

# Care needs of people with dementia in the peri-operative environment: A systematic review

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## **Abstract**

The care of patients with dementia within a hospital setting remains a challenge for healthcare professionals. There is evidence showing that hospitals are not optimised for people with dementia, due to the lack of preparation of healthcare professionals and the busy nature of hospital wards. However, little is known about the experience and care of people with dementia in the perioperative environment. The aim of this review is to examine the elements of care for surgical patients with dementia in perioperative environments and articulate the specific care strategies provided by healthcare professionals to care for surgical patients with dementia and their family members. A systematic search was conducted on: BNI, CINAHL, PubMed and PsychINFO databases in accordance with PRISMA guidelines. Data were extracted and analysed within a thematic analysis framework as described by Braun and Clarke (2006). Ten papers based on eight studies were included, five containing quantitative (with a total sample of 355,010 participants) and five reporting qualitative data (395 participants). Patients with dementia experienced higher adverse postoperative outcomes. The emerging key elements in surgical care for patients with dementia included: health assessment throughout the surgical trajectory (pre, intra and postoperative); and the resources used by healthcare professionals in the perioperative care. Healthcare professionals reported difficulties in the completion of health assessments due to the cognitive status of patients with dementia and a lack of skills in dementia management. The use of restraints was still a common practice and a source of conflict. Dementia-specific training and guidelines focused on the care of surgical patients with dementia in perioperative environments are needed to improve care and improve postoperative outcomes. More research is required to develop effective programs and interventions to improve care for people with dementia and decrease complications in the perioperative care environment.

**Keywords.** Dementia; Alzheimer Disease; perioperative care; postoperative care; preoperative care; specialties, surgical; procedure; nursing care.

## Introduction

Dementia is a progressive disease that affects over 46.8 million people worldwide (Prince et al. 2016). In the UK it is estimated that 850,000 people are living with dementia, which is predicted to increase to more than one million by 2025, and two million by 2050 (Lewis et al. 2014). The increasing prevalence of dementia impacts on healthcare services, with one quarter of hospital beds occupied by patients with dementia, who have a hospital stay more than twice as long as other patients aged over 65 with the same condition (Boaden 2016).

People with dementia compared to adults without dementia have a higher prevalence of comorbidities and poorer health status (Martin-Garcia et al. 2013). In addition, adults living with Alzheimer's disease are at higher risk of requiring surgical intervention following a fall and subsequent hip fracture (Lai et al. 2013). Due to the increased incidence of dementia in older people, people living with dementia are also at risk of age-related ophthalmic problems such as cataracts (Jefferis, Mosimann and Clarke 2011). Despite this, there is limited information on the number of patients with dementia undergoing surgery. However, with the increasing prevalence of dementia, it is expected that the number of surgical procedures for this population will increase.

Hospital environments are not optimized for patients with dementia, as the impersonal and busy nature of hospital wards can be confusing and disorientating (Moyle et al. 2008). The impact of hospitalisation for patients with dementia includes an increase in behavioural and psychological symptoms of dementia (BPSD), length of stay, and poorer outcomes than other patients with the same condition but without dementia (Sampson et al. 2014, Bynum et al. 2004, Dewing and Dijk 2016). Healthcare professionals, including nurses, physicians, healthcare assistants and other health providers have reported not feeling confident to provide care for patients with dementia in the acute hospital environment (Dewing and Dijk 2016). Issues raised by healthcare professionals included: time pressures, staff shortages and the inability to manage BPSD such as agitation, resistance to care or aggression (Dewing and Dijk 2016).

Currently, there is a lack of an overview of literature exploring the perioperative trajectory of patients with dementia; therefore, the needs and major challenges for patients with dementia, their family members and healthcare professionals in perioperative environments are unknown. The findings from this literature review will establish a foundation of evidence to develop practice, effective guidelines, and a focus for further research to support and care for people with dementia who require surgical procedures.

## **Aims**

To examine the elements of care for surgical patients with dementia in perioperative environments and articulate the specific care strategies provided by healthcare professionals while caring for surgical patients with dementia and their family members.

## **Methods**

### *Search strategy*

A systematic search for papers published from 1st January 2000 to 31<sup>st</sup> December 2017 was completed using the following electronic databases: BNI, CINAHL, PsycINFO and PubMed. A combination of the search terms was applied: “Alzheimer’s” or “dementia” combined with “surgical procedure”, “surgery”, “perioperative care” or “postoperative”. In addition, reference lists from included papers were hand searched to identify further literature. Only literature written in English language was included.

