This is concerning, as this may contribute to a knowledge gap on POD and negatively impact the identification of POD in patients on the unit. As well, several recent studies have noted that many nurses who care for patients with POD have a knowledge deficit and desire further education (Meako et al., 2011; Oberai et al., 2019; Thomas et al., 2021). The results of the integrative literature review determined that there was strong evidence to support the development of an educational resource for surgical nurses about the prevention, identification, and management of POD.

Specific Objectives for the Environmental Scan

The objectives of the environmental scan were to:

1. Identify any existing educational materials from hospitals within Atlantic Canada that are used for educating surgical nurses about POD or used by surgical nurses when educating patients and families;
2. Identify any existing policies or protocols regarding POD from hospitals within Atlantic Canada that are utilized by surgical nurses in their practice;
3. Identify any educational materials (i.e., nursing or public) that are available on the internet from reputable Canadian or international organizations. These websites included health authorities, nursing associations, and non-profit groups of healthcare professionals advocating for geriatric health; and
4. Identify and analyze commonalities between the retrieved materials to determine what information can be adapted for use or influence the development of the resource.

Methods

Two sources of information were used to inform this environmental scan. These included materials from health facilities within Atlantic Canada and reputable, educational websites. Unit managers or nurse educators from nine hospitals within Atlantic Canada were contacted by email to request any educational materials, policies, or protocols addressing POD used in their health facilities. See Appendix A for a copy of this email. It was noted within the email that any materials sent would be kept confidential and only viewed by myself and my practicum supervisor. It was also stated that permission would be explicitly requested if the materials were to be utilized within the final resource. Nine representatives were emailed on May 26th, 2021, with a request for a response by June 1st, 2021.

While awaiting these responses, an internet search was completed for websites that shared educational materials, policies, or protocols related to the care of patients with POD. A

total of seven educational, reputable websites were chosen to inform the environmental scan. These included two nursing associations (American Nurses Association [ANA], n.d.; RNAO, 2016), one nursing education publisher (Moyle, 2020), two non-profit organizations (AGS, 2014; Canadian Coalition for Seniors Mental Health [CCSMH], 2009), and two Canadian health authorities (Nova Scotia Health Authority [NSHA], n.d.; OH, n.d.).

Health Facilities

One facility from each health authority was chosen within the larger towns and cities across Newfoundland and Labrador (NL), New Brunswick (NB), Nova Scotia (NS), and Prince Edward Island (PEI). See Appendix B for a list of health facilities that were chosen and their respective health authorities. The Atlantic Canadian region was selected as it is most similar to the patient population in this health authority, due to advancing age and geographical location. These provinces have the highest proportion of older adults (i.e., aged 65 and older), which is projected to continue through to 2043 (Statistics Canada, 2020a; Statistics Canada 2020b). This is particularly concerning for NL, as the percentage of older adults is expected to reach between 30.9% and 35.8% by 2043, compared to the most recently noted rate of 20.5% in 2018 (Statistics Canada, 2020b).

Using available information on the health facility websites, contact information for unit managers or nurse educators from the surgery departments was retrieved and emails were sent regarding the request for materials. In cases where this contact information was not available, general facility emails were used with the request that the information be forwarded to the appropriate individual(s). The email provided general information about the practicum project, my personal contact information, and a request for educational materials, policies, or protocols related to the nursing care of patients experiencing POD.

Websites

A Google search was conducted to identify websites that shared educational materials, policies, or protocols related to the nursing care of patients with POD. Search terms consisted of various combinations of "postoperative delirium", "delirium", "nursing", "prevention", "identification", "management", "nursing education", "patient education", "family education", "policy", and "protocol". Websites from reputable Canadian and international health authorities or organizations were considered to ensure the information was reliable and appropriate for the environmental scan. The websites of the health authorities noted in Appendix B were also searched. The goal of this online search was to retrieve any materials that were related to nursing education or interventions aimed at the prevention, identification, or management of POD. In cases where there was limited information about POD, resources that provided information on delirium that was applicable to the surgical setting were considered. This was determined to be appropriate as many of the prevention, identification, and management strategies are the same or similar to those for POD. Approximately 25 websites were retrieved and reviewed for their relevance to the environmental scan. After examining the information presented in those websites, a total of seven were selected to inform the environmental scan due to their relevancy and reliability (AGS, 2014; ANA, n.d.; CCSMH, 2009; Moyle, 2020; NSHA, n.d.; OH, n.d.; RNAO, 2016).

Data Collection, Management, and Analysis

Data were collected through a review of the materials emailed by the health facility representatives or observed on the selected websites. Through a review of recent scholarly literature, strong evidence was noted to suggest that educational interventions related to POD may be effective in improving nurses' knowledge scores and reducing POD rates (Choi et al.,

2019; Guo & Fan, 2016; Sockalingham et al., 2014; Yanamadala et al., 2013). This data has helped to guide this practicum project, as the goal is to develop a learning resource for surgical nurses about the prevention, identification, and management of POD. Therefore, materials were only deemed relevant and collected if they pertained to this topic. To ensure consistency and quality of the environmental scan, all materials were examined to confirm they were relevant, as well as current and reputable.

All email correspondence and materials retrieved during the data collection phase were stored on a password-protected laptop and kept confidential. Information was only shared with the supervisor of this practicum project. The materials were sorted into similar categories (e.g., nursing education) and analyzed to determine commonalities. This consisted of reading through the materials several times to note the most important topics. The important points from each resource were then compared to determine themes noted across the data. Recommendations for ongoing education for healthcare professionals, use of prevention strategies, early identification, management protocols, and education for families were noted to be common trends. These commonalities were summarized in Table 1 and Table 2.

Ethical Considerations

To determine if the practicum project required ethical review by the Health Research Ethics Authority (HREA), the HREA screening tool was completed. As the project is focused on quality improvement, it was determined that an HREA review was not required. A completed copy of this screening tool can be found in Appendix C.

To ensure ethical standards were upheld, several strategies were utilized during the execution of the environmental scan. All necessary information was provided to the managers and nurse educators via email, including the sharing of information with the practicum

supervisor. Voluntary consent was implied from their email responses and offerings of available materials. The health facility representatives were also made aware that if their material were to be utilized within the resource, that further written permission would be requested. All emails and materials were safely stored on a private, password-protected laptop. All confidential information will be permanently deleted from the laptop hard drive after the completion of the practicum project.

Results

Through the process of the environmental scan, information related to the prevention, identification, and management of POD was assessed. This included educational materials for nurses, patients, families, and caregivers. There were limited responses from health facility representatives, as only one responded and supplied an educational resource used for staff orientation (Price, n.d.). This orientation slideshow, along with the seven chosen websites and the newly updated delirium management protocol released on June 29th, 2021, were reviewed and analyzed for the environmental scan (AGS, 2014; ANA, n.d.; Babb et al, 2021; CCSMH, 2009; Moyle, 2020; NSHA, n.d.; OH, n.d.; RNAO, 2016). The important topics from each of these resources are outlined in Table 1 and Table 2.

Responses

Of the nine emails sent to the chosen health facilities, four initial responses were noted. Two of these responses were to indicate that the emails had been forwarded to the appropriate individuals. The other two emails received from managers or nurse educators stated they would seek the requested information. However, only one of these representatives forwarded material. They indicated that there were no policies or protocols used in their facility, though they were able to retrieve an educational resource designed for nurses working in the post-anesthesia care

unit (PACU). Of the many topics covered in the resource, emergence delirium was highlighted (Price, n.d.). This resource was useful, though there was limited information, and the material was mostly specific to emergence delirium in the PACU setting. For this reason, written permission to directly utilize the material within the learning resource was not requested.

Resource Content

Several resources delivered education on delirium to varying degrees for healthcare professionals (Babb et al., 2021; NSHA, n.d.; OH, n.d., Price, n.d.; RNAO, 2016). The American Geriatrics Society (2014) and Moyle (2020) were noted to have focused specifically on POD within the acute surgical setting. The CCSMH (2009) and NSHA (n.d.) websites presented a booklet and online resource, respectively, for families and caregivers. These can be accessed publicly by families or used by healthcare professionals when providing education. Similar topics were covered within these resources, though they were presented at an appropriate learning level for the general public (CCSMH, 2009; NSHA, n.d.).

Although there were several reputable resources, there was no single, comprehensive POD educational resource noted for healthcare professionals (e.g., self-learning module). Rather, information was presented in the resources in the form of practice recommendations (AGS, 2014; ANA, n.d.; RNAO, 2016), quality standards (OH, n.d.), an educational article (Moyle, 2020), an orientation slideshow (Price, n.d.), and an organizational policy (Babb et al., 2021). An overview of the resources is outlined below in Table 1.

Table 1

Postoperative Delirium Resources

Resource	Organization Type	Format	Topic
American Geriatrics Society (2014)	Non-profit organization	PDF: Clinical practice guidelines	POD

American Nurses Association (n.d.)	Nursing association	PDF: Practice recommendations	Delirium
Babb et al. (2021)	Health authority	Policy: Delirium screening and management	Delirium
Canadian Coalition for Seniors' Mental Health (2009)	Non-profit organization	PDF: Booklet for families and caregivers	Delirium
Moyle (2020)	Nursing education publisher	Website: Article	POD
Nova Scotia Health Authority (n.d.)	Health authority	Website: Information for families and healthcare professionals	Delirium
Ontario Health (n.d.)	Health authority	PDF: Quality standards	Delirium
Price (n.d.)	Health authority	PDF: Slideshow	Emergence delirium
Registered Nurses' Association of Ontario (n.d.)	Nursing association	PDF: Clinical practice guidelines	Delirium

Analysis of the health facility materials and websites revealed that many of these resources highlighted similar information and guidelines for the care of patients experiencing POD. The content of each resource is outlined below in Table 2. From this content, five main themes were noted including comprehensive POD education, use of prevention strategies, early identification, management strategies, and education for families and caregivers.

Table 2

Synthesis of Resource Content Available on Postoperative Delirium

	AGS (2014)	ANA (n.d.)	Babb et al. (2021)	CCSMH (2009)	Moyle (2020)	NSHA (n.d.)	OH (n.d.)	Price (n.d.)	RNAO (2016)
Education									
Signs/Symptoms	●		●	●	●	●	●	●	●
Causes			●	●	●	●	●	●	
Risk Factors	●	●		●	●	●	●	●	●
Outcomes	●			●	●	●	●	●	
Encouraged ongoing education	●	●			●		●		●

Prevention									
Pain control	●	●	○	○			●	○	●
Orientation techniques	●	●	○		●		●		●
Early mobility	●	●	○		●		●		●
Avoid urinary catheters		●	○				●		●
Avoid restraints		●	○		●		●		●
Promote nutrition & hydration	●	●	○	○		○	●		●
Bowel management	●	●	○				●		●
Sensory assistance	●	●	○	○		○	●		●
Sleep promotion	●	●	○	○	●	○	●		●
Adequate oxygenation	●	●							●
Family visits			○	○			●		●
Safe environment			○	○				○	●
Identification									
Frequent assessment		●	●	●		●	●		●
Validated screening tools		●	●				●		●
Management									
Encouraged protocols	●		●				●		●
Continue prevention strategies	●			●	●				●
Treat any underlying cause	●		●				●		●
Families									
Treatment expectations			●	●		●	●		
How to care for patient			●	●		●	●		
Encouraged family education		●	●	●		●	●		●

● = content was included within the resource

○ = resource mentioned the use of these strategies, but only for the management of POD rather than prevention.

Delirium Education

Through an analysis of the resources, it was noted that delirium is a fluctuating, sudden cognitive change that can present as either hyperactive (e.g., agitation), hypoactive (e.g., drowsiness), or mixed symptoms (i.e., combination of hyperactive and hypoactive symptoms; AGS, 2014; Babb et al., 2021; OH, n.d.). Examples of specific symptoms were also included, such as disorientation, language disturbances, inability to focus, and memory disturbances (Moyle, 2020; Price, n.d.). It was commonly noted that delirium has no singular cause, but rather can be triggered by several different causes, such as infection, malnutrition, or surgical intervention (Babb et al., 2021; Moyle, 2020; OH, n.d., RNAO, 2016).

Risk factors for delirium were outlined, which included advanced age, preoperative cognitive impairment, decreased physical function, and pre-existing medical conditions (AGS, 2014; ANA, n.d.; Moyle, 2020; OH, n.d.; Price, n.d.; RNAO, 2016). Increased mortality, delayed recovery, injuries, and prolonged hospitalization were noted to be some of the potential outcomes for patients experiencing delirium (AGS, 2014, Moyle, 2020; OH, n.d.; Price, n.d.). The encouragement of ongoing delirium education for healthcare professionals was also noted by several resources (AGS, 2014; ANA, n.d.; Moyle, 2020; OH, n.d.; RNAO, 2016) While each of the resources was informative, there was no singular source that thoroughly covered all topics.

Prevention Strategies

Delirium has been noted to be avoidable in up to 40% of cases, and the importance of prevention was highlighted in several of the resources (AGS, 2014; ANA, n.d.; CCSHM, 2009; Moyle, 2020; NSHA, n.d.; OH, n.d.; RNAO, 2016). It was suggested that prevention strategies should be utilized in the practice setting by nurses and other healthcare professionals. While several strategies were emphasized, sleep promotion, early mobility, and orientation techniques were encouraged by each of the websites regarding education for healthcare professionals (AGS,

2014; ANA, n.d.; Moyle, 2020; OH, n.d.; RNAO, 2016). It was suggested that daytime napping be limited, noise levels reduced, disruptions limited, and lights dimmed to promote quality sleep. The American Nurses' Association (n.d.) also promoted the use of relaxation techniques, calming music, and toileting before bedtime to help encourage sleep. The resources focused on maintaining cognitive function through orientation techniques such as introducing oneself when entering the patient room, encouraging familiar objects, and noting the time of day to the patient (AGS, 2014; ANA, n.d.; Moyle, 2020; OH, n.d.; RNAO, 2016). As well, mobility was encouraged as medically appropriate and with the use of any necessary assistive devices (AGS, 2014; ANA, n.d.; Moyle, 2020; OH, n.d.; RNAO, 2016). In terms of surgical patients, early and aggressive mobility was encouraged whenever possible (AGS, 2014; RNAO, 2016).

While not mentioned in every resource for healthcare professionals, pain control, sensory assistance, bowel management, and adequate nutrition and hydration were still noted to be important delirium prevention techniques (AGS, 2014; ANA, n.d.; OH, n.d.; RNAO, 2016). Pain management requires the use of appropriate pain assessment tools, ongoing monitoring, and both pharmacologic and nonpharmacologic interventions (ANA, n.d.). Patients should be encouraged to use any necessary sensory assistive devices (e.g., hearing aids) and nurses should assist patients with bowel management (e.g., encouraging toileting and providing medication as needed) to avoid constipation (AGS, 2014; ANA, n.d.; OH, n.d.; RNAO, 2016). Nurses should also assess nutrition and hydration status, assist with meals if appropriate, and monitor the need for a dietician consult (ANA, n.d.; RNAO, 2016).

Finally, avoidance of urinary catheters (ANA, n.d.; OH, n.d.; RNAO, 2016), encouragement of family visitation (OH, n.d.; RNAO, 2016), confirmation of adequate oxygenation (AGS, 2014; ANA, n.d.; RNAO, 2016), and avoidance of physical restraints

(Moyle, 2020; OH, n.d.; RNAO, 2016) were also highlighted. The organization's policy (Babb et al., 2021) and resource by Price (n.d.) mentioned several of these outlined strategies as noted above in Table 2; However, they were only noted as management strategies for patients who have already been determined to be delirious. Similarly, CCSMH (2009) and NSHA (n.d.) only emphasized these strategies in terms of management of delirium. The techniques were also targeted for families and caregivers rather than healthcare professionals (e.g., bringing some familiar patient belongings into the hospital setting; CCSMH, 2009; NSHA, n.d.). This is consistent with findings from the literature about the importance of educating family members, as they can contribute to the care of patients with POD (Bull et al., 2016; Wang et al., 2020).

Overall, these results were similar to the findings from the literature review of which there was evidence to suggest that prevention interventions are likely to reduce rates of POD (Choi et al., 2019; Chen et al., 2017; Guo et al., 2016; Guo & Fan, 2016; Kratz et al., 2015; Zhang et al., 2017). The prevention strategies outlined in the resources were noted to be practical tips that can be applied in the surgical setting. It was also noted that these techniques were mainly nonpharmacologic. This can be accomplished through nursing interventions, without the use of a formal prevention protocol. However, there must first be comprehensive education for nursing staff regarding prevention strategies for POD.

Early Identification

Delirium is often misdiagnosed or unrecognized within the clinical setting due to the fluctuating nature and similarities to other conditions (e.g., dementia; AGS, 2014; OH, n.d.). It was noted throughout many of the resources that it is essential for healthcare professionals to conduct frequent cognitive assessments to address this issue (ANA, n.d.; Babb et al., 2021; OH, n.d.; RNAO, 2016). Families and caregivers are also vital resources in this assessment, as they

are familiar with the patient's baseline cognition (Babb, 2021; CCSHM, 2009; NSHA, n.d.).

It was noted by several resources that delirium should be assessed through validated screening tools (ANA, n.d.; Babb et al., 2021; OH, n.d.; RNAO, 2016). Numerous screening tools were suggested including, the 4 A's test (4AT), Confusion Assessment Method (CAM), Confusion Assessment Method-Intensive Care Unit (CAM-ICU), Delirium Triage Screen (DTS), and Nursing Delirium Screening Scale (Nu-DESC; Babb et al., 2021; OH, n.d.; RNAO, 2016). These findings were similar to those from the literature review, in which the CAM and Nu-DESC tools were noted to be valid, reliable, and commonly used within the literature (van Velthuijsen, 2016) Currently, the CAM is the tool utilized within the health authority for cognitive screening. The goal of using these validated screening tools is to quickly identify delirium as to prevent any delays in treatment or poor outcomes. To ensure early detection of POD in the clinical setting, nurses must be educated about the importance of frequent assessments with validated screening tools. Therefore, a thorough understanding of how to utilize these tools is also necessary and will be addressed in the educational resource.

Management Strategies

Management of delirium symptoms and causes can be addressed using multicomponent, interdisciplinary protocols including both pharmacologic (e.g., medication for pain management) and nonpharmacologic (e.g., x-rays) interventions (AGS, 2014; OH, n.d.; RNAO, 2016). Several resources suggested that this should include treating any underlying causes of delirium (e.g., urinary tract infection; AGS, 2014; Babb et al., 2021; OH, n.d.; RNAO, 2016). This often requires interdisciplinary collaboration for imaging, testing, or examinations to confirm underlying causes (RNAO, 2016). It was also noted that healthcare professionals should continue the previously outlined prevention strategies (e.g., sleep promotion) once delirium has been

confirmed (AGS, 2014; CCSMH, 2009; Moyle, 2020; RNAO, 2016). The rationale is that these strategies may help to address some of the underlying causes of delirium (e.g., proper bowel management may help to relieve constipation that is causing delirium).

While only one of the resources was a delirium management protocol (Babb et al., 2021), several resources highlighted the importance of utilizing management protocols within clinical settings (AGS, 2014; OH, n.d.; RNAO, 2016). The recently updated delirium protocol is comprehensive in terms of management of POD as it allows the medical team to check off appropriate consults, investigations, and nursing assessments from a pre-determined order set. The interventions are consistent with the findings from the other resources, as they focus on identifying underlying causes of delirium.

Education for Families and Caregivers

The importance of educating families and caregivers about delirium was highlighted in several resources (ANA, n.d.; Babb et al., 2021; CCSMH, 2009; OH, n.d.; RNAO, 2016). The OH (n.d.) resource outlined strategies for healthcare professionals to utilize when providing this education and information that should be included. They suggested explaining delirium with the use of plain language and several delivery methods (i.e., written, verbal, visual, and electronic). Handouts for families were noted within two resources which discussed delirium symptoms and how to care for the patient (Babb et al., 2021; CCSMH, 2009). Several techniques were noted including approaching the patient in a calm manner, bringing personal belongings into the hospital setting, and using simple directions. Similar strategies were outlined in the NSHA (n.d.) resource which also included a video outlining delirium behaviour. Within these resources, expectations were also outlined for families and caregivers in terms of treatment and recovery (Babb et al., 2021; CCSMH, 2009; NSHA, n.d.). These suggestions are in line with the findings

from the literature review as there was evidence to suggest that educating families about POD may help to improve identification and management of this condition (Bull et al., 2016; Wang et al., 2020).

Conclusion

The information retrieved through this environmental scan was deemed relevant to educating surgical nurses about the prevention, identification, and management of POD. The lack of responses from health facility representatives may suggest that there are limited resources available within Atlantic Canada. The websites were valuable sources of data and will help to guide the resource and generate ideas.

Overall, the findings from the resources were consistent with what was noted from a review of current literature on POD. The results gathered from this environmental scan will be utilized to develop a comprehensive learning resource. The development of the learning resource for this practicum project must include a more thorough overview of POD than what was noted within the resources analyzed for this environmental scan. The POD information will encompass signs and symptoms, causes, risk factors, and outcomes. Postoperative delirium prevention and management strategies will be outlined with rationale for practical use within the clinical setting. Education regarding the importance and utilization of validated screening tools within practice will also be noted. The education materials for families and caregivers will be utilized to inform surgical nurses on how to educate this population about POD. This environmental scan was successful as it will help to improve the overall quality and comprehensiveness of the final learning resource.

There was no single comprehensive resource noted that met all the components outlined in Table 2. As well, none of the resources were consistent with the educational interventions

deemed effective for POD in the literature (e.g., in-person lectures, self-learning modules, workshops, or group discussions; Sockalingham, 2014; Yanamadala, 2013). At present, there was no resource noted that adequately meets the needs of the staff nurses working in this surgery program. These findings combined with what was noted within the literature, validate the need for a learning resource on POD for surgical nurses working in acute care settings and will be used to inform the consultation interviews with key stakeholders.

References

American Geriatrics Society (2014, October 10th). *Clinical practice guideline for postoperative delirium in older adults*. https://www.archcare.org/sites/default/files/pdf/ags-2014-clinical-practice-guideline-for-postop-delirium-in-older-adults.pdf

American Nurses Association (n.d.). *Delirium: Prevent, identify, treat.* https://www.nursingworld.org/practice-policy/work-environment/health-safety/delirium/

Babb, K., Downey, J., & Coffey-Hickey, T. (2021, June 29). *Delirium screening and management (Adult acute care).* [Policy]. Eastern Health.

Bull, M. J., Boaz, L., Maadooliat, M., Hagle, M. E., Gettrust, L., Greene, M. T., Holmes, S. B., & Saczynski, J. S. (2016). Preparing family caregivers to recognize delirium symptoms in older adults after elective hip or knee arthroplasty. *Journal of the American Geriatrics Society, 65,* 13-17. https://doi.org/10.1111/jgs.14535

Canadian Coalition for Seniors' Mental Health (2009). *Delirium in older adults: A guide for seniors and their families*. https://ccsmh.ca/wpcontent/uploads/2016/03/ccsmh_delirium Booklet.pdf

Choi, J., Kim, K., Kang, M., Lee, Y., Koo, K., Oh, J. H., Park, Y. H., Suh, J., Kim, N., Yoo, H., Koo, J., Moon, H. M., Kim, E. H., Park, K., & Kim, C. (2019). Impact of a delirium prevention project among older hospitalized patients who underwent orthopedic surgery: A retrospective cohort study. *BMC Geriatrics, 19*(1). https://doi/org/ 10.1186/s12877-019-1303-z

Chen, C. C., Li, H., Liang, J., Lai, I., Purnomo, J. D. T., Yang, Y., Lin, B., Huang, J., Yang, C., Tien, Y., Chen, C., Lin, M., Huang, G., & Inouye, S. (2017). Effect of a modified hospital elder life program on delirium and length of hospital stay in patients undergoing

abdominal surgery: A cluster randomized clinical trial. *JAMA Surgery*, *152*(9), 827-834. https://doi.org/10.1001/jamasurg.2017.1083

Guo, Y. & Fan, Y. (2016). A preoperative, nurse-led intervention program reduces acute postoperative delirium. *Journal of Neuroscience Nursing*, *48*(4), 229-235. https://foi.org/10.1097/JNN.0000000000000220

Guo, Y., Sun, L., Li, L., Jia, P., Zhang, J., Jiang, H., & Jiang, W. (2016). Impact of multicomponent, nonpharmacologic interventions on perioperative cortisol and melatonin levels and postoperative delirium in elderly oral cancer patients. *Archives of Gerontology and Geriatrics, 62,* 112-117. https://doi.org/10.1016/j.archger.2015.10.009

Inouye, S. K., Westendorp, R. G. J., & Saczynski, J. S. (2014). Delirium in elderly people. *Lancet, 383*, 911-922. https://doi.org/ 10.1016/S0140-6736(13)60688-1

Kratz, T., Heinrich, M., Schlaub, E., & Diefenbacher, A. (2015). Preventing postoperative delirium: A prospective intervention with psychogeriatric liaison on surgical wards in a general hospital. *Deusches Artzeblatt International, 112*, 289-296. https://doi.org/10.3238/arztebl.2015.0289

Meako, M. E., Thompson, H. J., & Cochrane, B. B. (2011). Orthopaedic nurses' knowledge of delirium in older hospitalized patients. *Orthopaedic Nursing, 30*(4), 241-248. https://doi.org/10.1097/NOR.0b013e3182247c2b

Moyle, S. (2020). *What is delirium?* Ausmed. https://www.ausmed.com/cpd/articles/postoperative-delirium

Nova Scotia Health Authority (n.d.). *This is not my mom: Information and resources about delirium.* https://www.thisisnotmymom.ca/

Oberai, T., Killington, M., Laver, K., Crotty, M., & Jaarsma, R. (2019). "Just another piece of

paperwork": Perceptions of clinicians on delirium screening following hip fracture repair elicited in focus groups. *International Psychogeriatric, 31*(6), 877-884. https://doi.org/10.1017/S1041610218001369

Ontario Health (n.d.). *Quality standards: Delirium care for adults.* https://hqontario.ca/Portals/0/documents/ evidence/quality-standards/qs-delirium-quality-standard-en.pdf

Price, C. (n.d.) *PACU: Part 4 common complications*. [PDF]. Labrador-Grenfell Health.

Registered Nurses' Association of Ontario (2016, July). *Delirium, dementia, and depression in older adults: Assessment and care.* https://rnao.ca/sites/rnao ca/files/3Ds_BPG_WEB_FINAL.pdf

Schenning, K. J. & Deiner, S. G. (2015). Postoperative delirium in the geriatric patient. *Anesthesiology Clinics, 33*(3), 505-516. https://doi.org/10.1016/j.anclin.2015.05.007

Sockalingham, S., Tan, A., Hawa, R., Pollex, H., Abbey, S., & Hodges, B. D. (2014). Interprofessional education for delirium care: A systematic review. *Journal of Interprofessional Care, 28*(4), 345-351. https://doi.org/10.3109/13561820.2014.891979

Statistics Canada (2020a, September 29). *Analysis: Population by age and sex.* https://www150.statcan.gc.ca/n1/pub/91-215-x/2020001/sec2-eng.htm

Statistics Canada (2020b, September 17). *Population projections for Canada (2018 to 2068), provinces and territories (2018 to 2043).* https://www150.statcan.gc.ca/n1/pub/91-520-x/2019001/sect03-eng.htm

Thomas, N., Coleman, M., & Terry, D. (2021). Nurses/ experiences of caring for patients with delirium: Systematic review and qualitative evidence synthesis. *Nursing Reports, 11*(1), 164-174. https://doi.org/10.3390/nursrep11010016

van Velthuijsen, E. L., Zwakhalen, S. M. G., Warnier, R. M. J., Mulder, W. J., Verhey, F. R. J., & Kempen, G. I. J. M. (2016). Psychometric properties and feasibility of instruments for the detection of delirium in older hospitalized patients: A systematic review. *International Journal of Geriatric Psychiatry, 31*(9), 974-989.

Wang, Y., Yue, J., Xie, D., Carter, P., Li, Q., Gartganis, S. L., Chen, J., & Inouye, S. K. (2020). Effect of the tailored, family-involved hospital elder life program on postoperative delirium and function in older adults: A randomized clinical trial. *JAMA Internal Medicine, 180*(1), 17-25. https://doi.org/10.1001/jamainternmed.2019.4446

Yanamadala, M., Wieland, D., & Heflin, M. T. (2013). Educational interventions to improve recognition of delirium: A systematic review. *Journal of the American Geriatrics Society, 61*(11), 1983-1993. https://doi.org/10.1111/jgs.12522

Zhang, W., Sun, Y., Liu, Y., Qiu, W., Ye, X., Zhang, G., & Zhang, L. (2017). A nursing protocol targeting risk factors for reducing postoperative delirium in patients following coronary artery bypass grafting: Results of a prospective before-after study. *International Journal of Nursing Sciences, 4*(2), 81-87. https://doi.org/10.1016/j.ijnss.2017.02.002

Appendix A: Email for Health Facility Representatives

Hello,

My name is Vanessa Foley, and I am a Registered Nurse working on an in-patient orthopedic unit at **xxx** in **xxx.** I was wondering if you would be able to share any educational material, policies, or protocols related to postoperative delirium that are used within the surgery program at your facility. I am also a Master of Nursing student at Memorial University of Newfoundland. I am currently working on my practicum project which is focused on the nursing care of patients experiencing postoperative delirium. In consultation with my manager, nurse educator, and colleagues it was determined that a learning resource for staff nurses caring for this patient population would be of value to my unit. The goal of this practicum project is to develop a resource on the prevention, identification, and management of postoperative delirium for nurses working in acute surgical settings.

Currently, I am conducting an environmental scan to determine what resources exist within other health authorities across Atlantic Canada. Any materials that are used for educating staff nurses or are applied within their practice would be valuable. I will be reviewing all materials that I receive from various hospitals, analyzing them for commonalities, and using this information to help inform the development of my learning resource. I will only be sharing this information with my practicum supervisor and if we want to use any of your material within the resource, then I will reach out to you again to seek written permission.

Any assistance you can provide regarding relevant material utilized in your facility would be greatly appreciated. I am very thankful for your time taken to read and address this email. I appreciate hearing from you by June 1st about whether you will be able to share any of your materials. Please feel free to email me at any time to discuss any questions or concerns you may have.

Thank you,

Vanessa Foley BNRN
Master of Nursing Student
xxx
St. John's, NL
xxx

Appendix B: List of Health Facilities Contacted

1. James Paton Memorial Regional Hospital, Gander, NL – Central Health
2. Western Memorial Regional Hospital, Corner Brook, NL – Western Health
3. Dr. Charles S. Curtis Memorial Hospital, St. Anthony, NL – Labrador-Grenfell Health
4. Dr. Everett Chalmers Regional Hospital, Fredericton, NB – Horizon Health Network
5. The Moncton Hospital, Moncton, NB – Horizon Health Network
6. Saint John Regional Hospital, Saint John, NB – Horizon Health Network
7. QEII Halifax Infirmary, Halifax, NS – NS Health Authority
8. Cape Breton Regional Hospital, Sydney, NS – NS Health Authority
9. Queen Elizabeth Hospital, Charlottetown, PEI – Health PEI

Appendix C: Health Research Ethics Authority (HREA) Screening Tool

Student Name: Vanessa Foley

Title of Practicum Project: Development of a resource on the prevention, identification, and management of postoperative delirium for nurses working in acute surgical settings.

Date Checklist Completed: May 28th, 2021

This project is exempt from Health Research Ethics Board approval because it matches item number 3 from the list below.

1. Research that relies exclusively on publicly available information when the information is legally accessible to the public and appropriately protected by law; or the information is publicly accessible and there is no reasonable expectation of privacy.
2. Research involving naturalistic observation in public places (where it does not involve any intervention staged by the researcher, or direct interaction with the individual or groups; individuals or groups targeted for observation have no reasonable expectation of privacy; and any dissemination of research results does not allow identification of specific individuals).
3. **Quality assurance and quality improvement studies, program evaluation activities, performance reviews, and testing within normal educational requirements if there is no research question involved (used exclusively for assessment, management or improvement purposes).**
4. Research based on review of published/publicly reported literature.
5. Research exclusively involving secondary use of anonymous information or anonymous human biological materials, so long as the process of data linkage or recording or dissemination of results does not generate identifiable information.
6. Research based solely on the researcher's personal reflections and self-observation (e.g. auto-ethnography).
7. Case reports.
8. Creative practice activities (where an artist makes or interprets a work or works of art).

For more information, please visit the Health Research Ethics Authority (HREA) at https://rpresources.mun.ca/triage/is-your-project-exempt-from-review/

Appendix III: Consultation Report

Consultation report: Development of a resource on postoperative delirium for nurses working in acute surgical settings

Vanessa Foley

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Memorial University of Newfoundland

Postoperative delirium (POD) presents as a fluctuating, sudden change in cognition that frequently occurs in elderly patients after surgical intervention (Inouye et al., 2014; Schenning & Deiner, 2015). Caring for patients with POD presents many challenges within the acute care setting, such as increased workload, safety concerns, and delays in recovery (Guo et al., 2021; Thomas et al., 2021). There is also a significant risk of mortality for patients who have experienced POD (Bai et al., 2020; Inouye et al., 2014).

This practicum project is directed towards the development of an educational resource regarding the prevention, identification, and management of POD for nurses working in acute surgical settings. The need for this learning resource was determined through a literature review in which there was strong evidence to indicate that educational interventions for healthcare professionals may be effective in improving knowledge scores and reducing rates of POD (Choi et al., 2019; Guo & Fan, 2016; Sockalingham et al., 2014; Yanamadala et al., 2013). An environmental scan also determined that there is no singular comprehensive learning resource on POD available within the setting of this practicum project. The purpose of this consultation report is to determine key stakeholders' learning needs and preferred educational strategies to inform the development of the resource. This will help to create a learning resource that is both comprehensive and beneficial for surgical nurses.

Brief Overview of the Project

The setting for the practicum project is an orthopedic unit from a large city hospital in an Atlantic Canadian province. In 2016, an organizational directive was implemented that ensured all patients sustaining hip fractures within the health authority would be transferred to this orthopedic unit for surgical fixation. The unit now cares for an older adult population that often faces complex health and social issues. Postoperative delirium is a frequent complication seen on

the unit in elderly patients after surgical intervention.

When patients on the unit are identified as experiencing POD, the medical team orders an organizational delirium protocol and may also consult the ACE (i.e., acute care of the elderly) team. The preoperative and postoperative order sets were created in consideration of a geriatric patient population, though there are presently no specific protocols in place for the prevention of POD. There are also no educational materials available on the unit or consistently utilized in orientation for new nursing staff. This may contribute to a knowledge gap within the nursing staff and negatively impact patient outcomes. Several recent studies have noted that many nurses caring for patients with POD have a knowledge deficit and feel they are lacking the proper education to deliver quality care (Meako et al., 2011; Oberai et al., 2019; Thomas et al., 2021).

A review of recent literature also revealed a strong body of evidence to suggest that educational interventions related to POD are effective in improving both nurses' knowledge scores and reduction in POD rates (Choi et al., 2019; Guo & Fan, 2016; Sockalingham et al., 2014; Yanamadala et al., 2013). These findings were consistent with the practice recommendations and educational information presented in the resources that were analyzed in the environmental scan. Both the literature review and environmental scan have helped to guide the development of the practicum project, which will be an educational resource for surgical nurses on the prevention, identification, and management of POD. Integral to the development of this resource are the opinions and experiences of key stakeholders, including staff nurses, the patient care facilitator, the clinical educator, and a geriatrician from the ACE team. Interviews guided by recent literature regarding POD were conducted with these key informants. Data retrieved from the interviews will help to guide the development, content, and delivery method of the learning resource.

Specific Objectives for the Consultations

The objectives of the consultation plan are to:

1. Explore key stakeholders' experiences, attitudes, and comfort level with caring for patients with POD;
2. Identify any knowledge gaps or learning needs related to POD that need to be addressed in the resource;
3. Identify nurses' preferred delivery method, content, and educational strategies for the learning resource; and
4. Gather information from experts (e.g., geriatrician) about best practices that can serve to inform the content of the resource.

Methods

Setting and Sample

The setting for the consultations was an orthopedic unit at a large city hospital in an Atlantic Canadian province. Eight healthcare professionals were interviewed regarding their experiences caring for patients with POD. This included six nurses working on the unit, a patient care facilitator, and a clinical educator. Each of these healthcare professionals were approached via email to request their participation. See Appendix A for a copy of this email. A geriatrician was also emailed for an interview, but no response was received during the consultation period.

Of the six staff nurses, three were novice nurses (i.e., two years of experience or less) and three were experienced nurses (i.e., five or more years of experience). This was to try to meet the learning needs of both novice and experienced nurses in the development of the resource. The patient care facilitator was chosen as their role is to oversee the general flow of patient care on the unit. They are a resource for the staff nurses and are knowledgeable about occurrences

related to POD (e.g., patient falls or staff injuries). The clinical educator was consulted for their expertise on the learning needs of staff nurses within the surgical program and effective teaching strategies.

Data Collection

Once the participants agreed to be involved in the consultation process, interview appointments were arranged based on their availability and preferred data collection method (i.e., in-person or by phone). Each of the interviews was conducted over the phone, to accommodate participants' preferences. Data collection consisted of semi-structured interviews guided by the literature. These interviews utilized open-ended questions to guide the direction of the interview while still allowing the participants to elaborate on their opinions and experiences (Streubert & Carpenter, 2011). See Appendices B, C, D, and E for interview questions designed for the novice nurses, experienced nurses, patient care facilitator, and clinical educator.

Interviews lasted approximately 30 minutes and were completed once the participant felt they had no new information to discuss (Streubert & Carpenter, 2011). Detailed handwritten notes were taken during each interview, with further details added immediately after the interview ended to ensure all points were noted. Objective data collection requires that the interviewer set aside any previous opinions or assumptions about the issue prior to conducting interviews, as to prevent any personal bias (Streubert & Carpenter, 2011). To achieve this, I first acknowledged my personal opinions regarding caring for patients with POD and actively separated these ideas from the data collection process. This helped to gain a more objective understanding of the key stakeholders' experiences.

Data Management and Analysis

Data collected from the consultation interviews were appropriately managed and

analyzed to help inform the development of the educational resource. Handwritten notes taken during the interviews were typed out on my personal laptop, which is password-protected and not accessible to anyone other than myself. These notes were only available to be shared with the practicum supervisor. Content analysis was used to analyze the interviews to extract any recurring themes noted throughout the data (Streubert & Carpenter, 2011). The interview notes were read several times to ensure that all themes were noted and then discussed in relation to the objectives of this consultation plan. The findings from this consultation plan were then compared with those from the integrative literature review and the environmental scan to ensure the development of a comprehensive learning resource.

Ethical Considerations

To determine if the practicum project required ethical review by the Health Research Ethics Authority (HREA), the HREA screening tool was completed. As the project is focused on quality improvement, it was determined that a HREA review was not required. A completed copy of this screening tool can be found in Appendix F.

Agreement to participate was obtained from email replies seeking to arrange an interview and confirmed over the phone prior to beginning each interview. Participants were assured that their involvement in the interview was voluntary. They were also informed about the purpose of the interview and instructed that they could stop the interview at any time or refuse to answer any questions. Confidentiality was ensured, as names and identifiers were not recorded. Rather, a numeric code was assigned to each participant and utilized when managing the data. The clinical educator and patient care facilitator will be referred to as consultants when reporting the data as to distinguish them from the staff nurses, while still maintaining confidentiality. All data collected from the interviews were safely stored on a password protected laptop and viewed only

by myself and the practicum supervisor. Once the notes were typed onto the laptop, the paper copies were shredded and disposed of. After the completion of the practicum project, all typed notes will be permanently erased from the hard drive of the laptop.

Results

Eight of the nine key stakeholders who were invited to participate in the consultation interviews agreed to participate. The geriatrician was unable to be reached during the time of the consultation process. Interviews were conducted over the phone from July 20th to July 29th, 2021. As previously noted, all data obtained through the consultation interviews were analyzed to determine any recurring concepts or ideas. Three themes titled issues, resource content, and delivery method were identified. Limited education, confidence, workplace stress, and organizational issues were all concepts connected to the theme of issues. Resource content consisted of concepts titled prevention, early identification, management, stress management, and family involvement. Finally, the delivery method theme outlined the participants' preferences for the learning resource.

Issues

The novice and experienced nurses were asked about their personal experiences caring for patients with POD on the unit. Similarly, the consultants were questioned about the impact of POD within the surgery program based on their opinions and experiences. Lack of education, confidence, workplace stress, and organizational challenges were concepts identified in these discussions that result in issues related to POD.

Limited Education

Discussions with the novice and experienced nurses suggested that there is inconsistency in the orientation process for both recent graduates and nurses new to the unit. Two novice

nurses and two experienced nurses could not recall any information related to POD being covered in their orientation to the unit. One novice nurse stated that she completed a module about delirium during her orientation but that it was not mandatory. Similarly, one of the experienced nurses recalled delirium being discussed in their orientation, but not in detail. These findings were consistent with another consultant's observation that POD is not routinely or extensively covered within orientation to the surgery program.

The nursing staff explained that outside of their orientation, there was also limited ongoing education on the topic of POD. Several nurses noted that their knowledge on the topic came mostly from work experience rather than formal education. In terms of educational opportunities, one experienced nurse recalled completing an optional module while another explained that they once sought out a learning module from outside the organization as they were interested in learning more about delirium. A consultant stated that POD was a topic covered in an optional education day a few years ago, though none of the staff nurses recalled this learning opportunity. Another consultant noted that there was a PowerPoint slide deck made available to staff covering the changes made to the updated delirium management protocol that was released on June 29th, 2021. When asked about this, each nurse indicated that they either had not viewed the PowerPoint slide deck or were not aware of its existence.

The consensus of the novice and experienced nurses was that there has not been a singular comprehensive learning resource that has addressed their learning needs. Each of the nurses expressed that there was not enough education available considering how substantial the issue of POD is on the unit. It was explained that a new learning resource could be effectively used for orientation for nurses that are new to the unit and especially those that have just recently graduated. Two of the experienced nurses also indicated that this resource would be beneficial as

a “refresher” for current staff on the unit.

Confidence

When asked about their comfort with caring for patients with POD, the nurses stated that they were mostly confident. Each of the six nurses explained that they became comfortable caring for this patient population because they had been exposed to POD so often on the unit. For some of these nurses (n = 3), their exposure to POD first occurred when they transferred to this unit from other practice areas. Despite feeling confident providing care to this patient population, each of the nurses acknowledged that there were still situations in which they consulted one another to determine the best course of action in challenging circumstances.

One of the novice nurses indicated that they were initially overwhelmed when they transferred to this unit from another practice area. They also noted that they had “quickly” become comfortable with caring for patients with POD due to the frequency of cases on the unit. This phenomenon of feeling overwhelmed and quickly learning through experience was also noted by each of the more senior nurses (n = 3). They explained that they often received questions related to POD (e.g., whether the medical team should be contacted) from new graduates, and then observed these nurses quickly becoming more comfortable dealing with these issues. One consultant also expressed that they typically received questions from more novice nurses, though there were still situations where experienced staff would ask about the use of restraints or constant observation for patients.

Workplace Stress

The nursing staff was asked about the challenges of caring for patients with POD and any associated stress and frustration they experienced. All six of the nurses agreed that caring for this patient population within an acute care setting was extremely challenging and stressful. They

described a unit that was already hectic with high acuity which became more difficult to manage when caring for patients with POD. One experienced nurse described the busy unit as a "rat race" while another noted the challenges of reorienting these patients and reasoning with them to allow nursing care. Each of the nurses described the stress related to maintaining patient safety by utilizing close observation, bed alarms, and physical or chemical restraints, as these patients were often impulsive and trying to ambulate independently or leave the unit. Two nurses explained that many of their shifts were spent "running down the hallways" to attend to patients who had set off their bed alarms or were screaming for help. One consultant agreed that "you need eyes on the back of your head" as these patients are often impulsive and require a higher level of care.

Several nurses also noted that over time this stress had negatively impacted themselves and other staff members. Four nurses described their dissatisfaction with the physical abuse they often experienced from patients who were scared or agitated due to POD. This was echoed by a consultant who noted that the nursing staff has often voiced their concerns with physical abuse and that there had been situations where staff were injured. One novice nurse noted that they had cried on the unit out of frustration when dealing with a challenging situation related to POD. It was explained by both novice and experienced nurses that these issues related to workplace stress had resulted in burnout for most of the nursing staff. They also noted that there were high rates of staff turnover and one experienced nurse expressed they felt this was in part related to frequently caring for patients with POD.