The surgical trajectory was operationalised through the term perioperative and defined as occurring from: pre-operative assessment through surgery and surgical care and up until 3 days post-operative. This included the patients’ admission to the anaesthetic room, the surgical procedure, the post anaesthetic recovery room and the discharge to the surgical ward, or home.

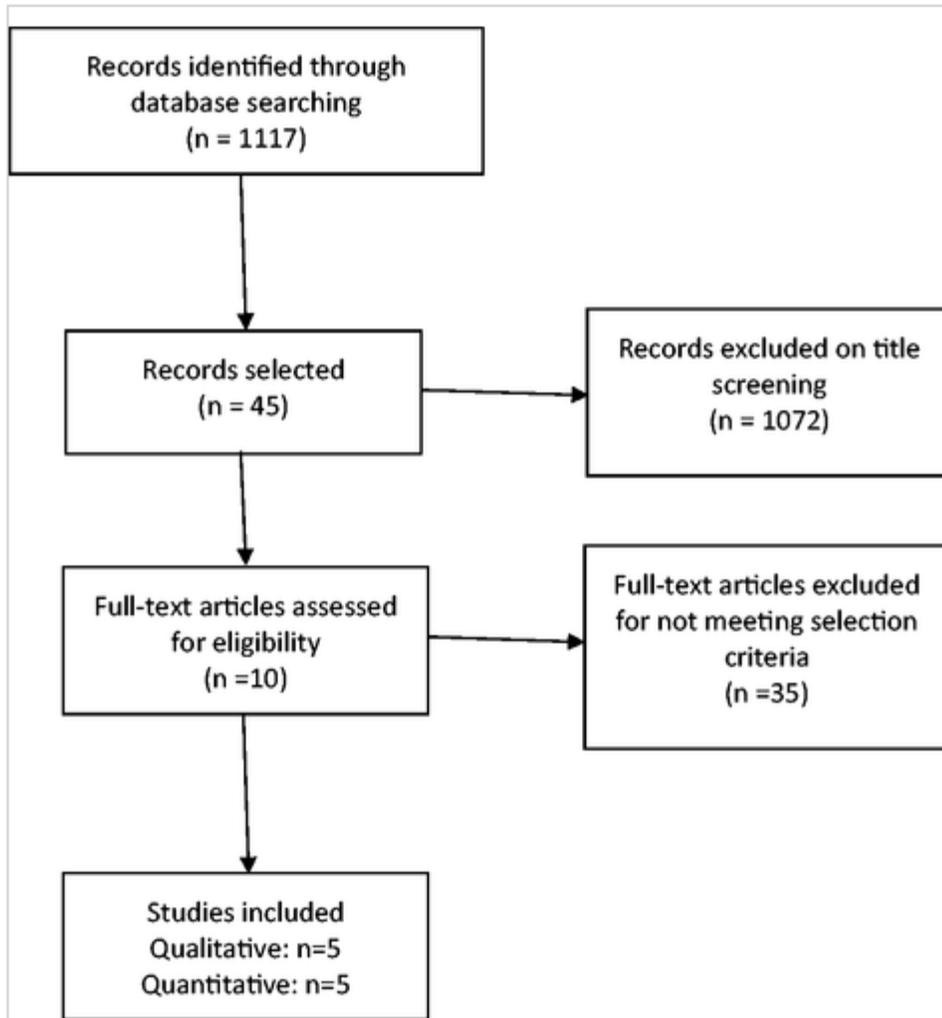


Figure 1. PRISMA flow chart of included studies related to perioperative care of people with dementia.

#### Inclusion and exclusion criteria

The inclusion criteria were studies that focused on any part of the hospital care process for people with dementia in perioperative trajectory. The exclusion criteria were studies that did not present primary data, were related to non-surgical environments, opinion articles or systematic reviews.

#### Data extraction, analysis and synthesis

The thematic analysis framework as described by Braun and Clarke (Braun and Clarke 2006) was adapted and applied to identify the elements of care across the included studies. The analysis involved a six-phase process: familiarisation with the published material, coding, searching for themes, reviewing themes, defining and naming themes

and writing up. Initial analysis undertaken by the first-named author, with a process of refinement through regular meetings and collaborations with the full author team.