Organizational Challenges

Each of the participants acknowledged that there were organizational challenges related to caring for patients with POD in an acute surgical setting. Staffing issues were of the greatest

concern and were noted by each of the participants as contributing to the overall issue of caring for this patient population. The staff nurses explained that nurse-patient ratios were not always conducive to quality care and that constant observation was often impossible due to a lack of available staff. In particular, the nurses (n = 3) noted that night shifts were especially challenging due to having less nursing staff available. Burnout was noted to have contributed to increased sick leave which further impacted staffing concerns when there were no staff members available to replace these sick calls.

It was noted by two experienced nurses that patients who experienced POD sometimes had long term cognitive changes and required a higher level of care (e.g., long term care) after their surgical recovery. The wait time for transferring patients to long term care facilities or preparing them for rehabilitation could take months with patients then left in acute care during this time. The nurses explained that these patients would often experienced ongoing periods of delirium. This was acknowledged by a consultant who noted discharge delays were a substantial issue and that the wait for long term care further complicated the recovery process for these patients.

Resource Content

The novice and experienced nurses were asked several questions about the prevention, identification, and management of POD, as well as their experiences with stress management and educating families. The consultants were questioned about these topics in relation to their respective roles. Through each of these discussions, there were recurring ideas that were either mentioned by participants as personal learning needs, suggested topics for the learning resource, or noted through content analysis to be possible knowledge gaps. These ideas will be utilized as content for the learning resource and an overview is noted below in Table 1.

Table 1

Resource Content

Learning Needs, Suggested Topics, and Knowledge Gaps
• Risk factors for POD • Checklist to identify high-risk patients • Medications to use or avoid with elderly patients • Prevention strategies (i.e., education and practical use) • Symptoms of POD • Identifying POD in patients with baseline cognitive issues (e.g., dementia) • Proper use of the Confusion Assessment Method • Communication strategies (i.e., between nursing staff, with physicians, and with families) • Rationale for POD management interventions • De-escalation with agitated patients • Restraints (i.e., how to avoid and when to use) • Stress management and self-care • Family education

Prevention of Postoperative Delirium

The nursing staff were able to note several risk factors for POD including advanced age (n = 6), pain (n =6), medications (n = 3), change in environment (n =3), urinary tract infections (n = 3), and poor nutrition (n = 1). The nurses noted that when they observed these risk factors within their patients that they strived to lower the patients' risk whenever possible (e.g., medicating for pain as needed). However, it was noted by four nurses that further education related to risk factors was desired. One novice nurse suggested that a checklist to help identify high-risk patients would be helpful. The other nurses suggested that they wanted to learn more about medications that should be avoided in elderly patients due to the risk of delirium.

When discussing prevention strategies they were familiar with or utilized in their practice, the nursing staff mentioned pain control (n = 6), early mobility (n = 3), avoidance of indwelling catheters (n = 3), use of private rooms (n = 2), medication review (n = 2), sleep promotion (n = 1) and adequate nutrition and hydration (n = 1). During these discussions, the nurses acknowledged that these strategies are not always effectively utilized due to the busy nature of the unit or staff's lack of knowledge on these topics. Pain control was noted to be of concern, as the nurses each explained that it was important to use the lowest possible doses of narcotics while still aiming to control pain, as to prevent POD. They acknowledged that while they strived for this ideal, it was not always achieved on the unit. Similarly, early mobility was deemed important though nurses (n = 3) recognized there were situations where bedpans were used instead of commodes or toilets when the unit was particularly hectic, and patients were not motivated to ambulate.

There were several prevention strategies outlined in the literature review and environmental scan that were not noted by any of the nursing staff including orientation techniques, sensory assistance, bowel management, and adequate oxygenation. This may suggest a knowledge gap, as participants were prompted to discuss all prevention strategies they were familiar with and utilized within their practice. This is consistent with one consultant's observation that prevention is an area in which there needs to be further education and consistency. The nurses were prompted about several prevention strategies, though due to time constraints the participants were not asked about each individual prevention strategy. Overall, the participants acknowledged that while they utilized some prevention strategies within their practice, that this was an area in which they desired further education. The nurses wanted to have a greater understanding of how they could implement the interventions practically on the unit.

Early Identification of Postoperative Delirium

The novice and senior nurses were asked about their experiences with identifying symptoms of POD. They stated that generally they were comfortable with recognizing symptoms such as agitation, disorientation, and aggression that are all associated with hyperactive delirium. It was noted that only one novice nurse and one experienced nurse discussed symptoms related to hypoactive delirium, including drowsiness. The same novice nurse also noted that they would like to learn more about early symptoms of POD. Each of the nurses noted how it can be challenging to differentiate POD from early forms of dementia or detect cases of POD that is superimposed on dementia. They acknowledged that this was an area in which they desired further education.

All six of the nurses noted that knowing the patient's baseline cognition is essential when assessing for POD. They explained that this is often achieved through communication with the patient's family. Four nurses acknowledged that this communication could improve, as well as properly handing over this information to oncoming nursing staff. Each of the nurses identified that early identification of POD was important to begin proper management but stated there were sometimes delays in this process. Two nurses explained how symptoms of POD could easily be missed without frequent assessments.

The nurses were also asked about the confusion assessment method (CAM) screening tool which is utilized within the organization to assess for cognitive changes. Generally, the nurses (n = 5) felt comfortable using the CAM but stated there were several concerns with this tool. They noted it to be time consuming (n = 3), complicated (n = 2), and impractical (n=1). Three nurses also discussed how the tool was challenging to use with patients who also had dementia or were nonverbal. While they stated they were comfortable with the CAM, four nurses

also noted that they were not sure if they were correctly utilizing the tool. One experienced nurse stated, “I do it, but I don’t know if I’m always doing it right”. These concerns were echoed by one consultant who stated that the questions they most often received related to POD were about how to correctly use the CAM. Another consultant also noted that the CAM is not always well understood or feasible. These findings suggest that this is a topic where further education is required.

Management of Postoperative Delirium

Each of the nurses discussed how POD is typically managed on the unit, beginning with notifying the medical team about their concerns. Each of the nurses stated that they were comfortable communicating this information, but four nurses noted that it can be challenging to get the medical team to act on this. They noted that there are often delays in care for this reason. However, it was also stated by three nurses and one consultant that this issue has been improving.

It was explained that the physicians typically order a delirium protocol consisting of medications, medical tests, and nursing interventions. At times, they also consult the geriatric medical team for further assistance. When asked about the updated delirium protocol that was released on June 29th, 2021, two experienced nurses noted that they had utilized the protocol and were happy with the changes. The four other nurses explained that they had not yet utilized the protocol. In terms of the new protocol, two experienced nurses and two novice nurses explained that they would like further education about the rationale behind the nursing interventions and medications to use or avoid when caring for this patient population.

The nurses then described how underlying causes of POD (e.g., urinary tract infections) were sometimes discovered when using the delirium protocol. In other cases, no underlying

cause was discovered, and they had to let the POD “run its course”. The nurses discussed how during the management phase of POD, there were often concerns with patient and staff safety. This was typically due to agitated or aggressive behaviour displayed by patients during this time. Several nurses expressed an interest in education regarding de-escalation techniques as to maintain patient and staff safety. Three nurses also discussed how physical and chemical restraints were sometimes necessary in these situations. They acknowledged that this was not the first course of action but that it was essential in some cases when de-escalation and reorientation techniques were not effective. One novice nurse indicated that they desired further education about steps to take to avoid the use of restraints when caring for patients with POD.

Stress Management

As previously noted, workplace stress was an issue of great concern for the novice and experienced nurses. However, several nurses were able to identify self-care measures they utilized to manage this stress. Exercise (n = 3), spending time with loved ones (n = 2), and mindfulness activities (n = 1) were some of the strategies that the nurses used outside of the workplace to control stress. One novice nurse also noted that they were working in a casual position and would sometimes choose not to accept a shift on the day after a particularly challenging shift. One experienced nurse discussed some self-care measures they utilized in the workplace such as ensuring they take breaks off the unit and going for a walk outside when possible. However, it was noted by two nurses that learning about coping and self-care through the educational resource would be beneficial for their practice. Specifically, they were interested in ways they could manage stress while at work and help them relax in frustrating situations. This would likely be helpful for many of the nurses as most of the stress management techniques that were noted were utilized outside of the workplace.

Family Involvement

The importance of involving family members in patient care was acknowledged by each of the participants. The novice and experienced nurses explained that families were typically able to provide information about the patients' baseline cognition and were often the first to notice that "something wasn't right". Two novice nurses and new experienced nurses described how families were often not educated about POD prior to the onset of the complication and were "blindsided" or "confused" about the patient's behaviour. One novice nurse and one experienced nurse explained how family members would sometimes blame the nursing staff or the organization at large for the patient's cognitive changes, due to a lack of education. A consultant noted that there were times family members sought to speak with them regarding concerns related to the patients' POD. It was noted by one experienced nurse that educating families about POD can help to alleviate their stress.

The nurses each explained their process for educating family members about POD which typically included discussing expected behaviours, the delirium protocol, and the temporary nature of POD. Only one novice nurse explained that they try to provide this education prior to the patient's surgery or change in cognition. The other five nurses explained that they provided this education once symptoms of POD were noted, though they acknowledged it would be more effective if the education was completed on admission. It was suggested that this should be a joint effort with the medical team. One consultant also discussed how education on admission would be a more effective strategy. They noted that the allied health team often presents a booklet to patients covering several topics, including POD. However, they also stated that this is often delayed and not completed prior to surgery or the onset of POD symptoms.

Overall, the participants explained that openly communicating with families and

providing POD education was beneficial for reducing their stress and improving their involvement in the patient's care. The nurses noted how family members often alleviated the need for constant observation staff and were able to bring comfort to patients. One experienced nurse noted how previously agitated patients often became more relaxed when their family member was present. It was noted by four nurses that further education about how to properly educate families would be beneficial for the unit.

Delivery Method

There was division noted amongst the participants when asked about what delivery method for the educational resource would be most effective for their personal learning needs. One novice nurse and one experienced nurse expressed their preference for in-person presentations that also included informal group discussions. They explained that they were often less motivated to complete self-learning modules and thus, found in-person lectures to be more effective. Several nurses (n = 3) also stated that they did not always look to complete educational interventions unless they deemed them to be relevant for their practice. These concerns were echoed by a consultant who explained that staff are often less motivated to complete educational interventions that were not mandatory unless the intervention was addressing a substantial concern within the workplace. They also expressed that including staff within the development phase is crucial as it encourages participation in the delivery of the learning resource.

The remaining novice and experienced nurses explained that either in-person lectures or self-learning modules were effective for meeting their learning needs. However, two of these experienced nurses did state that self-learning modules were most effective if they utilized engaging strategies (e.g., videos or visual aids) and were able to be completed over time in small sections. They felt this was more conducive to their busy schedules, as they would be able to

complete the modules at their own pace. One consultant noted that self-learning modules are the new direction for educational interventions within the organization as this method can most easily accommodate learning needs. They expressed concern about in-person lectures and lunch-and-learn sessions, as staff are often too busy to attend or stay for the entirety of the session.

Conclusion

The data collected from these consultation interviews were extremely beneficial for the development of the learning resource. It was noted that there is currently limited education available for staff on the unit and no consistent education delivered during orientation. This was consistent with findings from the literature review which suggest that surgical nurses often lack continued education about POD (Thomas et al., 2021). The novice and experienced nurses identified various topics in which they desired further education and several knowledge gaps were also noted through data analysis. Many of these topics were also noted within the literature to be areas in which nurses were less confident or required further education, including symptoms of POD, risk factors, medications to avoid, use of the CAM, and identifying POD that is superimposed on dementia (Meako et al., 2011; Oberai et al., 2019; Thomas et al., 2021). Each of the topics outlined in Table 1 will be incorporated into the learning resource, as they have been discussed as learning needs of the key stakeholders or identified as knowledge gaps.

Based on the consultation interviews, it was noted that either an in-person lecture with group discussions or a self-learning module would be an effective delivery method for the learning resource. This was consistent with findings from the literature that indicate these are effective methods for delivering education to healthcare professionals about POD (Sockalingham et al., 2014; Yanamadala et al., 2013). An online, self-learning module will be developed considering the organizational shift towards this educational strategy and the current workplace

gathering restrictions related to the COVID-19 pandemic. In keeping with the participants' suggestions, this self-learning module will include engaging strategies (e.g., visual aids and videos) and be separated into smaller sections. The data collected from these consultation interviews have been extremely beneficial as they have allowed for a clearer understanding of the key stakeholders' learning needs. These findings will help to develop a comprehensive self-learning module that may help to improve staff knowledge and patient outcomes.

References

Bai, J., Liang, Y., Zhang, P., Liang, X., He, J., Wang, J., & Wang, Y. (2020). Association between postoperative delirium and mortality in elderly patients undergoing hip fractures surgery: A meta-analysis. *Osteoporosis International, 31*, 317-326. https://doi.org/10.1007/s00198-019-05172-7

Choi, J., Kim, K., Kang, M., Lee, Y., Koo, K., Oh, J. H., Park, Y. H., Suh, J., Kim, N., Yoo, H., Koo, J., Moon, H. M., Kim, E. H., Park, K., & Kim, C. (2019). Impact of a delirium prevention project among older hospitalized patients who underwent orthopedic surgery: A retrospective cohort study. *BMC Geriatrics, 19*(1). https://doi/org/ 10.1186/s12877-019-1303-z

Guo, Y. & Fan, Y. (2016). A preoperative, nurse-led intervention program reduces acute postoperative delirium. *Journal of Neuroscience Nursing, 48*(4), 229-235. https://foi.org/10.1097/JNN.0000000000000220

Guo, R. Y., Hshieh, T. T., Marcantonio, E. R., Cooper, Z., Jones, R. N., Travison, T. G., Fong, T. G., Abdeen, A., Lange, J., Earp, B., Schmitt, E. M., Leslie, D. L., & Inouye, S. K. (2021). One-year medicare costs associated with delirium in older patients undergoing major elective surgery. *JAMA Surgery, 156*(5), 462-470. https://doi.org/10.1001/jamasurg.2020.7260

Inouye, S. K., Westendorp, R., & G. J., Saczynski, J. S. (2014). Delirium in elderly people. *Lancet, 383*, 911-922. https://doi.org/ 10.1016/S0140-6736(13)60688-1

Meako, M. E., Thompson, H. J., & Cochrane, B. B. (2011). Orthopaedic nurses' knowledge of delirium in older hospitalized patients. *Orthopaedic Nursing, 30*(4), 241-248. https://doi.org/10.1097/NOR.0b013e3182247c2b

Oberai, T., Killington, M., Laver, K., Crotty, M., & Jaarsma, R. (2019). “Just another piece of paperwork”: Perceptions of clinicians on delirium screening following hip fracture repair elicited in focus groups. *International Psychogeriatric, 31*(6), 877-884. https://doi.org/10.1017/S1041610218001369

Schenning, K. J. & Deiner, S. G. (2015). Postoperative delirium in the geriatric patient. *Anesthesiology Clinics, 33*(3), 505-516. https://doi.org/10.1016/j.anclin.2015.05.007

Sockalingham, S., Tan, A., Hawa, R., Pollex, H., Abbey, S., & Hodges, B. D. (2014). Interprofessional education for delirium care: A systematic review. *Journal of Interprofessional Care, 28*(4), 345-351. https://doi.org/10.3109/13561820.2014.891979

Streubert, H. J. & Carpenter, D. R. (2011). *Qualitative research in nursing: Advancing the humanistic imperative.* (5th ed.) Philadelphia, PA: Lippincott Williams & Wilkins.

Thomas, N., Coleman, M., & Terry, D. (2021). Nurses’ experiences of caring for patients with delirium: Systematic review and qualitative evidence synthesis. *Nursing Reports, 11*(1), 164-174. https://doi.org/10.3390/nursrep11010016

Yanamadala, M., Wieland, D., & Heflin, M. T. (2013). Educational interventions to improve recognition of delirium: A systematic review. *Journal of the American Geriatrics Society, 61*(11), 1983-1993. https://doi.org/10.1111/jgs.12522

Appendix A: Email Request for Participation

Hello (name of participant),

I am writing you today to request your **participation in an interview** that will assist with the completion of my master's practicum project. I am an RN working on **xxx** and completing my Master of Nursing degree through Memorial University of Newfoundland and Labrador. For my final practicum project, I am developing a learning resource for surgical nurses caring for **patients experiencing postoperative delirium**. The goal is that nurses' learning needs will be addressed through this resource to improve both patient outcomes and nurses' confidence in caring for these patients.

Currently, I am looking to consult with nurses, physicians, and educators who have experience caring for this patient population and can help to inform the content and delivery of the learning resource. **I am requesting your participation in a short interview** in which you can share your experiences. This interview can take place either in-person or by phone and would last approximately 20-30 minutes.

Your participation in this interview is voluntary and any information you share would remain confidential. The data will be stored on my personal laptop which is password protected and will only be viewed by myself and my practicum supervisor. Once the practicum project is completed, data will permanently be deleted from the laptop. There are also no consequences or negative implications if you chose not to participate in this interview.

If you have any questions or would like to participate in this interview, **please contact me via email at xxx by July 23rd, 2021**. I am looking to **complete the interview by July 30th, 2021**. I feel your experience would be valuable in guiding the development of this learning resource and any assistance you can provide would be greatly appreciated.

Thank you in advance for your consideration,

Vanessa Foley BNRN
MUN Master of Nursing Student

Appendix B: Interview Questions for Novice Nurses

1. How many years have you been working as a nurse? How many years of experience do you have working in acute surgical settings?

2. The literature has suggested that nurses with less than 10 years of experience were not always comfortable with their knowledge on POD regarding medications to avoid, educating families, and identifying risk factors and symptoms.
   A. How comfortable are you in providing care to patients with POD?
   B. When you have questions or concerns related to the care of patients with POD, where do you seek information within the workplace? (e.g., from experienced nurses).

3. The literature has suggested that many nurses find caring for patients with POD challenging due to several issues, including increased workload, safety concerns, and uncertainties about how to best care for this patient population.
   A. Can you tell me about your experience caring for patients with POD?
   B. What do you feel are some challenges or barriers in providing quality care to these patients?
   C. Are there any changes in practice or organizational changes you would like to see that could improve the care of these patients?

4. The literature suggests that nurses often feel stress and frustration when caring for patients with POD.
   A. Do you ever receive any questions or concerns from other nursing staff related to caring for patients with POD? If so, can you please elaborate on this?
   B. Do you ever receive any questions or concerns from other members of the interdisciplinary team or administration? If so, can you please elaborate on this?
   C. Have you personally experienced stress or frustration caring for patients with POD? If so, can you please elaborate?
   D. Are there any self-care measures that you engage in to help manage work-related stress and frustration? If so, can you please describe this for me?

5. The literature has indicated that educating families about POD and including them in patient care may be beneficial for early identification and reduction of POD rates.
   A. Can you tell me about your experiences with the families of patients with POD?
   B. Do you include education for families within your care of patients with POD? If so, can you please elaborate on what this education includes and how your deliver it?
   C. Are there any ways you feel communication and education with these families could improve? If yes, can you please elaborate?

6. It has been noted within the literature that older age, general anesthesia, and poor postoperative pain control are risk factors for the development of POD.
   A. Are there any other risk factors you are familiar with and have noticed within your practice?
   B. Do you make any changes to your nursing practice when you recognize these risk factors within your postoperative patients?

7. Several prevention strategies have been noted in the literature to be effective in reducing rates of POD, including sleep promotion and early mobility.
   A. Can you describe any prevention strategies you use in your practice to try to prevent POD in high-risk patients?
   B. Are there any prevention strategies you feel are effectively being used on the unit?
   C. What are some ways you feel prevention strategies could be better incorporated into the postoperative care provided to patients on the unit?

8. Recent literature suggests that many nurses find it challenging to identify POD, especially if the patient has dementia or is exhibiting hypoactive symptoms, such as drowsiness. What is your comfort level when assessing and identifying patients with POD?

9. Frequent assessments and use of validated screening tools are recommended strategies within the literature for identifying POD. The CAM is the screening tool currently used within the organization to assess for cognitive changes related to delirium.

A. How comfortable are you with using this tool?
B. Do you have any concerns with using this tool within practice? (e.g., time consuming or challenging to use with patients).
C. Once you have identified that a patient is experiencing symptoms consistent with POD, how comfortable are you with communicating this information to the team?
D. Can you describe your experiences for how POD is then managed on the unit?

10. Literature suggests that management of POD should be focused on treating underlying causes, collaborating with the interdisciplinary team, and continuing the use of prevention strategies (e.g., sleep promotion).
    A. How comfortable are you in collaborating with members of the interdisciplinary team, such as physicians, physiotherapists, occupational therapists, and dieticians?
    B. Have you utilized the new delirium management protocol within practice? If yes, can you please describe your experience and your comfort level with following the policy?

11. Recent literature indicates that many nurses feel unprepared to care for patients with POD and desire effective education.
    A. Can you tell me about any education or training you have received about POD? Did you find this education beneficial for your nursing practice?
    B. Did you receive any education on POD during your orientation to this site or unit? If not, is this something you feel would have been beneficial and how can this issue be addressed?
    C. What are your learning needs related to providing care to patients with POD?

12. The literature suggests that in-person lectures, self-learning modules, workshops, group discussions, and interdisciplinary collaborations are all effective strategies for providing education to nurses about POD.
    A. What method do you feel would be most effective for the nursing staff on 6 West?
    B. What educational strategies have you noted to be successful on the unit in the past?
    C. What strategy do you feel would be best suited for your learning needs?

D. Are there any other educational strategies that you feel would be effective? (e.g., quizzes, videos, handouts, resource manual, etc.).
E. Is there any information related to POD that you feel I should include in the learning resource?

13. Is there anything else related to the care of patients with POD that you would like to discuss?

Appendix C: Interview Questions for Experienced Nurses

1. How many years have you been working as a nurse? How many years of experience do you have working in acute surgical settings?

2. The literature has suggested that nurses with less than 10 years of experience were not always comfortable with their knowledge on POD regarding medications to avoid, educating families, and identifying risk factors and symptoms.
   A. Have you had many novice nurses seek your guidance on how to best care for patients with POD? If yes, in what areas have they required assistance?
   B. How comfortable are you in providing care to patients with POD?
   C. When you have questions or concerns related to the care of patients with POD, where do you seek information within the workplace?

3. The literature has suggested that many nurses find caring for patients with POD challenging due to several issues including increased workload, safety concerns, and uncertainties about how to best care for this patient population.
   A. Can you tell me about your experience caring for patients with POD?
   B. What do you feel are some challenges or barriers in providing quality care to these patients?
   C. Are there any changes in practice or organizational changes you would like to see that could improve the care of these patients?

4. The literature suggests that nurses often feel stress and frustration when caring for patients with POD.
   A. Do you ever receive any questions or concerns from other nursing staff related to caring for patients with POD? If so, can you please elaborate on this?
   B. Do you ever receive any questions or concerns from other members of the interdisciplinary team or administration? If so, can you please elaborate on this?
   C. Have you personally experienced stress or frustration caring for patients with POD? If so, can you please elaborate?

D. Are there any self-care measures that you engage in to help manage work-related stress and frustration? If so, can you please describe this for me?

5. The literature has indicated that educating families about POD and including them in patient care may be beneficial for early identification and reduction of POD rates.
   A. Can you tell me about your experiences with the families of patients with POD?
   B. Do you include education for families within your care of patients with POD? If so, can you please elaborate on what this education includes and how your deliver it?
   C. Are there any ways you feel communication and education with these families could improve? If yes, can you please elaborate?

6. It has been noted within the literature that older age, general anesthesia, and poor postoperative pain control are risk factors for the development of POD.
   A. Are there any other risk factors you are familiar with and have noticed within your practice?
   B. Do you make any changes to your nursing practice when you recognize these risk factors within your postoperative patients?

7. Several prevention strategies have been noted in the literature to be effective in reducing rates of POD, including sleep promotion and early mobility.
   A. Can you describe any prevention strategies you use in your practice to try to prevent POD in high-risk patients?
   B. Are there any prevention strategies you feel are effectively being used on the unit?
   C. What are some ways you feel prevention strategies could be better incorporated into the postoperative care provided to patients on the unit?

8. Recent literature suggests that many nurses find it challenging to identify POD, especially if the patient has dementia or is exhibiting hypoactive symptoms, such as drowsiness. What is your comfort level when assessing and identifying patients with POD?

9. Frequent assessments and use of validated screening tools are recommended strategies within the literature for identifying POD. The CAM is the screening tool currently used within the organization to assess for cognitive changes related to delirium.
    A. How comfortable are you with using this tool?
    B. Do you have any concerns with using this tool within practice? (e.g., time consuming or challenging to use with patients).
    C. Once you have identified that a patient is experiencing symptoms consistent with POD, how comfortable are you with communicating this information to the team?
    D. Can you describe your experiences for how POD is then managed on the unit?

10. Literature suggests that POD management should be focused on treating underlying causes, collaborating with the interdisciplinary team, and continuing the use of prevention strategies (e.g., sleep promotion).
    A. How comfortable are you in collaborating with members of the interdisciplinary team, such as physicians, physiotherapists, occupational therapists, and dieticians?
    B. Have you utilized the new delirium management protocol within practice? If yes, can you please describe your experience and your comfort level with following the policy?

11. Recent literature indicates that many nurses feel unprepared to care for patients with POD and desire effective education.
    A. Can you tell me about any education or training you have received about POD? Did you find this education beneficial for your nursing practice?
    B. Did you receive any education on POD during your orientation to this site or unit? If not, is this something you feel would have been beneficial and how can this issue be addressed?
    C. What are your learning needs related to providing care to patients with POD?

12. The literature suggests that in-person lectures, self-learning modules, workshops, group discussions, and interdisciplinary collaborations are all effective strategies for providing education to nurses about POD.
    A. What method do you feel would be most effective for the nursing staff on 6 West?

B. What educational strategies have you noted to be successful on the unit in the past?
C. What strategy do you feel would be best suited for your learning needs?
D. Are there any other educational strategies that you feel would be effective? (e.g., quizzes, videos, handouts, resource manual, etc.).
E. Is there any information related to POD that you feel I should include in the learning resource?

13. Is there anything else related to the care of patients with POD that you would like to discuss?

Appendix D: Interview Questions for the Patient Care Facilitator

1. Based on your experiences and role within the care team, can you tell me about the impact of POD on the unit?

2. The literature had indicated that increased workload, lack of resources, and physical abuse are some of the challenges faced by nurses caring for patients with POD.
    A. What do you feel are some of the challenges or barriers in providing quality care to these patients?
    B. Have you noticed any concerning trends or issues related to the care of patients with POD on the unit?
    C. Are there any changes in practice or organizational changes you would like to see that could improve the care of these patient?

3. The literature suggests that nurses often feel stress and frustration when caring for patients with POD. Do you ever receive any questions or concerns from nursing staff, members of the interdisciplinary team, or administration about the care of patients with POD on the unit? If so, can you please elaborate on this.

4. The literature suggests that nurses have concerns about both staff and patient safety when caring for patients with POD. Can you tell me about any safety concerns on the unit related to POD? For example, are there incidents related to patient falls or staff injuries?

5. The literature has indicated that educating families about POD and including them in patient care may be beneficial for early identification and reduction of POD rates.
    A. Are there any ways you feel communication and education with these families could improve? If yes, can you please elaborate?
    B. Have there been instances where you have become involved in this education perhaps due to families' concerns or nurses seeking guidance?

6. Several prevention strategies have been noted in the literature to be effective in reducing rates of POD, including sleep promotion and early mobility.
    A. Are there any prevention strategies you feel are effectively being used on the unit?
    B. What are some ways you feel prevention strategies could be better incorporated into the postoperative care provided to patients on the unit?

7. Recent literature indicates that many nurses feel unprepared to care for patients with POD due to a lack of formal education on the topic. Areas of concern include prevention strategies, early identification, and their role in the management of POD.
    A. Do you feel there could be any improvements to the orientation process for nurses regarding POD?
    B. Are there any topics related to POD in which you feel the nursing staff may require further education?

8. The literature suggests that in-person lectures, self-learning modules, workshops, group discussions, and interdisciplinary collaborations are all effective strategies for providing education to nurses about POD.
    A. What method do you feel would be most effective for the nursing staff on 6 West?
    B. What educational strategies have you noted to be successful on the unit in the past?
    C. Are there any other educational strategies that you feel would be effective? (e.g., quizzes, videos, handouts, resource manual, etc.).
    D. Is there any information related to POD that you feel I should include or any recommendations you would like to make for the development of this learning resource?

9. Is there anything else related to the care of patients with POD that you would like to discuss?

Appendix E: Interview Questions for the Clinical Educator

1. Based on your experiences and role within the care team, can you tell me about the impact of POD within the surgery program?

2. The literature had indicated that increased workload, lack of resources, and physical abuse are some of the challenges faced by nurses caring for patients with POD.
   A. What do you feel are some of the challenges or barriers in providing quality care to these patients?
   B. Have you noticed any concerning trends or issues related to the care of patients with POD within the surgery program?
   C. Are there any changes in practice or organizational changes you would like to see that could improve the care of these patients?

3. The literature suggests that nurses often feel stress and frustration when caring for patients with POD. Do you ever receive any questions or concerns from nursing staff, members of the interdisciplinary team, or administration about the care of patients with POD within the surgery program? If so, can you please elaborate on this.

4. Recent literature indicates that many nurses feel unprepared to care for patients with POD due to a lack of formal education on the topic. Areas of concern include prevention strategies, early identification, and their role in the management of POD.
   A. Do you feel there could be any improvements to the orientation process for nurses regarding POD?
   B. Are there any topics related to POD in which you feel the nursing staff may require further education?

5. The literature suggests that in-person lectures, self-learning modules, workshops, group discussions, and interdisciplinary collaborations are all effective strategies for providing education to nurses about POD.
   A. What method do you feel would be most effective for the nursing staff in the surgery program?

B. What educational strategies have you noted to be successful in the past?
C. Are there any other educational strategies that you feel would be effective? (e.g., quizzes, videos, handouts, resource manual, etc.).
D. Can you describe any challenges or barriers you have experienced when providing education to staff nurses within the surgery program?
E. Is there any information related to POD that you feel I should include or any recommendations you would like to make for the development of this learning resource?

6. Is there anything else related to the care of patients with POD that you would like to discuss?

Appendix F: Health Research Ethics Authority (HREA) Screening Tool

Student Name: Vanessa Foley

Title of Practicum Project: Development of a resource on the prevention, identification, and management of postoperative delirium for nurses working in acute surgical settings.

Date Checklist Completed: May 28th, 2021

This project is exempt from Health Research Ethics Board approval because it matches item number _____3_____ from the list below.

1. Research that relies exclusively on publicly available information when the information is legally accessible to the public and appropriately protected by law; or the information is publicly accessible and there is no reasonable expectation of privacy.
2. Research involving naturalistic observation in public places (where it does not involve any intervention staged by the researcher, or direct interaction with the individual or groups; individuals or groups targeted for observation have no reasonable expectation of privacy; and any dissemination of research results does not allow identification of specific individuals).
3. **Quality assurance and quality improvement studies, program evaluation activities, performance reviews, and testing within normal educational requirements if there is no research question involved (used exclusively for assessment, management or improvement purposes).**
4. Research based on review of published/publicly reported literature.
5. Research exclusively involving secondary use of anonymous information or anonymous human biological materials, so long as the process of data linkage or recording or dissemination of results does not generate identifiable information.
6. Research based solely on the researcher's personal reflections and self-observation (e.g. auto-ethnography).
7. Case reports.
8. Creative practice activities (where an artist makes or interprets a work or works of art).

For more information please visit the Health Research Ethics Authority (HREA) at https://rpresources.mun.ca/triage/is-your-project-exempt-from-review/

Appendix IV: Learning Resource

Prevention, identification, and management of postoperative delirium: A self-directed learning resource for nurses working in acute surgical settings

Vanessa Foley

200923787

Memorial University of Newfoundland

Prevention, Identification, and Management of Postoperative Delirium

A Self-Directed Learning Resource for Nurses Working in Acute Surgical Settings

Source. From Microsoft Word Stock Images

Developed by: Vanessa Foley BNRN

December 2021

Table of Contents

Introduction

Welcome to the self-directed learning resource for the prevention, identification, and management of postoperative delirium. This resource is designed to educate nurses working in acute surgical settings who care for patients at risk for experiencing postoperative delirium. It can be used in addition to orientation to the surgery program at this hospital or as a learning opportunity for any nurses currently working within the program. The development of this resource was informed by findings from an integrative literature review of recently published scholarly evidence, a review of regional resources available within Atlantic Canada, and interviews with key stakeholders.

The resource is separated into six smaller modules that each cover a different topic. These topics are outlined in the table of contents. The modules can be completed at your own pace and contain several learning activities such as self-assessment tests, reflective exercises, case studies, and videos. Completing these activities as you work through the modules will help to further your learning. Throughout the modules you will also find documentation tips and important reminders to assist you in your daily practice. There is also reference to policies and procedures within the organization that are relevant to the care of patients experiencing postoperative delirium.

In the next section you will find a pre-test. You are encouraged to take this test to assess your prior knowledge about postoperative delirium. Once you have completed each module, there is a post-test at the end which can be used to evaluate your learning.

Enjoy!

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Pre-Test

The following pre-test is designed for you to test your prior knowledge on the topic of postoperative delirium. The questions are repeated as a post-test at the end of the modules to evaluate how much you have learned. The answers can be found in Appendix A.

1. _____ is a postoperative complication that results in a sudden change in cognitive functioning.

2. Which subtype of delirium results in decreased motor activity and drowsiness?
   a.) Mixed delirium
   b.) Postoperative delirium
   c.) Aggressive delirium
   d.) Hypoactive delirium

3. Which of the following is a *predisposing* factor for postoperative delirium?
   a.) Advanced age (> 65 years old)
   b.) General anesthesia
   c.) Use of opioids
   d.) Surgical infection

4. True or False. Postoperative delirium is a normal finding after surgery in older patients.

5. True or False. Symptoms of postoperative delirium often fluctuate. The patient may cycle through periods of confusion and lucidity.

6. True or False. It has been estimated that up to 25% of delirium cases in hospitalized patients are preventable.

7. Introducing yourself to your patient, providing a visible clock, and opening the blinds in the daytime are examples of which postoperative delirium prevention strategy?
   a.) Communication
   b.) Sensory assistance
   c.) Sleep promotion
   d.) Orientation techniques

8. _____ is a class of medications that can cause constipation, sedation, and respiratory depression. These should be given in the low doses for high-risk patients, as they can contribute to postoperative delirium.

9. True or False. Bowel management is an important preventative nursing intervention, as constipation is associated with delirium.

10. Performing proper hand hygiene, avoiding urinary catheters, and reducing the risk of aspiration are all interventions associated with which postoperative delirium prevention strategy? _____

11. To recognize the onset of postoperative delirium and differentiate this syndrome from other conditions, it is necessary to know the patient's _____ cognitive function.
   a.) Expected
   b.) Self-proclaimed
   c.) Baseline

12. Which of the following is not one of the features of the Confusion Assessment Method?
   a.) Altered Level of Consciousness
   b.) Disorganized Thinking
   c.) Long Term Memory
   d.) Inattention

13. When should the Confusion Assessment Method first be administered?
    a.) At the onset of symptoms
    b.) On admission
    c.) After surgery
    d.) Once the patient has been diagnosed with postoperative delirium.

14. True or False. Preventative strategies (e.g., sleep promotion, early mobility, family involvement) should be continued when managing postoperative delirium, whenever appropriate.

15. Which of the following medications ordered by the medical team would be most appropriate to promote sleep for a patient with postoperative delirium?
    a.) Melatonin
    b.) Temazepam
    c.) Zopiclone
    d.) No options would be appropriate.

16. True or False. You should always try to reorient a patient with postoperative delirium to their surroundings, even if they are becoming agitated.

17. True or False. Educating high-risk patients and their families about postoperative delirium should only be done once the patient begins exhibiting symptoms.

18. True or False. Family members should be encouraged to alert nursing staff if they notice any cognitive changes in the patient.

The answers for the pre-test can be found in Appendix A.

Module One:

Overview of Postoperative Delirium

Module One: Overview of Postoperative Delirium

The purpose of Module One is to provide an overview of postoperative delirium. This will provide you with an understanding of the presentation of postoperative delirium and implications for patients, families, nurses, and the healthcare system at large. A definition of postoperative delirium is provided, and incidence rates are discussed. The module includes subtypes of delirium and the associated signs and symptoms that you may encounter. Factors associated with postoperative delirium and potential outcomes are noted. There is a YouTube video embedded within the module that discusses a patient's personal experience with postoperative delirium after cardiac surgery. Several challenges that nurses face when caring for this patient population are also discussed.

Learning Objectives

After completing this module, you will be able to:

1. Define postoperative delirium
2. Identify signs and symptoms associated with hyperactive, hypoactive, and mixed delirium.
3. Discuss features of postoperative delirium related to the diagnostic criteria.
4. Identify patients who are high-risk for developing postoperative delirium based on their predisposing and precipitating factors.
5. Note potential outcomes for patients who experience postoperative delirium.
6. Discuss challenges for nurses when providing care to patients with postoperative delirium.

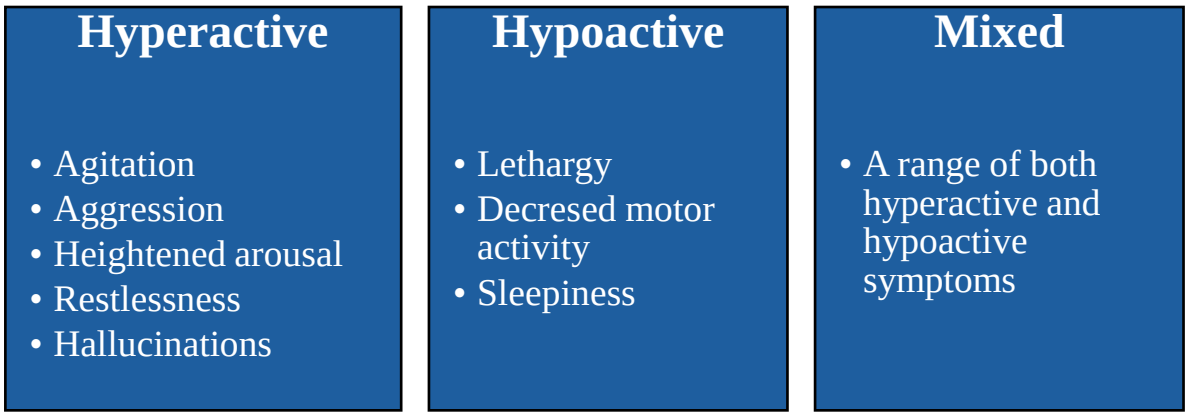
Postoperative Delirium

Delirium is a complex, abrupt change in cognitive functioning that results in variable clinical features including confusion, inattention, and agitation.[1] Delirium that presents after surgical intervention is noted as postoperative delirium. It is a common postoperative complication, with older adults most often affected. Recent literature has noted an average postoperative delirium incidence rate of 30.7% for various, non-cardiac surgeries in adult populations.[2] Other findings have suggested that this incidence rate may be closer to 50% in patients undergoing high-risk surgeries.[3]

Signs and Symptoms

Signs and symptoms of postoperative delirium often vary and can be classified into three subtypes which include hyperactive, hypoactive, and mixed delirium. Figure 1.1 outlines the findings associated with each subtype.[3-5]

Figure 1.1 Delirium Subtypes



These signs and symptoms typically begin within the first 24 hours after surgery and often fluctuate throughout the day.[5] The patient may present as lucid between periods of confusion. The fluctuating nature of postoperative delirium and the varying symptom presentation make it challenging for healthcare professionals to recognize this condition. Therefore, postoperative delirium may be undiagnosed and untreated. Specifically, nurses have identified that hypoactive delirium is more challenging to identify as patients are lethargic and may not vocalize their confusion.[6] Nurses have also noted that it can be challenging to differentiate postoperative

delirium from dementia or identify the onset of delirium in a patient who already suffers from a neurocognitive disorder.

Reflection Activity

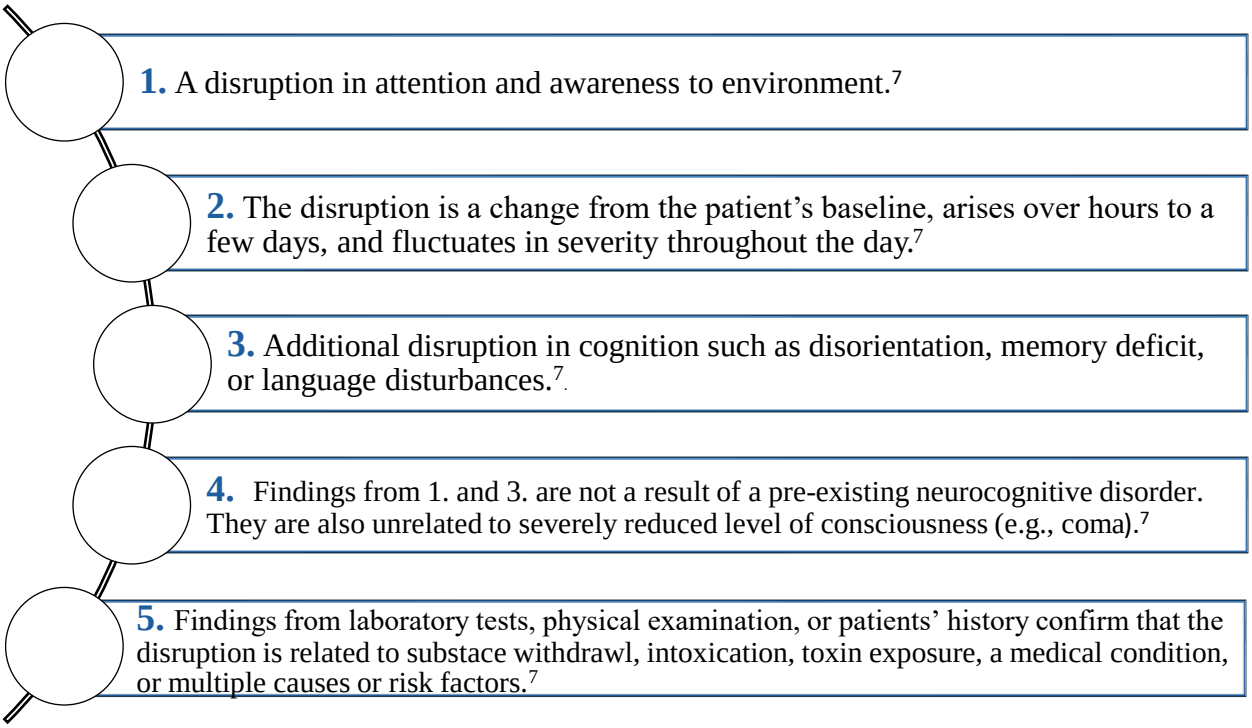
Think of a time when you cared for a patient experiencing postoperative delirium.