### *Quality appraisal*

The included papers were evaluated to assess their scientific rigour, credibility and relevance, using the Critical Appraisal Skills Programme assessment tools. ((CASP) 2015). The papers were analysed to determine if the aims of the research and the methodology used were congruent, the findings consistent and ethical requirements satisfied. The Cohort Study checklist and the Qualitative Checklist were applied. All studies included a confidentiality statement for anonymised data. Ethical considerations were also discussed and justified. The quality appraisal of the included studies identified no issues; therefore, all papers were included in the review.

## **Findings**

From the 1117 studies screened on the initial search, 1072 were excluded on title screening and 45 were assessed with the inclusion and exclusion criteria (See Figure 1). After full-text screening, ten papers were identified, however two of the articles were separate publications with data obtained from the same study (Hynninen, Saarnio and Isola 2015a, Hynninen, Saarnio and Isola 2015b, Seitz et al. 2014b, Seitz et al. 2014a).

### *Characteristics of studies included*

Studies were conducted in Finland (n=3), Canada (n=2), with single studies from the UK, Japan, Taiwan, Denmark and Sweden. Five quantitative papers (Hu et al. 2012, Jensen-Dahm et al. 2016, Seitz et al. 2014b, Seitz et al. 2014a, Tsuda et al. 2015) used observational methodology from longitudinal cohort studies to explore postoperative complications and pain treatment, with a total number of participants of 355,010 including patients with and without dementia. Five qualitative papers (Hynninen et al. 2015a, Hynninen et al. 2015b, Jefferis et al. 2014, Krupic et al. 2016, Rantala et al. 2014) were based on findings from interviews and questionnaires and explored the participants'

perspective regarding the perioperative care of patients with dementia, with a total of 395 participants.

Three quantitative studies analysed the adverse postoperative outcomes of people with dementia (Hu et al. 2012, Seitz et al. 2014b, Tsuda et al. 2015); one examined the postoperative complications of general anaesthesia versus regional anaesthesia for people with dementia (Seitz et al. 2014a); and another one explored the pain management of hip fracture patients with and without dementia (Jensen-Dahm et al. 2016). Of the five qualitative studies, two explored nurses' perspectives (Krupic et al. 2016, Rantala et al. 2014), one the surgeon's perspective (Jefferis et al. 2014), one both nurses and physicians (Hynninen et al. 2015a) and one patients and relatives' perspectives (Hynninen et al. 2015b).

Dementia was associated with significantly prolonged hospitalisation and increased risk of death (Hu et al. 2012, Seitz et al. 2014b, Tsuda et al. 2015). Overall, results showed that surgical patients with dementia encountered significantly higher postoperative complications and required more medical resources than patients without dementia (Hu et al. 2012, Seitz et al. 2014b, Tsuda et al. 2015). The prevalence of postoperative complications was 42.7% in patients with dementia compared to 22.8% in patients without dementia (Hu et al. 2012). The most common complications after surgery for patients with dementia were surgical site infection, urinary tract infection and respiratory complications (Hu et al. 2012, Tsuda et al. 2015). Patients with dementia also had a higher risk of developing other medical complications such as: acute myocardial infarction, acute renal failure, pneumonia, septicemia, deep wound infection, pulmonary embolism, postoperative bleeding and stroke (Hu et al. 2012). In addition, healthcare professionals reported feeling unsatisfied with the care they provided to patients with dementia (Hynninen et al. 2015a, Rantala et al. 2014).

Main themes	Perioperative health assessment			Specific care strategies used by healthcare professionals			
	Pre-operative assessment	Intra-operative assessment	Post-operative assessment	Environment	Restraints	Family members	Protocols and guidelines
Hu et al. (2012)	-	-	✓	-	-	-	✓
Tsuda et al. (2015)	-	-	✓	-	-	-	-
Seitz et al. (2014)a	-	✓	-	-	-	-	-
Seitz et al. (2014)b	-	-	✓	-	-	-	-
Jensen-Dahm et al. (2016)	-	-	✓	-	-	-	✓
Rantala et al. (2012)	-	-	✓	-	✓	✓	✓
Krupic et al. (2016)	✓	✓	✓	✓	-	✓	✓
Jefferis et al. (2014)	✓	✓	-	-	-	-	-
Hynninen et al. (2014)a	-	-	✓	✓	✓	✓	✓
Hynninen et al. (2014)b	-	-	✓	✓	✓	✓	✓

*Table 2: Analysis of the elements of care*

The reasons why surgical patients with dementia encountered more postoperative complications are unclear and likely to be multifactorial (Hu et al. 2012, Tsuda et al. 2015). From the thematic analysis of perioperative care for patients with dementia two main themes of care were identified: perioperative health assessment at all stages of the perioperative trajectory; and the specific care strategies implemented by healthcare professionals, including environmental resources, restraints, family members, and protocols and guidelines (See Table 2).