- **Was it challenging to identify?**
- **Was their behaviour consistent with either subtype of delirium?**
- **How was this condition managed by the interdisciplinary team?**

Diagnosis

Postoperative delirium may be mistaken for depression, dementia, or "normal aging". However, delirium can be identified by the acute onset of fluctuating cognitive changes from a patient's baseline cognition. Diagnosis is based on criteria from the Diagnostic and Statistic Manual of Mental Disorders (DSM-5).[7] Figure 1.2 below outlines information sourced from the DSM-5.[7]

Figure 1.2 DSM-5 Delirium Diagnostic Criteria[7]



Causes of Postoperative Delirium

Postoperative delirium may be caused by a single factor, such as the use of certain medications. However, this syndrome is often considered to be multifactorial as it usually develops as a result of multiple causes or risk factors. These are classified as either predisposing or precipitating factors and several examples are outlined below in Table 1.1.[1,2,4,5,8] Predisposing factors are pre-existing and make an individual more susceptible to a condition, whereas precipitating factors are those introduced that can initiate the onset of the condition. Patients who already exhibit predisposing factors are at a high risk of developing postoperative delirium when faced with precipitating factors after surgery.[1,4] It has also been suggested that adults aged 70 and older with one or more of the following risk factors should be considered high risk for delirium.[4]

Table 1.1 Predisposing and Precipitating Factors for Postoperative Delirium[1,2,4,5,8]

Predisposing Factors	Precipitating Factors
• Advanced age (> 65 years old) • Preoperative cognitive dysfunction (e.g., dementia) • Alcohol misuse • Frailty • Sedatives or psychotropic medications • Poor vision or hearing • Medical co-morbidities • Previous episodes of delirium	• General anesthesia • ICU admission • Complexity/duration of surgery • Blood loss • Infection (surgical site, respiratory, urinary tract, etc.) • Use of restraints • Use of urinary catheters • Sleep disruption • Pain • Electrolyte imbalances • Constipation • Use of anticholinergics, benzodiazepines, opioids, and sedatives

Outcomes

Patients who experience postoperative delirium are at an increased risk for delayed surgical recovery, cognitive decline, prolonged hospitalization, functional decline, and death.[3,5,9] While this results in poorer patient outcomes, it also places a strain on the healthcare system at large. The literature has noted higher healthcare costs for patients who have experienced postoperative delirium, with these costs associated with increased length of stay, ICU stay, rehospitalization, and discharge to rehabilitative facility.[10]

Important

It is crucial to understand that postoperative delirium is a SERIOUS medical syndrome that requires immediate attention so that it can be properly managed. It is a postoperative complication and NOT a normal or expected finding.

Patient Experiences

Many patients who have recovered from postoperative delirium have described traumatic experiences including terrifying hallucinations, paranoia, and feelings of impending doom.[11,12] Many individuals have expressed carrying a burden of shame for the behaviour they exhibited during their delirium. The experience can also be extremely stressful for family members.

While providing nursing care to patients with postoperative delirium can be challenging, it is important to remember that they are experiencing cognitive disturbances and are often frightened and distressed. Click the following link to watch a video regarding a patient's experience with postoperative delirium: https://www.youtube.com/watch?v=CHA2Hzg5Kkk

Source. From "Audrey Curtis's Experience with Delirium", by Patient Safety Movement[13], https://www.youtube.com/watch?v=CHA2Hzg5Kkk

Challenges for Nurses

Caring for patients experiencing postoperative delirium within the acute surgical setting can be extremely challenging. Many nurses working with this patient population have described feelings of frustration and an increase in workplace stress.[14] This is often due to the increased workload from time consuming care, such as frequent patient monitoring. Patients may be uncooperative or aggressive when nurses are trying to provide care. They may also threaten their own safety by pulling at medical lines and tubing or trying to leave their bed or room.

Lack of resources, understaffing, and safety concerns further contribute to the complexity of caring for patients with postoperative delirium.[14] The literature has also suggested that many nurses feel unprepared to care for these patients due to a lack of thorough and ongoing education about postoperative delirium.[14] Figure 1.3 highlights some of the challenges nurses face when caring for patients experiencing postoperative delirium

Figure 1.3 Challenges for Nurses Caring for Patients with Postoperative Delirium

Conclusion

Postoperative delirium presents a challenge for healthcare professionals as they must provide usual postoperative care while simultaneously managing features of delirium to prevent further complications. In acute care settings, nurses are the healthcare professionals who often spend the most time with patients and are in an ideal position to address the issue of postoperative delirium. In the following modules you will learn strategies and nursing interventions for the prevention, early identification, and management of postoperative delirium.

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Case Study 1.1

Mrs. Adams is an 82-year-old woman who recently fractured her hip and has been admitted to your unit. Her medical history includes hypertension, type 2 diabetes mellitus, COPD, anxiety, and she wears bilateral hearing aids. She is a frail woman who lives alone at home and requires daily home care for her ADLs. While waiting for her surgery, Mrs. Adams is having pain and requires PRN opioids to control her pain. Her pain has been keeping her awake throughout the night.

1. **Based on Mrs. Adam's history, what are three predisposing factors for postoperative delirium?**
2. **What are three precipitating factors for Mrs. Adams?**
3. **Based on the predisposing and precipitating factors, would you consider Mrs. Adams to be of high-risk for postoperative delirium once she has her surgery?**

Mrs. Adams has her surgery to fix her hip fracture. The next day she is alert and oriented. She requires assistance and encouragement with ambulation. Her vital signs are stable, and she is being weaned off oxygen. On postoperative day two, she becomes increasingly restless and is picking at her IV line and bed sheets. When you try to reorient her, she demands you leave her "house". She becomes more lucid throughout the afternoon, but later states that she sees bugs crawling all over the walls and ceiling.

4. **These symptoms are consistent with which subtype of delirium?**

Answers can be found in Appendix B.

Source. From Microsoft Word Stock Images

References

1. Inouye, S. K., Westendorp, R., & G. J., Saczynski, J. S. (2014). Delirium in elderly people. *Lancet, 383*, 911-922. https://doi.org/ 10.1016/S0140-6736(13)60688-1

2. Silva, A. R., Regueira, P., Albuquerque, E., Baldeiras, I., Cardoso, A. L., Santana, I., & Cerejeira, J. (2021). Estimates of geriatric delirium frequency in noncardiac surgeries and its evolution across the years: A systematic review and meta-analysis. *JAMDA, 22*(3), 613-620. https://doi.org/10.1016/j.jamda.2020.08.017

3. American Geriatrics Society (2014, October 10th). *Clinical practice guideline for postoperative delirium in older adults*. https://www.archcare.org/sites/default/files/pdf/ags-2014-clinical-practice-guideline-for-postop-delirium-in-older-adults.pdf

4. Registered Nurses' Association of Ontario (2016, July). *Delirium, dementia, and depression in older adults: Assessment and care.* https://rnao.ca/sites/rnaoca/files/3Ds_BPG_WEB_FINAL.pdf

5. Schenning, K. J. & Deiner, S. G. (2015). Postoperative delirium in the geriatric patient. *Anesthesiology Clinics, 33*(3), 505-516. https://doi.org/10.1016/j.anclin.2015.05.007

6. Oberai, T., Killington, M., Laver, K., Crotty, M., & Jaarsma, R. (2019). "Just another piece of paperwork": Perceptions of clinicians on delirium screening following hip fracture repair elicited in focus groups. *International Psychogeriatric, 31*(6), 877-884.

7. American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental Disorders* (5th ed.). Arlington, VA: Author.

8. Watt, J., Tricco, A. C., Talbot-Hamon, C., Pham, B., Rios, P., Grudniewicz, A., Wong, C., Sinclair, D., & Straus, S. E. (2018). Identifying older adults at risk of delirium following elective surgery: A systematic review and meta-analysis. *Journal of General Internal*

Medicine, 33(4), 500-509. https://doi.org/10.1007/s11606-017-4204-x

9. Bai, J., Liang, Y., Zhang, P., Liang, X., He, J., Wang, J., & Wang, Y. (2020). Association between postoperative delirium and mortality in elderly patients undergoing hip fractures surgery: A meta-analysis. *Osteoporosis International, 31*, 317-326. https://doi.org/10.1007/s00198-019-05172-7

10. Guo, R. Y., Hshieh, T. T., Marcantonio, E. R., Cooper, Z., Jones, R. N., Travison, T. G., Fong, T. G., Abdeen, A., Lange, J., Earp, B., Schmitt, E. M., Leslie, D. L., & Inouye, S. K. (2021). One-year Medicare costs associated with delirium in older patients undergoing major elective surgery. *JAMA Surgery*, *156*(5), 462-470. https://doi.org/10.1001/jamasurg.2020.7260

11. Lingehall, H. C., Smulter, N., Olofsson, B., & Lindahl, E. (2015). Experiences of undergoing cardiac surgery among older people diagnosed with postoperative delirium: One year follow-up. *BMC Nursing, 14*(17). https://doi.org/10.1186/s12912-015-0069-7

12. Pollard, C., Fitzgerald, M., & Ford, K. (2015). Delirium: The lived experience of older people who are delirious post-orthopedic surgery. *Mental Health Nursing, 24*, 213-221. https://doi.org/10.1111/inm.12132

13. Patient Safety Movement. (2019). *Audrey Curtis's Experience with Delirium* [Video]. https://www.youtube.com/watch?v=CHA2Hzg5Kkk

14. Thomas, N., Coleman, M., & Terry, D. (2021). Nurses' experiences of caring for patients with delirium: Systematic review and qualitative evidence synthesis. *Nursing Reports, 11*(1), 164-174. https://doi.org/10.3390/nursrep11010016

Module Two:

Prevention of Postoperative Delirium

Module Two: Prevention of Postoperative Delirium

The purpose of Module Two is to outline nursing care that can assist in preventing postoperative delirium. These are practical interventions that you can apply to your own nursing practice. Several prevention strategies will be outlined including orientation techniques, pain management, sleep promotion, early mobility, avoidance of restraints, adequate nutrition and hydration, bowel management, sensory assistance, infection prevention, family involvement, adequate oxygenation, and medication review.

Learning Objectives

After completing this module, you will be able to:

1. Perform orientation strategies that will assist in keeping patients aware of their surroundings in the postoperative period.
2. Provide pharmacologic and nonpharmacologic pain management strategies that are safe for patients who are high-risk for developing postoperative delirium.
3. Promote sleep through a variety of nonpharmacological interventions.
4. Identify strategies for safe, early mobility after surgery.
5. Recognize the importance of avoiding restraints and identify other safety measures that can be used.
6. Promote adequate nutrition and hydration and identify indications for Speech-Language Pathology and Dietician consults.
7. Conduct pharmacologic and nonpharmacologic nursing interventions that serve to prevent constipation.
8. Recognize the importance of appropriately using sensory assistance to maintain orientation.
9. Identify strategies to reduce the risk of infection including surgical site, respiratory, urinary tract, and sepsis.
10. Discuss ways to involve patient's family members in their care.
11. Identify strategies for ensuring adequate oxygenation.
12. Identify medications that should ideally be avoided in elderly patients who are high-risk for postoperative delirium.

Prevention of Postoperative Delirium

It has been estimated that up to 40% of delirium cases in hospitalized patients are preventable.[1] Findings from recent literature have also suggested that both nurse-led and interdisciplinary team-led prevention protocols have been effective in reducing rates of postoperative delirium after various types of surgery.[2-7] As postoperative delirium is a common and challenging surgical complication, it is crucial to implement preventative measures to reduce the incidence of this syndrome. Preventative measures should be executed by nurses with patients that are deemed high-risk because they experience predisposing and/or precipitating factors for postoperative delirium. The following nursing interventions should be implemented on admission whenever possible, **PRIOR** to the onset of postoperative delirium symptoms:

- ► Orientation techniques
- ► Pain management
- ► Sleep promotion
- ► Early mobility
- ► Avoidance of restraints
- ► Adequate nutrition and hydration
- ► Bowel management
- ► Sensory assistance
- ► Infection prevention
- ► Family involvement
- ► Adequate oxygenation
- ► Medication review

Orientation Techniques

Orientation techniques should be used when communicating with the patient to keep them familiar with their surroundings.[8]

- Introduce yourself and your role to the patient on first contact and throughout your interactions with them. Noting your name on the whiteboard can also help.[8]
- Make comments regarding place, time, and surroundings[8] (e.g., noting the time of day when you are talking to the patient).
- Address the patient by their preferred name.
- Provide instructions that are short and simple.

Source. From Microsoft Word Stock Images

- Encourage the use of familiar and personal objects in the patient's room.[8]
- Ensure a clock is visible whenever possible and that the time is correct.[8]
- Use appropriate lighting by opening blinds in the daytime and dimming lights at night.[8]
- Try to avoid unnecessary room changes as this can contribute to disorientation.[9] Also try to place extremely high-risk patients in rooms close to the nursing station whenever possible.

Pain Management

Managing pain can be challenging as both untreated pain and the use of opioids can contribute to postoperative delirium.[1] Therefore, it is important to properly assess and manage pain, while using the lowest possible doses of opioids.

- Assess pain frequently.[8] You may have to use non-verbal cues such as grimacing, guarding, or restlessness in your assessment.
- Choose nonopioid analgesics when possible.
- Postoperative medication orders may include PRN opioids to manage pain that are often written with a dosing range. When giving the first dose postoperatively, begin with a low dose. Slowly increase doses as needed to achieve pain control while still using lowest possible dose of opioids.
- Opioid medications can also cause constipation, sedation, and respiratory depression which can further contribute to the development of postoperative delirium.[1]
- Combine medications with nonpharmacological methods of pain relief as appropriate.[8] These may include ice packs, guided imagery, music, or distraction.
- Using a pain scale[8] (e.g., 1 - 10 where 10 is the worst pain the patient has ever experienced) before and after medication administration can help to determine if the medication and dosing were effective.

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Sleep Promotion

Sleep promotion is crucial, as sleep deprivation is associated with increased risk for postoperative delirium.[9,10]

- Encourage night-time sleep by dimming lights and reducing noise as much as possible at bedtime.[8,9,11]
- Limit day-time napping. Try to keep the patient cognitively stimulated through conversation or activities (e.g., Offering reading materials).[8,11]
- Try to limit interruptions throughout the night and cluster interventions when possible (e.g., Try to combine medication administration, toileting, and vital signs during the same interaction, if possible).[8,9]
- Encourage toileting before bedtime to try to avoid waking overnight.
- Encourage the use of non-pharmacological interventions such as music, relaxation techniques, sleep masks, etc.[8,9]
- If medications are required to achieve sleep, communicate with the physician or NP about options that would be appropriate for high-risk patients. Non-sedating options (e.g., Melatonin) should be considered, as sedating medications have been associated with postoperative delirium.

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Early Mobility

Prolonged immobility after surgery is associated with an increased risk of postoperative delirium.[9] Early mobility should be encouraged as appropriate for the individual patient.

- Work closely with Physiotherapists (PT) and Occupational Therapists (OT) to assist in meeting the patient's mobility goals. If there is no PT/OT consult and you feel it would be appropriate, communicate with the medical team.[8,9]
- Encourage self care and increasingly independent mobility as appropriate.[8]

- Initiate preventative fall risk measures for patients who have been determined to be high fall risk.
- Use assistive devices (ex. walkers) as needed to promote safety.[8,9]
- Ensure the use of non-slip footwear.[8]
- Work towards progressive mobility goals.[8]
- If the patient is ordered *activity as tolerated* but cannot ambulate, use mechanical assistance (ex. mechanical lift) as appropriate to get the patient out of bed and into a seated position. Range-of-motion exercises may also be appropriate for patients unable to ambulate.[8,9]

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Avoidance of Restraints

Physical and chemical restraints should not be used as a preventative safety measure for patients who are high-risk for postoperative delirium. Use of restraints has been associated with increased delirium and there are other effective safety measures that can be implemented instead.[9,12]

- Bed alarms and/or close surveillance can be implemented if you suspect a patient may be at risk for climbing out of bed or wandering.

Important

Review the organizational policy regarding the philosophy of least restraints and indications for use. You can access the most updated version on the organization's intranet.

Adequate Nutrition and Hydration

Electrolyte imbalances, dehydration, and inadequate nutrition are associated with an increased risk of delirium.[9,12]

- If appropriate for the patient's surgery, encourage oral fluids often.[9] If the patient is not drinking well or unable to consume oral fluids, communicate these findings with the medical team.
- If the patient wears dentures, ensure they are available for mealtimes.[8]
- Assess the patient's ability to feed themselves.[8] If required, help with setting up their meal tray, opening packaging, and/or feeding.
- If there are concerns with swallowing, communicate these findings with the medical team as a Speech-Language Pathology consult may be required.
- Similarly, a Dietician consult may be appropriate if there are concerns about the patient meeting their nutritional needs.[8]

Bowel Management

Avoidance of constipation is essential, as it is a noted risk factor for delirium.[9]

- As mentioned above, it is important to ensure adequate hydration and nutrition.[8] This can help to encourage regular bowel movements. This also depends on the surgery, as some patients are required to be NPO or have a slowly advancing diet after surgery.
- Offer and assist with regular toileting.[8]
- Monitor bowel movements in the postoperative period and note them in the patient's medical record.
- When the patient has not had a bowel movement in the few days after surgery, medications such as stool softeners, laxatives, or enemas may need to be considered. If these are already ordered as PRN medications, it is at your discretion and therefore it is important to be monitoring the patient's bowel movements postoperatively. Again, this is dependent on the surgery as bowel medications are not appropriate in all cases. You should always refer to the medication order set and communicate any concerns with the medical team.

Sensory Assistance

Sensory deprivation has been associated with risk for delirium.[9] Appropriate use of sensory assistive devices can help to keep the patient oriented to their surroundings.

- Ensure patients who require eyeglasses, contacts, or magnifying glasses have them available within their reach when not in use.
- Ensure that hearing aids are also in use or easily accessible and that they are functioning. This may require charging the devices or changing batteries.
- Ensure there is adequate lighting when the patient is awake.[8]

Source. From Microsoft Word Stock Images

Infection Prevention

Infection can increase an individual's risk of experiencing postoperative delirium.[10] There are several nursing interventions that can assist in lowering the risk for infection.

- Monitor for infections including surgical site, respiratory, urinary tract, and sepsis and communicate any findings with the medical team.
- Utilize aseptic or sterile techniques as required.[8]
- Perform hand hygiene before patient/environment contact, before procedures, after risk of body fluid exposure, and after patient/environment contact.[8]
- Avoid the use of urinary catheters when possible or look to discontinue them as soon as medically appropriate as they can be a source for infection. Consider using in-and-out catheters rather than indwelling Foley catheters, whenever possible, to lower risk of infection.[8]
- Ensure the patient is seated in a chair or with the head of the bed elevated when eating to reduce the risk of aspiration and potential pneumonia.[8]

Source. From Microsoft Word Stock Images

Family Involvement

Having family members present at the beside can provide comfort and familiarity for the patient and can help to promote orientation to their surroundings.

- Encourage family visitation as appropriate.[8,9,11]
- Educate family about interventions they can implement themselves if appropriate, such as offering oral fluids, walking with the patient, and using orientation techniques.
- If family members are unable to visit in person, encourage phone calls, video calls, and/or pictures in the room.[8]

Source. From Microsoft Word Stock Images

Adequate Oxygenation

Hypoxia is associated with confusion and increased risk of delirium.[9] Ensuring that the patient is adequately oxygenated is a vital nursing intervention.

- Monitor oxygen saturation frequently to ensure the patient is appropriately oxygenated.[9]
- If the patient is receiving any oxygen, educate them about why they require the oxygen and the importance keeping the device (ex. nasal prongs) in place.
- Encourage deep breathing and the use of incentive spirometers as appropriate.

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Medication Review

Psychotropic and sedating medications have been associated with increased risk of delirium for elderly patients.[12] Table 2.1 below details some medications that should be avoided, when possible, with elderly patients who are high risk for developing postoperative delirium.[9,12]

Table 2.1 Medications to Avoid with Patients at High-Risk for Postoperative Delirium

Drug Class	Indication	Examples
Antipsychotics	Used to decrease symptoms of psychosis	Haloperidol (Haldol) Olanzapine (Zyprexa) Risperidone (Risperdal)
Benzodiazepines	Used to treat anxiety, seizures, insomnia, panic disorders, etc.	Lorazepam (Ativan) Alprazolam (Xanax) Clonazepam (Klonopin)
Opioids	Used to provide pain relief	Morphine Codeine Oxycodone Hydromorphone (Dilaudid)
Sedative-hypnotics	Used to treat insomnia or anxiety	Zopiclone (Imovane)
Anticholinergics	Used in several disorders. Block action of acetylcholine.	Amitriptyline Diphenhydramine (Benadryl) Dimenhydrinate (Gravol)

A review of the patient's medications should be done on admission[9]:

- Note any over the counter medications that the patient takes in addition to their prescribed medications.
- Note any concerning medications or doses and communicate these findings with the medical team. Issues of polypharmacy or inappropriate medications should be addressed.
- For elderly patients, the medical team may choose to consult the ACE (i.e., Geriatrics) team for medication review. They may decide to discontinue or modify dosages of current medications.

Reflection Activity

Have you already been implementing any of these postoperative delirium prevention strategies in your practice? What are some ways you can incorporate more strategies into your nursing care? Are there any barriers to providing preventative care? How can you approach these issues?

Conclusion

Nearly half of the cases of delirium in hospitalized patients are thought to be preventable.[1] Nurses should work closely with the interdisciplinary team to provide preventative care that can lower the rate of postoperative delirium in high-risk patients.[2-7] It is important to document any strategies used, as this provides confirmation of the nursing care you have provided. Please complete the case study provided at the end of the module to review your learning.

Case Study 2.1

Case Study 2.1 is a continuation of the same patient scenario as Case Study 1.1:

Mrs. Adams is an 82-year-old woman who recently fractured her hip and has been admitted to your unit. Her medical history includes hypertension, type 2 diabetes mellitus, COPD, anxiety, and she wears bilateral hearing aids. She is a frail woman who lives alone at home and requires daily home care for her ADLs. While waiting for her surgery, Mrs. Adams is having pain and requires PRN opioiods to control her pain. Her pain has been keeping her awake throughout the night.

What are three postoperative delirium prevention strategies that can be implemented before Mrs. Adams even has her surgery? Explain how these would help to prevent postoperative delirium.

Mrs. Adams has her surgery to fix her hip fracture. The next day she is alert and oriented. She requires assistance and encouragement with ambulation. Her vital signs are stable, and she is being weaned off oxygen.

Name three prevention interventions that would be appropriate to initiate postoperatively. Explain how these would help to prevent postoperative delirium.

Answers can be found in Appendix B.