## Perioperative health assessment

Main theme	Subthemes
Perioperative health assessment	Pre-operative
	Intra-operative (Choice of anaesthesia)
	Post-operative (Pain and postoperative complications)

*Table 3: Perioperative health assessment*

The patient's cognitive function was considered to be a major barrier to effective health assessment, especially in patients with advanced stages of dementia (Hynninen et al. 2015a, Hynninen et al. 2015b, Jensen-Dahm et al. 2016, Rantala et al. 2014) (See Table 3). Healthcare professionals often reported frustration when assessing the physical health of patients with dementia due to the lack of effective communication (Hynninen et al. 2015b, Krupic et al. 2016). These difficulties occurred across the preoperative, intraoperative, and postoperative periods, and were associated with under-detecting post-operative complications in these patients (Hu et al. 2012, Hynninen et al. 2015a, Rantala et al. 2014). A lack of effective assessments of patients with dementia throughout the surgical trajectory affected identification of pain, discomfort and other perioperative complications (Hynninen et al. 2015a, Hynninen et al. 2015b, Rantala et al. 2014).

### Pre-operative assessment

The importance of developing and establishing effective communication between patients and healthcare professionals was highlighted in the literature (Jefferis et al. 2014, Krupic et al. 2016). An efficient pre-operative assessment was recognised as an essential pre-requisite for surgery, but when the pre-operative assessment was completed under time pressures, understanding of the patient and their physical and psychological condition was not optimal (Jefferis et al. 2014, Krupic et al. 2016). In the presence of time pressures, physicians based their decisions on their instincts and experience rather than formal measures, and often the fact that the patient had dementia went unrecognised, creating highly distressing and potentially dangerous situations for patients and healthcare professionals (Jefferis et al. 2014). When identifying dementia, surgeons

reported changing their anaesthetic plan after a pre-operative assessment to support the individual needs of patients with dementia (Jefferis et al. 2014, Hynninen et al. 2015a).

### **Intra-operative assessment**

Two of the studies explored the use of the different types of anaesthesia in patients with dementia (Jefferis et al. 2014, Seitz et al. 2014a). Three different methods were analysed: General Anaesthesia (GA), Regional Anaesthesia (RA) and Local Anaesthesia (LA). Both GA and RA had similar rates of postoperative complications and mortality for patients with and without dementia undergoing hip surgery, with no significant evidence on which type of anaesthesia was safer for patients with dementia (Seitz et al. 2014a). LA is widely used in procedures such as cataract surgery, but this practice was often reconsidered if the patient had a diagnosis of dementia and had difficulties communicating and adhering to instructions (Jefferis et al. 2014). Ophthalmic surgeons performing cataract surgery on people with dementia sometimes chose to operate on the patient whilst they were awake using LA, and avoided GA because of the risks to the mental health of the patient (Jefferis et al. 2014). In contrast, other surgeons were concerned that the patient would become distressed during the procedure if they used LA, leading to potentially serious situation, which was more of a concern than that of the associated risks of a GA (Jefferis et al. 2014). For that reason, the use of pre and intra-operative medication in the form of sedatives or anxiolytics was considered in procedures under LA or RA, to prevent patients from feeling confused and becoming agitated (Jefferis et al. 2014, Krupic et al. 2016).

### **Post-operative assessment**

The experiences and perspectives of healthcare professionals caring for patients with dementia in surgical wards were explored and it was found that registered nurses often felt that they lacked the skills to complete and appropriate postoperative assessment for people with dementia (Hynninen et al. 2015a). Physicians had received some basic training on dementia and had developed their skills whilst working in primary care, but registered nurses stated that basic knowledge about dementia was not included in their

general education and that they required additional training (Hynninen et al. 2015a, Krupic et al. 2016).

One of the challenges that healthcare professionals encountered was the early recognition of post-operative complications (Hu et al. 2012, Hynninen et al. 2015a, Rantala et al. 2014). Challenges were associated with the busy character of hospital wards, the time required to effectively assess and observe patients with dementia, and a focus on task delivery such as medication administration or wound care, rather than on effective observation to detect significant changes (Hynninen et al. 2015a, Hynninen et al. 2015b, Krupic et al. 2016, Rantala et al. 2014). Registered nurses also reported problems identifying post-operative complications due to having insufficient knowledge on behavioural and psychological symptoms of dementia (BPSD) that might affect communication and assessment (Hynninen et al. 2015a, Krupic et al. 2016, Rantala et al. 2014). Registered nurses also felt they lacked competence in managing BPSD, especially confusion, aggressiveness or anxiety, despite dedicating more than the usual time to establishing effective communicating and delivering appropriate care (Hynninen et al. 2015a, Rantala et al. 2014).

Postoperative pain is associated with postoperative complications including: prolonged hospital stay, delay in mobility and extended rehabilitation (Jensen-Dahm et al. 2016). Jensen-Dahm et al. (2016) explored the administration of postoperative pain treatment for hip fracture patients with and without dementia and found prescription of pain medication was equal for both groups. However, although both groups were likely to receive some kind of analgesia, the total dose of opioids and paracetamol over the first 2 to 3 days postoperative was lower for patients with dementia. This study also showed that older patients with dementia were more likely to receive this medication in a pro re nata (PRN) basis rather than fixed doses. Effective use of PRN medication in this situation requires nurses recognising that patients are in pain. However, the literature suggests registered nurses frequently experienced difficulties in assessing pain, due to communication problems associated with cognitive decline (Rantala et al. 2014); meaning patients may be unable to verbally report pain; instead possibly demonstrating increased

behavioural problems such as agitation, that may not be recognised as being associated with pain (Krupic et al. 2016, Rantala et al. 2014).

### **Specific care strategies used by healthcare professionals**

Healthcare professionals reported the use of various specific resources during the perioperative care of patients with dementia, which included environmental resources, pharmacological and mechanical restraints, the inclusion of family members in the care process, and the use of guidelines, training and support programs for staff (Hynninen et al. 2015a, Hynninen et al. 2015b, Jefferis et al. 2014, Krupic et al. 2016, Rantala et al. 2014) (See Table 4).

Main theme	Subthemes
Specific care strategies used by healthcare professionals	Environmental resources
	Pharmacological and mechanical restraints
	The inclusion of family members in the care process
	Specific protocols/guidelines/training and support programs

Table 4: Care strategies

### **Environmental resources**

Designing a positive atmosphere was considered important to facilitate patients' engagement in the care process (Hynninen et al. 2015b). Maintaining a calm environment, for example, by limiting the personnel around the patient, keeping eye contact during communication or using an appropriate tone was observed to improve recovery; while stress and restlessness caused by staff and other patients impacted negatively on recuperation from surgery (Hynninen et al. 2015a, Krupic et al. 2016). Creating a familiar environment was also found to be beneficial, for example, healthcare professionals noticed that bringing personal items into the perioperative setting had a positive effect and brought comfort to patients with dementia (Krupic et al. 2016). For the LA procedures, surgeons emphasised the importance of supporting the patient with dementia by bringing someone familiar, like a close family member or carer, to the

anaesthetic room or even the operating theatre (Jefferis et al. 2014). Strategies such as having supportive nursing staff to provide confidence and reassurance to the patient, having direct physical contact, and ensuring patients were in a comfortable position were also important to create a safe environment (Jefferis et al. 2014, Krupic et al. 2016).

### **Mechanical and pharmacological restraints**

The use of restraints was associated with circumstances where the patient with dementia had become confused, anxious and agitated impacting on the care provided (Rantala et al. 2014). While healthcare professionals felt that the use of physical restraints, such as resting ties or pharmacological restraints, such as sedatives, increased patient safety, the patients and their family members found such measures humiliating and associated their use with as a source of patient-nurse conflict (Hynninen et al. 2015a, Hynninen et al. 2015b, Krupic et al. 2016). Healthcare professionals recognised that the use of restraints caused emotional distress for patients, family members and staff, but there were concerns that without their use patients could cause themselves harm, for example, by moving too soon after surgery or removing intravenous lines and catheters (Rantala et al. 2014). Registered nurses participating in Hynninen's et al. (2014a) study, reported the use of restraints was still a common practice and the main reason for its use was patient safety. Furthermore, there was no official agreed model for the use of restraints; use was solely based on the healthcare professional's professional judgement (Hynninen et al. 2015a).