Source. From Microsoft Word Stock Images

References

1. American Geriatrics Society (2014, October 10th). *Clinical practice guideline for postoperative delirium in older adults*. https://www.archcare.org/sites/default/files/pdf/ags-2014-clinical-practice-guideline-for-postop-delirium-in-older-adults.pdf

2. Chen, C. C., Li, H., Liang, J., Lai, I., Purnomo, J. D. T., Yang, Y., Lin, B., Huang, J., Yang, C., Tien, Y., Chen, C., Lin, M., Huang, G., & Inouye, S. (2017). Effect of a modified hospital elder life program on delirium and length of hospital stay in patients undergoing abdominal surgery: A cluster randomized clinical trial. *JAMA Surgery, 152*(9), 827-834. https://doi.org/10.1001/jamasurg.2017.1083

3. Choi, J., Kim, K., Kang, M., Lee, Y., Koo, K., Oh, J. H., Park, Y. H., Suh, J., Kim, N., Yoo, H., Koo, J., Moon, H. M., Kim, E. H., Park, K., & Kim, C. (2019). Impact of a delirium prevention project among older hospitalized patients who underwent orthopedic surgery: A retrospective cohort study. *BMC Geriatrics, 19*(1). https://doi/org/ 10.1186/s12877-019-1303-z

4. Guo, Y. & Fan, Y. (2016). A preoperative, nurse-led intervention program reduces acute postoperative delirium. *Journal of Neuroscience Nursing, 48*(4), 229-235. https://foi.org/10.1097/JNN.0000000000000220

5. Guo, Y., Sun, L., Li, L., Jia, P., Zhang, J., Jiang, H., & Jiang, W. (2016). Impact of multicomponent, nonpharmacologic interventions on perioperative cortisol and melatonin levels and postoperative delirium in elderly oral cancer patients. *Archives of Gerontology and Geriatrics, 62,* 112-117. https://doi.org/10.1016/j.archger.2015.10.009

6. Kratz, T., Heinrich, M., Schlaub, E., & Diefenbacher, A. (2015). Preventing postoperative delirium: A prospective intervention with psychogeriatric liaison on surgical wards in a general hospital. *Deusches Artzeblatt International, 112*, 289-296.

https://doi.org/10.3238/arztebl.2015.0289

7. Zhang, W., Sun, Y., Liu, Y., Qiu, W., Ye, X., Zhang, G., & Zhang, L. (2017). A nursing protocol targeting risk factors for reducing postoperative delirium in patients following coronary artery bypass grafting: Results of a prospective before-after study. *International Journal of Nursing Sciences, 4*(2), 81-87. https://doi.org/10.1016/j.ijnss.2017.02.002

8. American Nurses Association (n.d.). *Delirium: Prevent, identify, treat.* https://www.nursingworld.org/practice-policy/work-environment/health-safety/delirium/

9. Registered Nurses' Association of Ontario (2016, July). *Delirium, dementia, and depression in older adults: Assessment and care.* https://rnao.ca/sites/rnaoca/files/3Ds_BPG_WEB_FINAL.pdf

10. Schenning, K. J. & Deiner, S. G. (2015). Postoperative delirium in the geriatric patient. *Anesthesiology Clinics, 33*(3), 505-516. https://doi.org/10.1016/j.anclin.2015.05.007

11. Ontario Health (n.d.). *Quality standards: Delirium care for adults.* https://hqontario.ca/Portals/0/documents/ evidence/quality-standards/qs-delirium-quality-standard-en.pdf

12. Inouye, S. K., Westendorp, R., & G. J., Saczynski, J. S. (2014). Delirium in elderly people. *Lancet, 383*, 911-922. https://doi.org/ 10.1016/S0140-6736(13)60688-1

Module Three:

Early Identification of Postoperative Delirium

Module Three: Early Identification of Postoperative Delirium

The purpose of Module Three is to provide an overview of assessment for postoperative delirium. This will allow you to quickly identify the onset of postoperative delirium so that it can be effectively managed. The Confusion Assessment Method (CAM) will be outlined, including when and how to use the tool, documentation tips, and a case study to test your learning. There are also tips to combat the challenges that nurses face when trying to identify postoperative delirium.

Learning Objectives

After completing this module, you will be able to:

1. Assess for postoperative delirium using the CAM.
2. Identify the four features of the CAM.
3. Discuss the steps you should take once a patient is identified as CAM positive.
4. Conduct comprehensive documentation for positive CAM findings.
5. Identify how you can feasibly administer the CAM within your practice.
6. Discuss how to identify hypoactive delirium through the CAM.
7. Discuss how to identify postoperative delirium that is superimposed on a neurocognitive disorder, by using the CAM.

Early Identification of Postoperative Delirium

As mentioned in Module One, postoperative delirium is often unrecognized and thus, poorly managed in the clinical setting. The fluctuating nature of symptoms and/or hypoactive behaviours (e.g., drowsiness) can make cognitive changes difficult to identify.[1-3] Symptoms may also be similar to other neurocognitive conditions, such as dementia. To provide the best possible care, the goal is to quickly identify any cognitive disturbances and begin to manage the delirium.

Assessing for Postoperative Delirium

To recognize the onset of postoperative delirium and differentiate this syndrome from other conditions, it is necessary to know the patient's **BASELINE** cognitive function. This can be achieved by a thorough cognitive assessment that should be completed on admission to the surgical unit and noted within the patient's electronic medical record.

Source. From Microsoft Word Stock Images

Discussions with family members can also provide valuable information about the patient's baseline cognition, particularly in cases where they have neurocognitive conditions (ex. dementia) or have a history of delirium.[4] Cognitive assessment should be completed using validated screening tools.[2,4,5] There are several tools that have been noted to be valid, reliable, and commonly used in clinical settings. This module will only cover the Confusion Assessment Method (CAM), as it is the tool that is currently utilized within the organization.

Important

Passing on information about the patient's baseline cognition at shift change through a handover report allows the oncoming nurse to be more prepared for cognitive assessment and early identification of any changes.

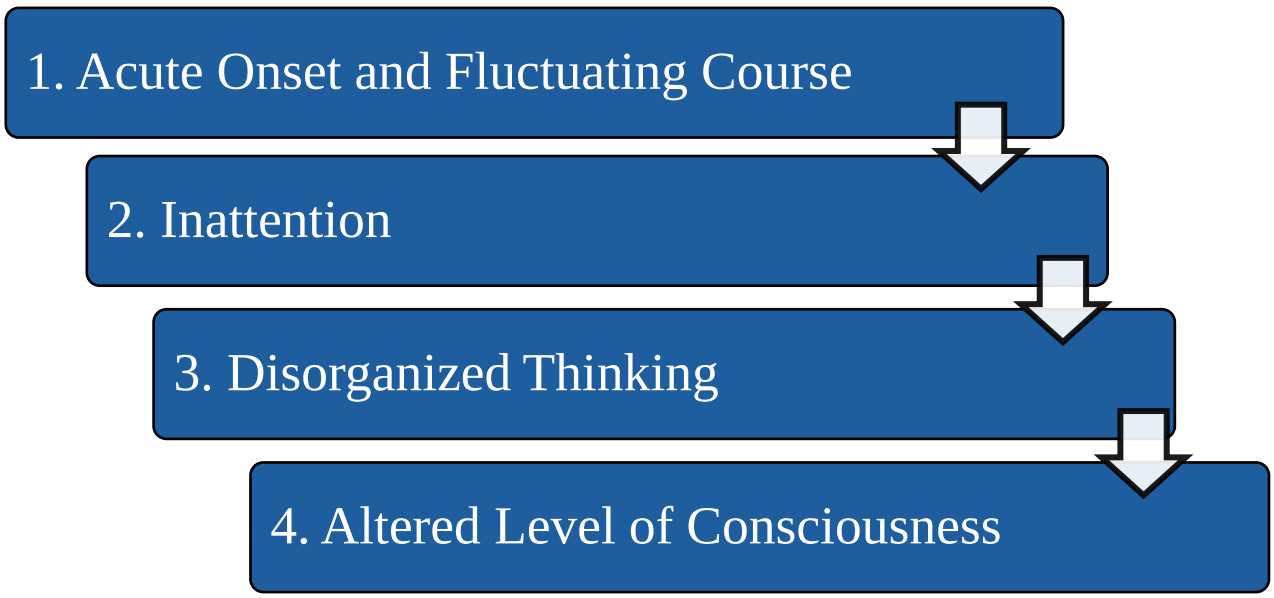
Confusion Assessment Method

The CAM is a screening tool for delirium which has been noted to be valid for use in the clinical setting, as it has both high sensitivity and high specificity.[6,7] This means that the test is able to accurately identify individuals who have delirium as *CAM positive* (i.e., high sensitivity) and those who do not have delirium as *CAM negative* (i.e., high specificity). This is the tool that is currently used within the organization for cognitive screening.[8]

This screening tool is used by nurses to assess for delirium and takes approximately five minutes to complete. It should always be completed on admission to screen for delirium, once per shift, and as needed if any cognitive changes are noted. This means the CAM should be utilized if you notice any symptoms of delirium (e.g., confusion, agitation, inattention, lethargy). It is extremely important to continue to use the CAM after surgical intervention, as the patient is at risk for developing postoperative delirium.

The CAM uses four assessment features to determine if a patient is CAM positive or negative. CAM positive means that the patient is likely experiencing delirium and should be assessed for delirium by the medical team. The most recent version of the CAM screening tool used within the organization can be found on the intranet. Figure 3.1. was created to highlight the four features of the CAM.[6]

Figure 3.1 Four Features of the Confusion Assessment Method [6]



1. Acute Onset and Fluctuating Course[6]

This feature asks if there is any evidence that the patient is experiencing an acute change in mental status from their baseline. **If yes, this feature is positive**. This information can be obtained from a family member who would be familiar with the patient's baseline cognition. Often the abnormal behaviour will fluctuate throughout the day in presence or severity.[6]

2. Inattention[6]

This feature asks if the patient has trouble with focusing attention. **If yes, this feature is positive.** Inattention is often characterized by the patient being distracted easily or unable to keep track of what is said to them.[6]

3. Disorganized Thinking[6]

This feature asks if the patient is incoherent or exhibits disorganized thinking. **If yes, this feature is positive.** The patient may ramble, discuss irrelevant topics, or have an illogical flow of ideas.[6]

4. Altered Level of Consciousness[6]

This feature asks you to rate the patient's level of consciousness with options of alert, vigilant, lethargic, stupor, or coma.[6] **For any response other than alert, this feature is positive.**

Important

If features 1 and 2, plus either 3 or 4 are positive, then the patient is considered CAM positive and likely to be experiencing delirium.[6] If not, the patient is considered CAM negative.

Once a patient is determined to be CAM positive, this finding should immediately be communicated with the medical team. This allows for a postoperative delirium diagnosis and management plan. When communicating your findings, be clear about the patient's symptoms, change from baseline cognition, and CAM positive result. Advocate for appropriate investigations and delirium management for the patient (i.e., those outlined in Module 4).

Review the organization's delirium management policy to become familiar with these investigations.[8]

Documentation Tip

A CAM positive finding, any subsequent communication with the medical team, and ordered interventions should be documented in the patient's medical record.

Data: Include any of the patient's behaviours or symptoms consistent with postoperative delirium. Note the CAM positive finding.

Action: Indicate that the physician or NP was notified and any interventions that were ordered. This may include a delirium protocol.

Response: Include any findings from the interventions. Note any further orders or changes to the patient's mental status.

After a patient has been noted to be CAM positive, the screening must be conducted every 12 hours until the patient is CAM negative for three consecutive days.[8] If there are any further changes in cognitive function, then the CAM should be resumed and conducted on each shift.

Nurses Concerns with Identifying Postoperative Delirium

Many nurses have noted concerns with using delirium screening tools in their practice. These tools have been described as unnecessary paperwork added to an already demanding workload.[9] The feasibility of the CAM in practice has been questioned, as it requires both observational and interactive components, making it a time-consuming tool. [7] However, when provided education about the CAM nurses have high compliance rates with using the tool in practice.[10,11]

Nurses have also expressed concerns about feeling less confident identifying hypoactive delirium or postoperative delirium that is superimposed on a neurocognitive disorder (e.g., dementia).[9,12] Understanding the CAM and using it in practice can help to improve confidence and identify cases of postoperative delirium that are more challenging to detect. Figure 3.2 below was created to outline some of the concerns with detecting postoperative delirium and tips for helping with early identification.

Figure 3.2: Concerns with Identification and Tips to Combat These Issues[2,4]

Time Consuming Screening Tools

- Try bundling care and administering the CAM while performing other tasks (e.g., While taking vital signs or conducting a physical assessment).
- Becoming more familiar with the CAM and what features to assess can help cut down on your time spent administering the screening.

Recognizing Hypoactive Delirium

- Need to know the patient's baseline mental status first. Can often be done by talking with family members.
- If baseline mental status is noted on admission, it is easier to identify any changes.
- Hypoactive symptoms should still result in a CAM positive finding if the screening tool is used.

Delirium Superimposed on Neurocognitive Disorders

- Need to know the patient's baseline mental status first. Can often be done by talking with family members.
- If baseline mental status is noted on admission, it is easier to identify any changes.
- Postoperative delirium superimposed on a neurocognitive disorder (eg., dementia) should still result in a CAM positive finding if the screening tool is used. If the patient's behaviours are consistent with their baseline, then they will be considered CAM negative despite any symptoms that are similar to those of postoperative delirium.

Conclusion

Early identification of postoperative delirium allows for timely intervention for this serious postoperative complication. Understanding how to recognize delirium using validated screening tools (ex. CAM) is necessary because the syndrome is often unrecognized and has serious, negative implications for the patient. See below for case studies to practice using the CAM screening tool.

Case Study 3.1

1. Mrs. Williams is a 50-year-old woman who is post-op day two from a lobectomy. During morning care, she is drowsy but arousable. When her daughter comes to visit, she notes that her mother is very sleepy but when she wakes up, she must be reminded where she is. She says that normally her mother has no issues with her memory. Mrs. Williams cannot seem to keep track of anything her daughter tells her.

Source. From Microsoft Word Stock Images

Using the CAM screening tool, would Mrs. Williams be CAM positive or negative? Why?

2. Mr. Smith is an 85-year-old man who was recently transferred from a long-term care facility for surgical fixation of a fractured hip. He has a history of dementia and has been restless, aggressive with nursing staff, and uncooperative with care. He cannot follow directions and rambles about illogical ideas when talking to nursing staff. When speaking with a nurse from the long-term care facility, they explain that this is behaviour that Mr. Smith often exhibits and that it has become progressively worse as his dementia has advanced.

Source. From Microsoft Word Stock Images

Using the CAM screening tool, would Mr. Smith be CAM positive or negative? Why?

3. Mr. Greene is a 70-year-old man who is post-op day one after a hemicolectomy. He has a history of early dementia and is becoming increasingly agitated with nursing care. Mr. Greene thinks he is in his own home and cannot focus on the conversation with his nurse as he keeps talking about how he has to go plant flowers in his garden. His wife says that while he has early dementia, he is usually oriented and cooperative, but has issues with short term memory. She explains that she had never seen this behaviour from him before.

Source. From Microsoft Word Stock Images

Using the CAM screening tool, would Mr. Greene be CAM positive or negative? Why?

Answers can be found in Appendix B.

References

1. American Geriatrics Society (2014, October 10th). *Clinical practice guideline for postoperative delirium in older adults*. https://www.archcare.org/sites/default/files/pdf/ags-2014-clinical-practice-guideline-for-postop-delirium-in-older-adults.pdf

2. Ontario Health (n.d.). *Quality standards: Delirium care for adults.* https://hqontario.ca/Portals/0/documents/ evidence/quality-standards/qs-delirium-quality-standard-en.pdf

3. Schenning, K. J. & Deiner, S. G. (2015). Postoperative delirium in the geriatric patient. *Anesthesiology Clinics, 33*(3), 505-516. https://doi.org/10.1016/j.anclin.2015.05.007

4. Registered Nurses' Association of Ontario (2016, July). *Delirium, dementia, and depression in older adults: Assessment and care.* https://rnao.ca/sites/rnao ca/files/3Ds_BPG_WEB_FINAL.pdf

5. American Nurses Association (n.d.). *Delirium: Prevent, identify, treat.* https://www.nursingworld.org/practice-policy/work-environment/health-safety/delirium/

6. Inouye, S. K., van Dyck, C. H., Alessi, C. A., Balkin, D., Siegal, A. P., & Horwitz, R. I. (1990). Clarifying confusion: The confusion assessment method. A new method for detection of delirium. *Annals of Internal Medicine, 113*(12), 941- 948. https://doi.org/10.7326/0003-4819-113-12-941

7. van Velthuijsen, E. L., Zwakhalen, S. M. G., Warnier, R. M. J., Mulder, W. J., Verhey, F. R. J., & Kempen, G. I. J. M. (2016). Psychometric properties and feasibility of instruments for the detection of delirium in older hospitalized patients: A systematic review. *International Journal of Geriatric Psychiatry, 31*(9), 974-989.

8. Babb, K., Downey, J., & Coffey-Hickey, T. (2021, June 29). *Delirium screening and*

management (Adult acute care). [Policy]. Eastern Health.

9. Oberai, T., Killington, M., Laver, K., Crotty, M., & Jaarsma, R. (2019). "Just another piece of paperwork": Perceptions of clinicians on delirium screening following hip fracture repair elicited in focus groups. *International Psychogeriatric, 31*(6), 877-884. https://doi.org/10.1017/S1041610218001369

10. Brooks, P., Spillane, J. J., Dick, K., & Stuart-Shor, E. (2014). Developing a strategy to identify and treat older patients with postoperative delirium. *AORN Journal, 99*(2), 257-273. https://doi.org/10.1016/j.aorn.2013.12.009

11. Todd, K. S., Barry, J., Hoppough, S., & McConnell, E. (2015). Delirium detection and improved delirium management in older patients hospitalized for hip fracture. *International Journal of Orthopaedic and Trauma Nursing, 19*, 214-221. https:/doi.org/10.1016/j.ijotn.2015.03.005

12. Thomas, N., Coleman, M., & Terry, D. (2021). Nurses' experiences of caring for patients with delirium: Systematic review and qualitative evidence synthesis. *Nursing Reports, 11*(1), 164-174. https://doi.org/10.3390/nursrep11010016

Module Four:

Management of Postoperative Delirium

Module Four: Management of Postoperative Delirium

The purpose of Module Four is to provide an overview of how to effectively manage postoperative delirium. This will allow you to identify your role within delirium management and promote safe interactions with patients. The organizational delirium order set is reviewed including both pharmacologic and nonpharmacologic measures. Effective communication tips are outlined, as well as ways to de-escalate patients who are agitated or aggressive due to their current mental status. Patient safety measures are also discussed.

Learning Objectives

After completing this module, you will be able to:

1. Identify expected orders from the medical team regarding managing postoperative delirium.
2. Communicate with patients experiencing postoperative delirium who may be uncooperative, agitated, or experiencing delusions or hallucinations.
3. Discuss de-escalation techniques that can be utilized when patients experiencing postoperative delirium become increasingly agitated or aggressive.
4. Identify strategies that can be used in the clinical setting to maintain patient safety for patients who are experiencing postoperative delirium.
5. Conduct comprehensive documentation for the implementation of safety strategies for patients experiencing postoperative delirium.

Management of Postoperative Delirium

It is important to remember that postoperative delirium is a surgical complication and medical emergency.[1] Timely management of this condition is essential as patients are at risk for delayed surgical recovery, prolonged hospitalization, cognitive and functional decline, and death.[2-4] Once postoperative delirium has been detected by the CAM screening and diagnosed by the medical team, the focus should be on managing the delirium. This is done by treating symptoms and any underlying causes.[1,2,5,6] However, postoperative delirium is often a result of several predisposing and precipitating factors rather than a single, treatable factor[4,7] In these cases, the goal is to mange the symptoms of the delirium while waiting for the patient's mental status to return to baseline.

Nursing interventions should include continuation of the prevention strategies (e.g., bowel management) previously outlined in Module 2. The rationale is that these strategies may help to address some of the underlying causes of postoperative delirium (e.g., proper bowel management may help to relieve constipation that is causing delirium). There are also additional nursing interventions to consider such as communication, de-escalation, and safety. These will be outlined throughout the module.

Delirium Order Set

The medical team will typically order a delirium order set that aims to identify and treat any underlying causes of the postoperative delirium (e.g., urinary tract infection).[1,2,5,6] The order set for the organization is a multicomponent, interdisciplinary protocol that includes nonpharmacologic (e.g., laboratory investigations) and pharmacologic (e.g., medication for sleep management) interventions. The policy containing a copy of the order set is available on the intranet.[5] The order set gives the physician or NP the option to check off which interventions they would like initiated. The nonpharmacologic and pharmacologic orders are outlined below.

Source From Microsoft Word Stock Images

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Nonpharmacologic Orders[5]

Table 4.1 below outlines the nonpharmacologic orders on the *Delirium Order Set* found in the *Delirium Screening and Management (Adult Acute Care)* policy.[5] Examples and rationales are provided for each category of orders.

Table 4.1 Delirium Order Set: Nonpharmacologic Orders[5]

Order	Examples	Rationale
Consults	Physiotherapy, Occupational Therapy, Social Work, Pharmacy, Speech Language Pathology, Dietician, Geriatric Medicine, or Internal Medicine.	To allow interdisciplinary team members to deliver care within their specialized scopes of practice. For example, Pharmacy may be consulted for a medication review.
Diet and Nutrition	Restrictions or types of diet.	Certain diets may be required due to the patient's surgery or clinical status. A particular diet or order to increase PO fluids is often ordered to encourage adequate hydration and nutrition.
Activity Level	Activity as tolerated, up in chair for all meals, bed rest.	To encourage mobility or restrict activity if clinically indicated.
Vitals Frequency	Q4H, QID, etc.	Vitals frequency may be increased for closer monitoring or if any abnormal vitals noted.
Lab Investigations	Bloodwork, urinalysis, or toxicology.	These are investigations for possible source of delirium (e.g., low hemoglobin, electrolyte imbalances, urinary tract infection).
Diagnostics	X-ray, electrocardiogram (ECG), or CT imaging.	• A chest x-ray may be ordered to exclude pneumonia.[5] • An ECG may be ordered to rule out any cardiac changes.[5]

		• A head CT may be ordered to rule out a change in mental status that is related to head trauma or disease.[5]
Microbiology	Urine or blood cultures	These are investigations for possible sources of infection.
Intravenous (IV) Therapy	Regular IV fluids or boluses.	To ensure adequate hydration.
Oxygen Therapy	Oxygen saturation parameters.	To ensure that patient is adequately oxygenated as low oxygenation saturation can contribute to delirium.
Urinary Assessment	Bladder scanning, intermittent catheterization for urinary retention, and toileting routine.	To assist with elimination and avoid urinary retention. Avoidance of indwelling catheters is indicated as they are a potential source of infection.

Pharmacologic Orders[5]

Table 4.2 below outlines the pharmacologic orders on the *Delirium Order Set* found in the *Delirium Screening and Management (Adult Acute Care)* policy.[5] Examples and rationales are provided for each category of medications.

Table 4.2 Delirium Order Set: Pharmacologic Orders[5]

Medication Purpose	Examples	Rationale
Sleep/Wake Cycle Management	Melatonin and Trazodone	These are milder options than sedative-hypnotics
Bowel Management	Senna, PEG, Glycerine suppositories, Bisacodyl suppositories, and Fleet enemas	To promote regular bowel habits and decrease risk of constipation.

Pain Management	Nonopioids: Acetaminophen Opioids: low doses of Morphine or Hydromorphone	Low doses of opioids are used as to control pain but not worsen delirium.
Nausea Relief	Ginger or Ondansetron	These are non-drowsy options (i.e., instead of Dimenhydrinate)
Agitation Management	Oral doses of Rispiridone, Quetiapine, Olanzepine or Loxapine (only one chosen). Intramuscular (IM) Haloperidol or Loxapine for severe agitation.	The orders are limited to low doses of these medications and only one option at a time, as antipsychotics are associated with increased mortality. The patient should be monitored for side effects (e.g., central nervous system depression, hypotension, dizziness). It is also noted that the medications should be reduced or discontinued as quickly as possible.[5]

Important

It is noted that antipsychotics and benzodiazepines increase the risk of falling and should not be used as treatment for wandering.[5] Benzodiazepines are also only indicated to be initiated if the delirium has been determined to be related to alcohol or benzodiazepine withdrawal.[5]

Communicating with Patients with Postoperative Delirium

Communicating with patients while they are experiencing postoperative delirium can be extremely challenging. These patients may be uncooperative, agitated, or aggressive because of the change in their mental status.[2,4,6] They may also be experiencing delusions or hallucinations. Positive interactions with effective communication can help to keep the patient at ease.

- Try to keep the patient's environment as quiet and calm as possible.[5]
- Introduce yourself while calmly approaching the patient. You may have to introduce yourself each time you interact with the patient.[5,8]
- Provide simple directions and ask permission before touching the patient.[5]
- Reorient the patient if possible[5,8]

Reflection Activity

Think about the last time you interacted with a patient experiencing postoperative delirium.

What strategies did you use when communicating with the patient? Were they effective? Are there any other approaches you would consider using in future interactions?

De-escalation Techniques

Unfortunately, not all interactions will be positive as some patients with postoperative delirium may be agitated or aggressive. They may also threaten their own safety by trying to flee, pulling off oxygen devices, or picking at IVs, drains, or catheters. The patient may become verbally and physically aggressive when you intervene.

- Approach the patient calmy and explain what you are doing.[5]
- Keep a safe distance (ex. two arm's lengths) from the patient in case they become physically violent.[9] If providing direct care and unable to keep a safe distance, remain aware of the patient's movements and be prepared to step away as needed.
- Keep directions simple and try to calmly reason with the patient.
- It may not be possible to reorient the patient at this time. If not, it is better to accept their current reality than to argue with them and increase their frustrations. For example, if the patient thinks they are at home, then continuing to tell them they are at the hospital may further agitate them.[5,9]
- Try to identify what the patient wants or needs.[9] They may be having pain and are unable to communicate this to you.

- Use distraction techniques.[5] You can try to have a calm conversation and ask the patient questions about themselves while trying to provide care. Another option may be to provide them with a safe object or activity to divert their attention from what is contributing to their agitation.
- In cases of severe agitation, medications may be used as chemical restraints to relax the patient and prevent them from harming themselves. Refer to the most current version of the *Delirium Screening and Management (Adult Acute Care)* policy on the intranet to become familiar with these medications.[5]

Safety

Patient safety is always the main priority and there are additional measures that may be effective and/or necessary when managing postoperative delirium. As noted above, patients may unknowingly threaten their safety in a variety of ways when experiencing a change in mental status. Increasing the frequency or level of surveillance may help to maintain patient safety in combination with a management protocol.

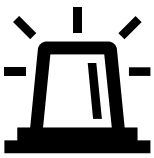
Close Observation

- This involves increasing the frequency of surveillance checks on the patient from every 60 minutes to every 15 or 30 minutes.
- This must be documented in the patient's medical record.

Source. From Microsoft Word Stock Images

Bed Alarms

- Placing a patient who is at risk for elopement on a bed with an alarm will alert nursing staff if the patient tries to exit the bed.
- This can be a good way to keep the patient from exiting the bed without the use of physical restraints.



Source. From Microsoft Word Stock Images

Constant Care

- Having staff members sit with the patient is a safer method of observation, though it is not always feasible with staffing concerns.
- Family members can also be allowed and encouraged to stay with the patient if they are able.

Source. From Microsoft Word Stock Images

Physical Restraints

- As mentioned in Module 2, the organization has a least restraint policy which indicates that restraints should only be used as a last resort when other options have been exhausted.[10] You should be familiar with the most recent version available on the intranet.
- Remember to document the use of restraints in the medical record.

Source. From Microsoft Word Stock Images

Documentation Tip

Patient behaviours and any required increase in safety measures should be documented in the patient's medical record.

Data: Include any of the patient's behaviours or symptoms that are threatening their safety. For example, the patient may be disoriented and attempting to wander from their room.

Action: Indicate which safety measures you have implemented. Note if these measures require approval from administration, the medical team, or the patient's next of kin and that this approval was acquired.

Response: Include any response to the implemented safety measures. Note any further changes to the patient's behaviour or mental status.

Conclusion

Management of postoperative delirium focuses on treating any underlying causes and controlling symptoms until the delirium resolves.[1,2,5,6] This is often accomplished with the use of a delirium order set that includes both pharmacologic and nonpharmacologic interventions. When caring for patients with postoperative delirium, nurses should also utilize effective communication and de-escalation techniques to keep patients at ease. Nurses are integral to the effective management of postoperative delirium as they deliver a variety of nursing interventions and work to maintain patient safety.

Case Study 4.1

Mr. Murphy is a 67-year-old patient who has developed postoperative delirium. The medical team has ordered the delirium order set and you are carrying out the orders along with appropriate nursing interventions.

Source. From Microsoft Word Stock Images

1. Which of the following orders would you not expect to see on the delirium order set?

a.) Chest X-ray

b.) Urinalysis

c.) Decreased vitals frequency

d.) Speech Language Pathology consult

2. Mr. Murphy has been talking about wanting to walk home. You are afraid he may try to get out of bed by himself and try to leave the unit. **What are the two most appropriate safety measures that you can implement at this time?**

i. _____

ii. _____

3. Over the next few hours, Mr. Murphy is becoming agitated and is picking at the dressing on his incision. **Which of the following responses would not be appropriate for de-escalating this behaviour?**

a.) Calmly trying to reason with Mr. Murphy.

b.) Scold his behaviour and keep reminding him that he had surgery and needs to stop touching his dressing.

c.) Assess Mr. Murphy for pain as this may be why he is picking at the dressing.

d.) Try to distract him with conversation or an activity.

4. Later in the shift, Mr. Murphy becomes increasingly agitated. He begins yelling and hitting at the nursing staff. De-escalation techniques are not working, and he will not cooperate or relax. **What are the two medications that may be ordered on the delirium order set to administer IM for severe agitation?**

_____ and _____

Answers can be found in Appendix B.

Important

As with any medications, those listed above for severe agitation should only be given if specifically ordered by the medical team.

References

1. Ontario Health (n.d.). *Quality standards: Delirium care for adults.* https://hqontario.ca/Portals/0/documents/ evidence/quality-standards/qs-delirium-quality-standard-en.pdf

2. American Geriatrics Society (2014, October 10th). *Clinical practice guideline for postoperative delirium in older adults*. https://www.archcare.org/sites/default/files/pdf/ags-2014-clinical-practice-guideline-for-postop-delirium-in-older-adults.pdf

3. Bai, J., Liang, Y., Zhang, P., Liang, X., He, J., Wang, J., & Wang, Y. (2020). Association between postoperative delirium and mortality in elderly patients undergoing hip fractures surgery: A meta-analysis. *Osteoporosis International, 31*, 317-326. https://doi.org/10.1007/s00198-019-05172-7

4. Schenning, K. J. & Deiner, S. G. (2015). Postoperative delirium in the geriatric patient. *Anesthesiology Clinics, 33*(3), 505-516. https://doi.org/10.1016/j.anclin.2015.05.007

5. Babb, K., Downey, J., & Coffey-Hickey, T. (2021, June 29). *Delirium screening and management (Adult acute care).* [Policy]. Eastern Health.

6. Registered Nurses' Association of Ontario (2016, July). *Delirium, dementia, and depression in older adults: Assessment and care.* https://rnao.ca/sites/rnaoca/files/3Ds_BPG_WEB_FINAL.pdf

7. Inouye, S. K., Westendorp, R., & G. J., Saczynski, J. S. (2014). Delirium in elderly people. *Lancet, 383*, 911-922. https://doi.org/ 10.1016/S0140-6736(13)60688-1

8. Moyle, S. (2020). *What is delirium?* Ausmed. https://www.ausmed.com/cpd/articles/postoperative-delirium

9. Richmond, J. S., Berlin, J. S., Fishkind, A. B., Holloman, G. H., Zeller, S. L., Wilson, M. P.,

Rifai, M. A., & Ng, A. T. (2011). Verbal de-escalation of the agitated patient: Consensus statement of the American association for emergency psychiatry project BETA de-escalation workgroup. *Western Journal of Emergency Medicine: Integrating Emergency Care with Population Health, 13*(1), 17-25. https://doi.org/10.5811/westjem.2011.9.6864

10. O'Keefe, J. (2019, June 11). *Least restraint: Mechanical and environmental.* [Policy]. Eastern Health.

Module Five:

Patient and Family Education

Module Five: Patient and Family Education

The purpose of Module Five is to provide you with an understanding of how you can deliver effective delirium education to patients and their families. This is education that is primarily intended for patients who are high-risk for postoperative delirium (e.g., due to advanced age). Methods for delivering this education will be discussed including verbal, electronic, and written. The information that should be included in this education will also be outlined. There will also be tips for including families in patient care during the prevention, identification, and management phases of postoperative delirium.

Learning Objectives

After completing this module, you will be able to:

1. Discuss the value of including patient's families in patient care for postoperative delirium.
2. Explain the ways in which you can provide effective education through several methods (i.e., verbal, electronic, and written) and the importance of documenting this education.
3. Note the information that should be included when providing postoperative delirium education to patients and their families.
4. Examine the ways you can include family members in patient care that aims to prevent postoperative delirium.
5. Explain how family members can be included in the early identification of postoperative delirium.
6. Discuss interventions you can teach family members who are participating in the management of postoperative delirium for their loved ones.

Patient and Family Education

Postoperative delirium is often an extremely distressing experience for patients and their families.[1,2] The literature has suggested that they often have a lack of knowledge about postoperative delirium as they are typically unaware of the syndrome prior to its onset.[3,4] Providing education may help to relieve some of this stress and potentially reduce rates of postoperative delirium.[5-7] Nurses are the healthcare professionals who often spend the most time with patients in acute care settings and are qualified to provide patient and family education. It is beneficial for nurses to include the topic of postoperative delirium in the education they provide to high-risk patients and their families to ensure they are aware of the possibility of experiencing a change in mental status postoperatively.[4]

Providing Education

Educating patients and their family members about postoperative delirium can prepare them for the possibility of experiencing this complication after surgery.[5] This is especially important for patients who would be considered high-risk due to several predisposing and precipitating factors. This education should be provided as early as possible. Ideally, this would be done on admission prior to the patient undergoing surgery. It is important to document in the patient's medical record what education was provided and the patient and family's understanding of postoperative delirium.

Source. From Microsoft Word Stock Images

Types of Education

The education you provide should be customized to the individual needs of the patient and their family.[5] Each situation will be unique, and you may have to adjust your teaching methods to ensure the patient and their family understand the information you are delivering. In general, it is important to use plain language and simple explanations.[5] Effective education should be provided in several formats including verbal, written, and/or electronic.[5] Tips for providing education through a variety of formats are outlined below:

Verbal Education

- Can be done in person or over the phone.[5]
- Speak slowly using plain language.[5]
- Avoid complicated medical terminology as much as possible.
- Answer questions appropriately. If you do not know the answer, you should seek the appropriate information and then relay this back to the patient and their family.

Written Education

- Offering written information can provide patients and families with a tangible reference to review and further their understanding.
- This can be done in the form of a pamphlet that includes information about delirium.
- Within the organization's *Delirium Screening and Management* policy there is a pamphlet available to use when educating patients and families about delirium.[8]

Electronic Education

- Provide patients and their families with appropriate electronic resources to supplement their learning.[5]
- Ensure that the resources you select are evidence-informed and appropriate for the individual.
- Nova Scotia Health Authority began a campaign in 2012 to increase delirium awareness within the community.[9] This was intended for healthcare professionals and families of high-risk patients. The website https://www.thisisnotmymom.ca/ provides information for families about delirium and how they can be involved in their loved one's care. They

also developed a video that was used a public service announcement and depicts a scene in which a daughter advocates for her mother who is displayng hyperactive delirium symptoms. Click the following link to watch the video: https://www.youtube.com/watch?v=9QURzexhWP4.

Source. From "This is not my mom! Delirium Awareness PSA", by Geriatric Medicine Research Unit[10], https://www.youtube.com/watch?v=9QURzexhWP4

Important

Remember that the education you provide should be specific to the individual patient and their family. There may have cognitive, cultural, or language needs that you must consider.[5] Some individuals may require very basic information to gain an understanding of postoperative delirium. Other individuals may need an interpreter.

Information to Include in Postoperative Delirium Education

- Provide an explanation of what postoperative delirium is.[5,11]
- Explain that postoperative delirium is a common complication after surgery and why the patient is at a higher risk (ex. Advanced age).[5,11]
- Explain the symptoms of delirium and that their altered mental status may fluctuate.[5]
- Mention that postoperative delirium often begins in the first 24 hours after surgery. It may last anywhere from days to months, though some patients may have a long-term cognitive decline.[5]
- Encourage family members and caregivers to notify nursing staff immediately if they notice any changes in the patient's cognitive status.[5,11]
- Emphasize the importance of the family's role in helping prevent, identify, and manage postoperative delirium.

Including Families in Patient Care

Including patient's families in their care may result in positive outcomes for the patient.[6,12] Family members have been noted to be helpful in comforting delirious patients and in some cases, effectively reorienting them to their surroundings.[13] Families and caregivers should be included whenever possible in the prevention, identification, and management of postoperative delirium.

Prevention

It has been noted in the literature that having family members assist with prevention strategies (e.g., early mobilization) has been associated with significantly lower rates of postoperative delirium.[6] Patients and their family members can be encouraged to participate in the following postoperative delirium prevention strategies that were outlined in Module Two:

- **Orientation techniques**: The family can note the time and place throughout their conversations with the patient. They can also bring in familiar objects.

- **Early mobility**: If appropriate, the family can assist with mobilizing the patient. Ensure they are using assistive devices (e.g., walkers) appropriately.
- **Adequate hydration and nutrition**: The family can be shown how to assist with feeding. They can also encourage hydration throughout the day.
- **Sensory assistance**: Family members can ensure the patient has any necessary sensory assistive devise (e.g., hearing aids) and is using them appropriately.

Identification

Family members are most familiar with a patient's baseline cognition, and they can be an important resource for recognizing postoperative delirium.[3] This is especially helpful in cases of hypoactive delirium or delirium superimposed on a neurocognitive disorder. Findings from the literature also suggest that family members may be able to successfully identify postoperative delirium after receiving education from nurses.[12]

- Remind family members about possible signs and symptoms they may witness.
- Encourage them to speak up if they notice any cognitive changes in their loved one.

Management

The literature has shown that many nurses feel family members are essential for the management of delirium in the acute care setting.[13] Having family at the bedside can help to improve patient safety through constant monitoring. Patients who have recovered from postoperative delirium have also described their family as a crucial support system as they brought them comfort and were able to help them become more lucid.[1,2] The following is a list of interventions you can teach or encourage families to use when assisting in the management of their loved one's postoperative delirium.

- Remind the patient that they are in hospital and had surgery. If you cannot reorient the patient, then avoid arguing.[8,9,14]
- Speak slowly and give them time to answer your questions.[8,14]
- Offer them food and water.[8,9,14]

- Comfort them. This can be done by reading to them, holding their hand, or reassuring them.[9,10]
- Do not overstimulate them.[8,9,14] Keep noises to a minimum including television and visitors. Also make sure to let them rest often.[9,14]
- Encourage them to use the bathroom regularly.[9]
- Do not try to talk about abstract ideas, test their memory, or remind them of their behaviours while they were delirious.[5,9,14]

Conclusion

Nurses should introduce postoperative delirium education to patients and their families as early as possible after admission to the unit. This is important for patients who are high-risk for developing postoperative delirium. Education can be provided in a variety of formats including verbal, electronic, and/or written. It is crucial to ensure you are meeting the individualized needs of the patient and their family. Including family members in the prevention, identification and management of postoperative delirium can also result in positive outcomes for the patient.

Case Study 5.1

Mrs. Hunt is a 74-year-old woman who is admitted on your unit with a postoperative infection from her surgery three weeks prior. She is being treated with IV antibiotics and is awaiting a second surgery. Mrs. Hunt is alert and oriented with no signs or symptoms of delirium noted on assessment. She lives with her daughter, who is present during admission and wants to actively participate in Mrs. Hunt's care You begin to explain postoperative delirium to Mrs. Hunt and her daughter.

Source. From Microsoft Word Stock Images

1. List three different points that you should make during this conversation.

i. _____

ii. _____

iii. _____

2. What are the two other ways you can provide this education, other than verbally?

i. _____

ii. _____

Mrs. Hunt has her surgery and is medically stable. At present, you are aiming to prevent postoperative delirium.

3. List three prevention strategies you can teach Mrs. Hudson's daughter so that she can implement them when visiting her mother.

i. _____

ii. _____

iii. _____

4. True or False. You should encourage Mrs. Hunt's daughter to speak up if she notices any changes in her mother's mental status.

_____

Mrs. Hunt's daughter notices that her mother is having periods of confusion, is unable to pay attention, and is rambling about illogical ideas. The medical team diagnoses her with postoperative delirium and orders the delirium order set. Mrs. Hunt's daughter is upset and wants to know how she can communicate with her mother.

5. What are three appropriate communication tips you can teach her?

i. _____

ii. _____

iii. _____

Answers can be found in Appendix B.

References

1. Lingehall, H. C., Smulter, N., Olofsson, B., & Lindahl, E. (2015). Experiences of undergoing cardiac surgery among older people diagnosed with postoperative delirium: One year follow-up. *BMC Nursing, 14*(17). https://doi.org/10.1186/s12912-015-0069-7

2. Pollard, C., Fitzgerald, M., & Ford, K. (2015). Delirium: The lived experience of older people who are delirious post-orthopedic surgery. *Mental Health Nursing, 24*, 213-221. https://doi.org/10.1111/inm.12132

3. Oberai, T., Killington, M., Laver, K., Crotty, M., & Jaarsma, R. (2019). "Just another piece of paperwork": Perceptions of clinicians on delirium screening following hip fracture repair elicited in focus groups. *International Psychogeriatric, 31*(6), 877-884.

4. Sturm, H., Wildermuth, R., Stolz, R., Bertram, L., Eschweiler, G. W., Thomas, C., Rapp, M., & Joos, S. (2019). Diverging awareness of postoperative delirium and cognitive dysfunction in German health care providers. *Clinical Interventions in Aging, 14*, 2125-2135. https://doi.org/10.2147/CIA.S230800

5. Ontario Health (n.d.). *Quality standards: Delirium care for adults.* https://hqontario.ca/Portals/0/documents/ evidence/quality-standards/qs-delirium-quality-standard-en.pdf

6. Wang, Y., Yue, J., Xie, D., Carter, P., Li, Q., Gartganis, S. L., Chen, J., & Inouye, S. K. (2020). Effect of the tailored, family-involved hospital elder life program on postoperative delirium and function in older adults: A randomized clinical trial. *JAMA Internal Medicine, 180*(1), 17-25. https://doi.org/10.1001/jamainternmed.2019.4446

7. Xue, X., Wang, P., Wang, J., Li, X., Peng, F., & Wang, Z. (2020). Preoperative individualized education intervention reduces delirium after cardiac surgery: A randomized controlled study. *Journal of Thoracic Disease, 12*(5), 2188-2196.

https://doi.org/10.21037/jtd.2020.04.26

8. Babb, K., Downey, J., & Coffey-Hickey, T. (2021, June 29). *Delirium screening and management (Adult acute care).* [Policy]. Eastern Health.

9. Nova Scotia Health Authority (n.d.). *This is not my mom: Information and resources about delirium.* https://www.thisisnotmymom.ca/

10. Geriatric Medicine Research Unit. (2012). *This is not my mom! Delirium awareness PSA.* [Video]. https://www.youtube.com/watch?v=9QURzexhWP4

11. Registered Nurses' Association of Ontario (2016, July). *Delirium, dementia, and depression in older adults: Assessment and care.* https://rnao.ca/sites/rnaoca/files/3Ds_BPG_WEB_FINAL.pdf

12. Bull, M. J., Boaz, L., Maadooliat, M., Hagle, M. E., Gettrust, L., Greene, M. T., Holmes, S. B., & Saczynski, J. S. (2016). Preparing family caregivers to recognize delirium symptoms in older adults after elective hip or knee arthroplasty. *Journal of the American Geriatrics Society, 65,* 13-17. https://doi.org/10.1111/jgs.14535

13. Thomas, N., Coleman, M., & Terry, D. (2021). Nurses/ experiences of caring for patients with delirium: Systematic review and qualitative evidence synthesis. *Nursing Reports, 11*(1), 164-174. https://doi.org/10.3390/nursrep11010016

14. Canadian Coalition for Seniors' Mental Health (2009). *Delirium in older adults: A guide for seniors and their families*. https://ccsmh.ca/wpcontent/uploads/2016/03/ccsmh_delirium Booklet.pdf

Module Six:

Self-Care and Stress Management

Module Six: Self-Care and Stress Management

The purpose of Module Six is to provide an overview of practical self-care and stress management activities. There are tips for effectively controlling stress while in the workplace. Holistic practices for improving mental, physical, and emotional health in your personal life are also discussed. There are several YouTube videos for mindfulness activities that can help you explore ways to decrease stress.

Learning Objectives

After completing this module, you will be able to:

1. Discuss ways in which you can cope with stress while in the workplace.
2. Explain the concept of mindfulness.
3. Discuss strategies for improving your mental, physical, and emotional health to better cope with stress.