### **The inclusion of family members in the care process**

Family members typically acted as the patient guardian and advocate providing information when needed, taking care of everyday matters at the hospital and participating in decision-making processes (Hynninen et al. 2015b). When family members were not available, interaction with the patient was more likely to be inadequate (Hynninen et al. 2015a). For this reason, family members desired to have an active communication with healthcare professionals regarding treatment during hospitalisation (Hynninen et al. 2015a, Hynninen et al. 2015b). The inclusion of a person

who is more familiar with the patient, such as a close family member or carer, in the perioperative care process was highly valued by the healthcare professionals, since they were more involved in the patient's life and, in addition to providing comfort and support to the patient, could sometimes detect subtle changes to their state and report them to the nurses (Krupic et al. 2016).

### **Protocols, guidelines and education for healthcare professionals**

Registered nurses recognized that a better knowledge of dementia and how the BPSD affects the perioperative care trajectory could give them the necessary skills to better manage potentially stressful situations and ease the peri-operative care experience both for patient and healthcare professional (Krupic et al. 2016, Rantala et al. 2014). Several studies highlighted the need to develop evidence-based and dementia-focused guidelines to enable healthcare professionals to meet the needs of patients with dementia in perioperative environments (Hu et al. 2012, Hynninen et al. 2015a, Hynninen et al. 2015b, Rantala et al. 2014, Seitz et al. 2014b). Specific training to improve healthcare professionals' communication techniques were recommended (Krupic et al. 2016), and nurses expected further education to support the delivery of consistent operational practices for all staff (Rantala et al. 2014).

Pain management is still one of the main challenges that healthcare professionals face every day (Jensen-Dahm et al. 2016, Rantala et al. 2014). Rantala et al. (2014) found healthcare professionals felt that the only training available was mainly directed to pain experts rather than general staff. Some of their expectations included: more guidelines, consistent practices, enhanced multi-professional cooperation and updating education regarding postoperative pain management for patients with dementia.

The lack of regulation of the nursing staff workload was also highlighted, due to patients with dementia having higher care needs this was considered an extra workload for healthcare professionals (Krupic et al. 2016, Hynninen et al. 2015a). Nurses often needed to dedicate extra time to plan and deliver care to patients with dementia (Krupic et al. 2016). Very often, healthcare professionals tried to find alternative ways to manage the

workload when looking after people with dementia, for example by rotating shifts or sharing tasks (Hynninen et al. 2015a).

A general and officially agreed approach is needed to facilitate perioperative care and support hospital staff (Hynninen et al. 2015a, Krupic et al. 2016). The availability of programs that support the wellbeing of the healthcare professionals was also mentioned, as staff can become mentally and physically fatigued when looking after patients with dementia without appropriate support (Hynninen et al. 2015a, Hynninen et al. 2015b). Working in pairs, sharing responsibilities and rotation of patient care were some of the actions taken, but having a dementia trained facilitator for consultation in perioperative areas is something still to be explored (Hynninen et al. 2015a, Rantala et al. 2014).

## **Discussion**

The study of hospital care for people with dementia has been gradually increasing in the last few years. Although previous literature reviews have explored the hospital care for people with dementia (Dewing and Dijk 2016, Di Nino et al. 2010, Digby, Lee and Williams 2017), little is known about how the surgical trajectory affects patients with dementia, their family members and the healthcare professionals looking after them.

Evidence shows that people with dementia are more at risk of adverse postoperative outcomes (Hu et al. 2012, Seitz et al. 2014b, Tsuda et al. 2015), which indicates the need of a closer post-operative monitoring and more attention to the potential sources of complications in this population. Hu et al. (2012) suggested the revision of post-operative care procedures for early recognition and active interventions to improve the quality of postoperative care for people with dementia. There is a National Dementia Strategy in the UK (DH, 2009) focused on improving the quality of care in general hospitals; however, it does not include any intervention specific to the peri-operative environment, leaving a gap in the current practice yet to be explored.