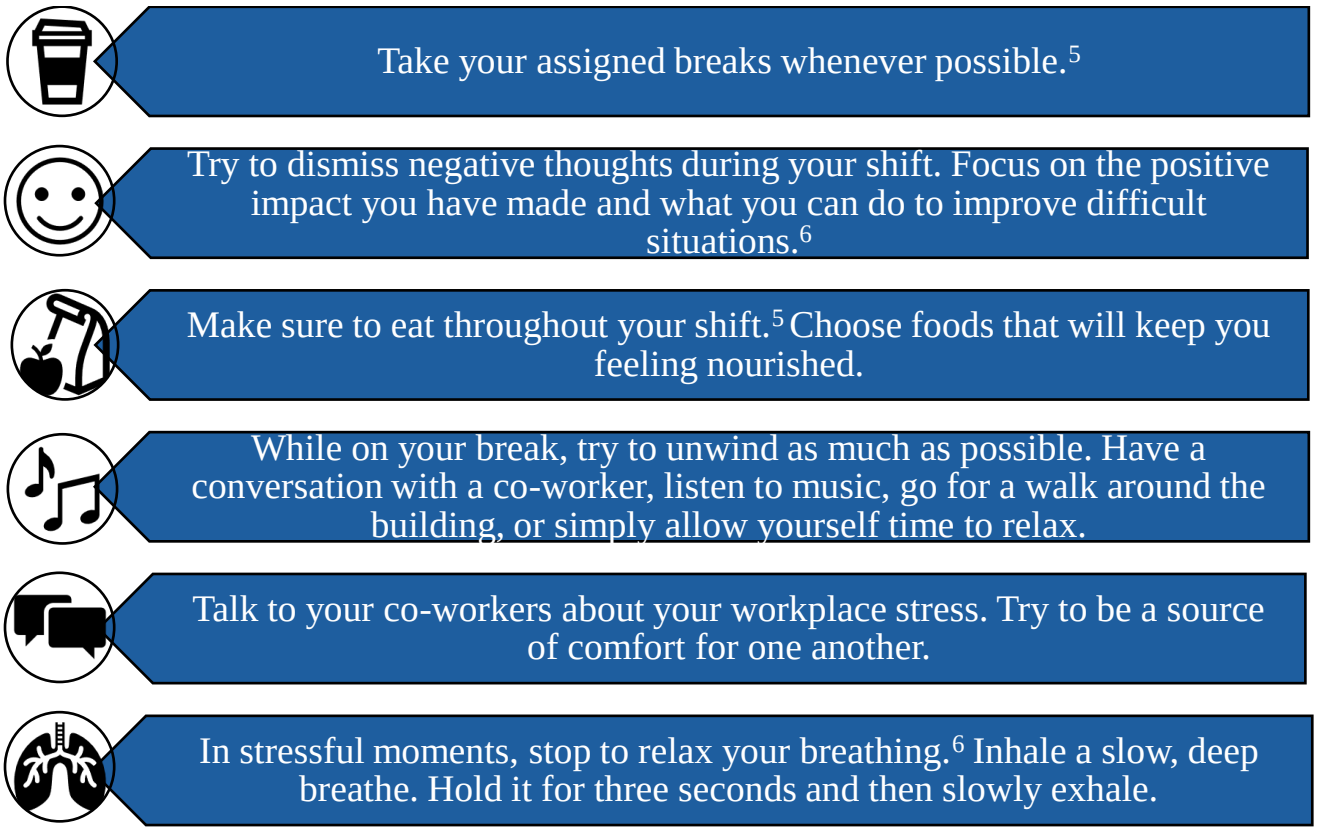
Self-Care and Stress Management

Caring for patients with postoperative delirium can often lead to increased stress and frustration for nurses.[1] As noted in Module 4, caring for this patient population often leads to increased workload. Patients with postoperative delirium may be uncooperative, agitated, or aggressive, and may experience hallucinations or delusions.[2-4] They may threaten their own safety and require increased surveillance from nursing staff. These issues can make it challenging for nurses to fulfill their role in an already busy, acute surgical setting.[1]

Self-Care and Stress Management in the Workplace

The goal with self-care and stress management is to holistically care for your body, mind, and spirit.[5] To provide quality care to patients, nurses must first seek to take care of themselves. Many shifts working in acute surgical settings are fast paced, demanding, and stressful for nurses. Figure 5.1 outlines some tips to help you cope with workplace stress as it is happening.

Figure 5.1: Tips for Self-Care and Stress Management in the Workplace



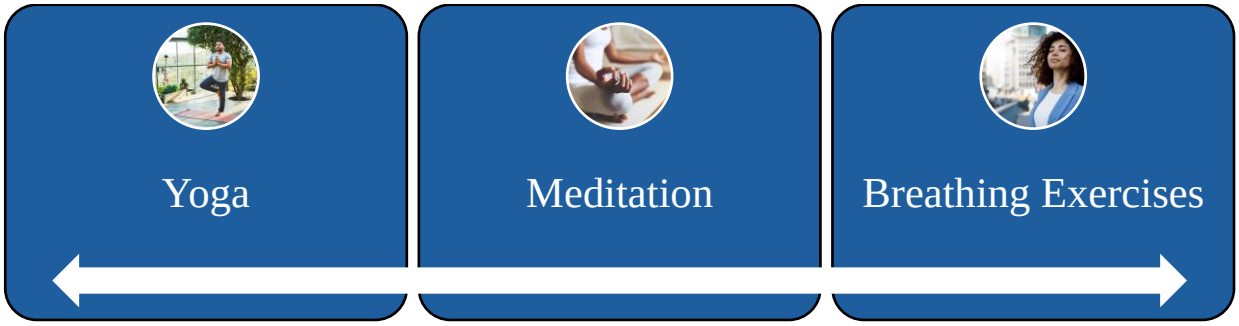
Self-Care and Stress Management at Home

Nurses can also work on self-care and stress management in their personal life to help improve their workplace stress. Working on your mental, physical, and emotional health can prepare you to deal with challenging situations in the workplace. The following section outlines several self-care and stress management practices you can implement in your personal life.

Mental Health

Mindfulness is the act of clearing one's mind to improve awareness and be present in the current moment.[7] Findings from the literature have suggested that mindfulness activities can improve nurses' mental health and work performance.[7] Figure 5.2 highlights some simple mindfulness practices you can incorporate into your personal life.[5,7]

Figure 5.2 Mindfulness Practices[5,7]



Linked below are YouTube videos for beginners who are interested in these activities:

1. **Yoga**[5,7]**:** https://youtu.be/VaoV1PrYft4

Source. From "10 minute Morning Yoga for Beginners", by SarahBethYoga[8], https://www.youtube.com/watch?v=VaoV1PrYft4

2. **Meditation[5,7]:** https://youtu.be/inpok4MKVLM

Source. From "5-Minute Meditation You Can Do Anywhere", by Goodful[9], https://www.youtube.com/watch?v=inpok4MKVLM

3. **Breathing Exercises[7]:** https://youtu.be/odADwWzHR24

Source. From "Stress & Anxiety Relief with Breathing Exercises", by AskDoctorJo[10], https://www.youtube.com/watch?v=odADwWzHR24

Physical Health

1. **Exercise:** Choose activities that you enjoy and help keep you active.[5] Try to get outdoors whenever possible.
2. **Nutrition:** Try to eat well balanced meals that keep you nourished and make you feel good.[5]
3. **Sleep:** Focus on keeping a sleep schedule that leaves you well rested. This is especially important between shifts.[5]

Source. From Microsoft Word Stock Images

Emotional Health

1. **Hobbies:** Try a new hobby that can help you relax and enjoy your free time.[5]

2. **Social Support:** Spend time with family and friends. Try to connect with your co-workers.[5]

Source. From Microsoft Word Stock Images

3. **Positive Self-Talk:** Encourage yourself to think optimistically. Remind yourself of all your positive attributes.[5]

4. **Know When to Say No:** Say "no" to extra tasks and favours when your schedule is already full. Prioritize your wellbeing.[5]

Reflection Activity

What are some of the ways you manage your stress at work? In your personal life? Are there any ways you feel you could improve your self-care? What are some ideas that may help?

Conclusion

Nurses often experience workplace stress that can negatively affect their wellbeing. Self-care and stress management practices can help you to holistically improve your wellbeing. These practices can be implemented in the workplace or in your spare time to help you cope with stress.

References

1. Thomas, N., Coleman, M., & Terry, D. (2021). Nurses' experiences of caring for patients with delirium: Systematic review and qualitative evidence synthesis. *Nursing Reports, 11*(1), 164-174. https://doi.org/10.3390/nursrep11010016

2. American Geriatrics Society (2014, October 10th). *Clinical practice guideline for postoperative delirium in older adults*. https://www.archcare.org/sites/default/files/pdf/ags-2014-clinical-practice-guideline-for-postop-delirium-in-older-adults.pdf

3. Registered Nurses' Association of Ontario (2016, July). *Delirium, dementia, and depression in older adults: Assessment and care.* https://rnao.ca/sites/rnaoca/files/3Ds_BPG_WEB_FINAL.pdf

4. Schenning, K. J. & Deiner, S. G. (2015). Postoperative delirium in the geriatric patient. *Anesthesiology Clinics, 33*(3), 505-516. https://doi.org/10.1016/j.anclin.2015.05.007

5. American Psychiatric Nurses Association (n.d.). *Self care tip sheet for nurses.* http://www.apna.org/wp-content/uploads/2021/03/APNASelfCareTipSheet.pdf

6. The Centre for Addiction and Mental Health. (2020). *Self-management in the moment: Quick tips to support yourself during the COVID-19 pandemic.* https://www.camh.ca/-/media/images/all-other-images/covid-19-professionals/tidesinfosheetselfmanagement-pdf.pdf

7. Guillaumie, L., Boiral, O., & Champagne, J. (2017). A mixed methods systematic review of the effects of mindfulness on nurses. *Journal of Advanced Nursing, 73*(5), 1017-1034. https://doi.org/10.1111/jan.13176

8. SarahBethYoga. (2017). *10 minute morning yoga for beginners* [Video]. https://www.youtube.com/watch?v=VaoV1PrYft4

9. Goodful. (2019). *5-Minute meditation you can do anywhere* [Video]. https://www.youtube.com/watch?v=inpok4MKVLM

10. AskDoctorJo. (2020). *Stress & anxety relief with breathing exercises* [Video]. https://www.youtube.com/watch?v=odADwWzHR24

Post-test

The following post-test is designed for you to test your acquired knowledge on the topic of postoperative delirium. The questions are repeated from the pre-test at the beginning of the learning resource so you can measure how much you have learned. The answers can be found in Appendix A.

1. _____ is a postoperative complication that results in a sudden change in cognitive functioning.

2. Which subtype of delirium results in decreased motor activity and drowsiness?
   a.) Mixed delirium
   b.) Postoperative delirium
   c.) Aggressive delirium
   d.) Hypoactive delirium

3. Which of the following is a *predisposing* factor for postoperative delirium?
   a.) Advanced age (> 65 years old)
   b.) General anesthesia
   c.) Use of opioids
   d.) Surgical infection

4. True or False. Postoperative delirium is a normal finding after surgery in older patients.

5. True or False. Symptoms of postoperative delirium often fluctuate. The patient may cycle through periods of confusion and lucidity.

6. True or False. It has been estimated that up to 25% of delirium cases in hospitalized patients are preventable.

7. Introducing yourself to your patient, providing a visible clock, and opening the blinds in the daytime are examples of which postoperative delirium prevention strategy?
   a.) Communication
   b.) Sensory assistance
   c.) Sleep promotion
   d.) Orientation techniques

8. _____ is a class of medications that can cause constipation, sedation, and respiratory depression. These should be given in the low doses for high-risk patients, as they can contribute to postoperative delirium.

9. True or False. Bowel management is an important preventative nursing intervention, as constipation is associated with delirium.

10. Performing proper hand hygiene, avoiding urinary catheters, and reducing the risk of aspiration are all interventions associated with which postoperative delirium prevention strategy? _____

11. To recognize the onset of postoperative delirium and differentiate this syndrome from other conditions, it is necessary to know the patient's _____ cognitive function.
   a.) Expected
   b.) Self-proclaimed
   c.) Baseline

12. Which of the following is not one of the features of the Confusion Assessment Method?
   a.) Altered Level of Consciousness
   b.) Disorganized Thinking
   c.) Long Term Memory
   d.) Inattention

13. When should the Confusion Assessment Method first be administered?
    a.) At the onset of symptoms
    b.) On admission
    c.) After surgery
    d.) Once the patient has been diagnosed with postoperative delirium.

14. True or False. Preventative strategies (e.g., sleep promotion, early mobility, family involvement) should be continued when managing postoperative delirium, whenever appropriate.

15. Which of the following medications ordered by the medical team would be most appropriate to promote sleep for a patient with postoperative delirium?
    a.) Melatonin
    b.) Temazepam
    c.) Zopiclone
    d.) No options would be appropriate

16. True or False. You should always try to reorient a patient with postoperative delirium to their surroundings, even if they are becoming agitated.

17. True or False. Educating high-risk patients and their families about postoperative delirium should only be done once the patient begins exhibiting symptoms.

18. True or False. Family members should be encouraged to alert nursing staff if they notice any cognitive changes in the patient.

Appendix A: Pre-Test and Post Test Answers

1. Postoperative delirium.
2. d.) Hypoactive delirium
3. a.) Advanced age. The other options are precipitating factors.
4. False.
5. True.
6. False. Up to 40% of cases may be preventable.
7. d.) Orientation techniques.
8. Opioids
9. True.
10. Infection prevention
11. c.) Baseline
12. c.) Long Term Memory
13. b.) On admission.
14. True.
15. a.) Melatonin
16. False
17. False.
18. True.

Appendix B: Case Study Answers

Case Study 1.1 Answers

Mrs. Adams is an 82-year-old woman who recently fractured her hip and has been admitted to your unit. Her medical history includes hypertension, type 2 diabetes mellitus, COPD, anxiety, and she wears bilateral hearing aids. She is a frail woman who lives alone at home and requires daily home care for her ADLs. While waiting for her surgery, Mrs. Adams is having pain and requires PRN opioids to control her pain. Her pain has been keeping her awake throughout the night.

1. Based on Mrs. Adam's history, what are three predisposing factors for postoperative delirium?

Options: Advanced age, frailty, poor hearing, and medical co-morbidities.

2. What are three precipitating factors for Mrs. Adams?

Sleep disruptions, pain, and opioid use.

3. Based on the predisposing and precipitating factors, would you consider Mrs. Adams to be of high-risk for postoperative delirium once she has her surgery?

Yes. She is elderly with multiple predisposing (i.e., advanced age, medical co-morbidities, frailty, and poor hearing) and precipitating factors (i.e., pain, opioid use, and sleep disruption).

Mrs. Adam's has her surgery to fix her hip fracture. The next morning, she becomes increasingly restless and is picking at her IV line and oxygen tubing. When you try to reorient her, she demands you leave her "house". She becomes more lucid throughout the afternoon, but later states that she sees bugs crawling all over the walls and ceiling.

4. These symptoms are consistent with which subtype of delirium?

Hyperactive delirium.

Case Study 2.1 Answers

Case Study 2.1 is the same patient scenario as Case Study 1.1:

Mrs. Adam's is an 82-year-old woman who recently fractured her hip and has been admitted to your unit. Her medical history includes hypertension, type 2 diabetes mellitus, COPD, anxiety, and she wears bilateral hearing aids. She is a frail woman who lives alone at home and requires daily home care for her ADLs. While waiting for her surgery, Mes. Adams is having pain and requires PRN opioiods to control her pain. Her pain has been keeping her awake throughout the night.

1. **What are three postoperative delirium prevention strategies that can be implemented before Mrs. Adams even has her surgery? Explain how these would help to prevent postoperative delirium.**

All of the strategies discussed in Module Two are options, though some are most appropriate in this case. These options are: orientation techniques, pain management, sleep promotion, sensory assistance, avoidance of restraints, family involvement, and medication review. See Module Two for rationale.

Mrs. Adams has her surgery to fix her hip fracture. The next day she is alert and oriented. She requires assistance and encouragement with ambulation. Her vital signs are stable, and she is being weaned off oxygen.

2. **Name three prevention interventions that would be appropriate to initiate postoperatively. Explain how these would help to prevent postoperative delirium.**

Any three choices from the strategies outlined in Module Two would be appropriate. These are orientation techniques, pain management, sleep promotion, early mobility, avoidance of restraints, adequate nutrition/hydration, bowel management, sensory assistance, infection prevention, family involvement, adequate oxygenation, and medication review. See Module Two for rationale.

Case Study 3.1 Answers

1. Mrs. Williams is a 50-year-old woman who is post-op day two from a lobectomy. During morning care, she is drowsy but arousable. When her daughter comes to visit, she notes that her mother is very sleepy but when she wakes up, she must be reminded where she is. She says that normally her mother has no issues with her memory. Mrs. Williams cannot seem to keep track of anything her daughter tells her.

Using the CAM screening tool, would Mrs. Williams be CAM positive or negative? Why?

Mrs. Williams is CAM positive. Features 1 (i.e., Acute Onset and Fluctuating Course), 2 (i.e., Inattention), and 4 (i.e., Altered Level of Consciousness) are all positive.

2. Mr. Smith is an 85-year-old man who was recently transferred from a long-term care facility for surgical fixation of a fractured hip. He has a history of dementia and has been restless, aggressive with nursing staff, and uncooperative with care. He cannot follow directions and rambles about illogical ideas when talking to nursing staff. When speaking with a nurse from the long-term care facility, they explain that this is behaviour that Mr. Smith often exhibits and that it has become progressively worse as his dementia has advanced.

Using the CAM screening tool, would Mr. Smith be CAM positive or negative? Why?

Mr. Smith is CAM negative. This behaviour is his baseline. Only features 2 (i.e., Inattention) and 3 (i.e., Disorganized Thinking) are positive.

3. Mr. Greene is a 70-year-old man who is post-op day one after a hemicolectomy. He has a history of early dementia and is becoming increasingly agitated with nursing care. Mr. Greene thinks he is in his own home and cannot focus on the conversation with his nurse as he keeps talking about how he has to go plant flowers in his garden. His wife says that while he has early dementia, he is usually oriented and cooperative, but has issues with short term memory. She explains that she had never seen this behaviour from him before.

Using the CAM screening tool, would Mr. Greene be CAM positive or negative? Why?

Mr. Greene is CAM positive. Features 1 (i.e., Acute Onset and Fluctuating Course), 2 (i.e., Inattention), and 3 (i.e., Disorganized Thinking) are all positive.

Case Study 4.1 Answers

Mr. Murphy is a 67-year-old patient who has developed postoperative delirium. The medical team has ordered the delirium order set and you ae carrying out the orders along with appropriate nursing interventions.

1. Which of the following orders would you not expect to see on the delirium order set?

a.) Chest X-ray

b.) Urinalysis

c.) Decreased vitals frequency

d.) Speech Language Pathology consult

2. Mr. Murphy has been talking about wanting to walk home. You are afraid he may try to get out of bed by himself and try to leave the unit. **What are the two most appropriate safety measures that you can implement at this time?**

i. Close Observation

ii. Bed Alarm

3. Over the next few hours, Mr. Murphy is becoming agitated and is picking at the dressing on his incision. **Which of the following responses would not be appropriate for de-escalating this behaviour?**

a.) Calmly trying to reason with Mr. Murphy.

b.) Scold his behaviour and keep reminding him that he had surgery and needs to stop touching his dressing.

c.) Assess Mr. Murphy for pain as this may be why he is picking at the dressing.

d.) Try to distract him with conversation or an activity.

4. Later in the shift, Mr. Murphy becomes increasingly agitated. He begins yelling and hitting at the nursing staff. De-escalation techniques are not working, and he will not cooperate or relax. **What are the two medications that may be ordered on the delirium order set to administer IM for severe agitation?**

Loxapine and Haloperidol

Case Study 5.1 Answers

Mrs. Hunt is a 74-year-old woman who is admitted on your unit with a postoperative infection from her surgery three weeks prior. She is being treated with IV antibiotics and is awaiting a second surgery. Mrs. Hunt is alert and oriented with no signs or symptoms of delirium noted on assessment. She lives with her daughter, who is present during admission and wants to actively participate in Mrs. Hunt's care You begin to explain postoperative delirium to Mrs. Hunt and her daughter.

1. List three different points that you should make during this conversation.

Any of the following points from Module Five would be appropriate:

- Provide an explanation of what postoperative delirium is.
- Explain that postoperative delirium is a common complication after surgery and why the patient is at a higher risk (ex. Advanced age).
- Explain the symptoms of delirium and that their altered mental status may fluctuate.
- Mention that postoperative delirium often begins in the first 24 hours after surgery. It may last anywhere from days to months, though some patients may have a long-term cognitive decline.
- Encourage family members and caregivers to notify nursing staff immediately if they notice any changes in the patient's cognitive status.
- Emphasize the importance of the family's role in helping prevent, identify, and manage postoperative delirium.

2. What are the two other ways you can provide this education, other than verbally?

i. Electronically

ii. Written

Mrs. Hunt has her surgery and is medically stable. At present, you are aiming to prevent postoperative delirium.

3. List three prevention strategies you can teach Mrs. Hudson's daughter so that she can implement them when visiting her mother.

Appropriate options: Orientation techniques, early mobility, sensory assistance, and ensuring adequate nutrition and hydration.

4. True or False. You should encourage Mrs. Hunt's daughter to speak up if she notices any changes in her mother's mental status.

True

Mrs. Hunt's daughter notices that her mother is having periods of confusion, is unable to pay attention, and is rambling about illogical ideas. The medical team diagnoses her with postoperative delirium and orders the delirium order set. Mrs. Hunt's daughter is upset and wants to know how she can communicate with her mother.

5. What are three appropriate communication tips you can teach her?

Any of the following communication tips outlined in Module Five would be appropriate:

- Remind the patient that they are in hospital and had surgery. If you cannot reorient the patient, then avoid arguing.
- Speak slowly and give them time to answer your questions.
- Comfort them. This can be done by reading to them, holding their hand, or reassuring them.
- Do not overstimulate them. Keep noises to a minimum including television and visitors. Also make sure to let them rest often.
- Do not try to talk about abstract ideas, test their memory, or remind them of their behaviours while they were delirious.