An element of care emerging from this review as key to optimal dementia care is the peri-operative health assessment. The patients with dementia showed a decline of their

cognitive capacities when they were admitted into hospital, making health assessments difficult for healthcare staff and increasing patient anxiety, affecting communication, with patients unable to express their feelings and nurses failing to detect pain, discomfort or other clinical problems. Pain management was an important aspect highlighted by registered nurses since there were no standardized guidelines available for acute postoperative pain management for people with dementia. In Rantala et al. (2014) study, registered nurses in Finland found that the existence of guidelines did not mean their implementation in practice. Therefore, the development and implementation of acute pain-specific behavioural assessment strategy for patients with dementia is needed.

Other findings include the use of restraints by the nursing staff to preserve patient safety, and although it is a frequent source of distress for the patients and relatives, staff felt it necessary to avoid the patient from inadvertently harming themselves. A report on physical restraint in hospital settings in England (Mind 2013) declared that healthcare professionals used physical restraint when patients became highly distressed, but very often they were used before considering other options. A NICE guideline was published in 2015 about violence and aggression management, which includes short-term management in health and community settings (NICE 2015). Adapting the information available for the use in peri-operative environments could be helpful and give healthcare professionals specific guidance at the different stages of the surgical trajectory.

There was a general concern about the lack of education on dementia, especially for nursing staff. While doctors receive some kind of education during their training, registered nurses felt they did not have a complete understanding of dementia and often felt that they did not deliver appropriate care, creating frustration. Healthcare professionals in general expected more support in order to deliver quality care and manage the workload; with more effort needed to create standardized guidelines and dementia-focused training to enhance care in perioperative environments. The Dementia Core Skills Education and Training Framework provides education and training for the health and care workforce in the UK and their resources are available online. However, further dissemination for all healthcare professionals in perioperative environments is

needed so more staff are able to access and obtain benefit from these (and similar) programs.

There is a need to focus research on developing practice models informed by standardized protocols and guidelines. The evidence from this review shows that care in surgical areas for people with dementia is often improvised and depends very much on the staff experience, judgement and use of resources. All this information together points to the need to acquire more evidence to establish the foundation which will lead to the development of a person-centred model of dementia care during the surgical trajectory.

This review has several limitations. First, the availability of information regarding perioperative care of patients with dementia is scarce and only 10 articles from 8 studies were included. Second, five articles included only hip-fracture patients with dementia, therefore more data with a larger mixture of surgical procedures could provide more varied results. Third, the representation of different healthcare systems is limited with only seven countries. Therefore, we would need more information that applies to every healthcare system and culture to have a better knowledge of how dementia affects postoperative outcomes worldwide and be able to develop and apply good clinical practice. The information collected from different healthcare systems and cultures will allow us to identify the common issues related to perioperative care for people with dementia and adapt our care across the UK.

## **Conclusion**

This literature review provides new insights into the perioperative care of a patient with dementia and gives an idea of the factors that most influence patients, relatives and healthcare staff during the surgical trajectory. Although some of the studies reviewed were more focused on the postoperative phase of the perioperative care pathway rather than the whole process, it shows the need for more recognition of the pre and intraoperative processes and the special needs of people with dementia in surgical environments. The review also reveals some gaps in the healthcare practice such as standardized protocols and guidelines for healthcare professionals, especially regarding

pain management, cognitive assessment and use of restraints. More support for nursing staff is needed in order to regulate the workload and avoid burnout. Lack of general knowledge about dementia itself was an important issue and most of the studies make emphasis on the need of up-to-date training for all healthcare professionals. Research needs to aim its attention at developing new strategies for hospital surgical environments to meet the needs of patients, relatives and healthcare professionals effectively.

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Author/Country	Aims	Methodology	Sample Size	Major Findings
(Hu et al. 2012) Taiwan	To characterize the general features of postoperative adverse outcomes among surgical patients with dementia.	Population-based, retrospective cohort Study	207,693 surgical patients  18,923 surgical patients with dementia	Patients with dementia who underwent surgery had a significantly higher overall postoperative complication rate compared to patients without dementia.  Acute renal failure, pneumonia, septicemia, stroke, and urinary tract infection are the top priorities for prevention among surgical patients with dementia.
(Tsuda et al. 2015) Japan	To elucidate the complications that occur after hip fracture in patients with and without dementia	Population-based, retrospective cohort study.	87,645 older adults with hip fractures.  9,419 patients with dementia.	Complications such as infections and respiratory complications after hip fracture surgery were more common in people with dementia.  Other complications such as stroke or cardiac events had no relevant difference.
(Seitz et al. 2014a) Canada	To examine the association between anaesthetic technique and postoperative complications in older adults with dementia undergoing hip fracture surgery.	Population-based, retrospective cohort study.	6,135 individuals who received general anaesthesia (GA) and 6,135 who received regional anaesthesia (RA).	Similar rates of postoperative mortality, specific medical complications and hospital length of stay for GA and RA.  RA is associated with better outcomes in general.  No greater risks observed of specific postoperative complications or mortality associated with GA.  Other factors other than anaesthesia technique are associated with postoperative outcomes on individuals with dementia.
(Seitz et al. 2014b) Canada	To evaluate the association between dementia and postoperative outcomes of older adults with hip fractures.	Population-based, retrospective cohort study.	45,602 older adults with hip fractures  16,657 patients with dementia	Compared with those without dementia, individuals with dementia were less likely to be admitted to rehabilitation facilities  Among community-dwelling older adults, dementia was associated with an increased risk of Long Term Care admission.  Dementia was also associated with a higher mortality for older adults from community.

<p><b>(Rantala et al. 2014)</b></p> <p>Finland</p>	<p>To identify barriers to postoperative pain management in hip fracture patients with dementia.</p> <p>To identify nurses' expectations and facilitators offered by employers to overcome the barriers in pain management.</p>	<p>A cross-sectional questionnaire was developed</p> <p>Open-ended questions</p>	<p>331 questionnaires</p>	<p>One-half of the nursing staff (53%) thought that postoperative pain management was sufficient among patients with dementia.</p> <p>Decline in cognition as major barrier, lack of resources as the main challenge.</p> <p>The association between pain and confusion was stated to be bidirectional.</p> <p>The staff recognized the emotional distress that restraints cause to patients and staff but felt that without restraints there was more risk.</p>
<p><b>(Jensen-Dahm et al. 2016)</b></p> <p>Denmark</p>	<p>To investigate the hypothesis that elderly hip fracture patients with dementia receive less postoperative pain treatment compared to those without dementia.</p>	<p>Population-based, retrospective cohort study.</p>	<p>1,507 patients with hip fracture.</p> <p>296 with dementia.</p>	<p>Patients with dementia received slightly lower dosages and more often received the medication pro re nata.</p>
<p><b>(Krupic et al. 2016)</b></p> <p>Sweden</p>	<p>To describe the experience of anaesthesia nurses of the difficulties that emerge in care situations and how communication with patients can be maintained in the perioperative setting of hip fracture surgery.</p>	<p>Qualitative content analysis</p> <p>Interviews</p>	<p>10 anaesthesia nurses</p>	<p>Establishing a mental bridgehead by confirming the patients' perceptions/feelings significantly reduced distress in most of the patients.</p> <p>Patients are sometimes dependent on recognition. Small personal items should be allowed during surgery.</p> <p>State-of-the-art analgesia and anxiolytic medications are mandatory.</p>
<p><b>(Jefferis et al. 2014)</b></p> <p>United Kingdom</p>	<p>To explore the experiences of cataract surgeons in managing patients with dementia</p>	<p>Qualitative study.</p> <p>Semi-structured interviews.</p>	<p>14 surgeons interviewed.</p>	<p>Choice of anaesthesia as an important issue, dementia sometimes not considered in preassessment.</p> <p>Dementia and local anaesthesia result in bad experiences for</p>

	and making anaesthetic decisions.			surgeons, in general.  Decisions sometimes made under time pressure rather than planification.  Increased time at preassessment and anaesthetic support may be beneficial.
<b>(Hynninen et al. 2015a)</b>  Finland	To describe the care of older people with dementia in surgical wards from the point of view of the nursing staff and physicians	A qualitative, descriptive design  Unstructured interviews	19 nurses  9 physicians	The nurses interviewed did not have the skills required to provide good care for people with dementia  Nurse education and training needs to be improved  Additional resources are required to provide a safe environment  Clinical written guidelines are needed
<b>(Hynninen et al. 2015b)</b>  Finland	To describe the care of older people with dementia in surgical wards from the viewpoints of the patients and their close relatives.	A qualitative, descriptive design  Unstructured interviews	7 people with dementia aged over 74  5 close relatives	Support from close relatives was significant for older dementia patients during their hospital stay.  The relatives desired more emotional support from the nursing staff.  Relatives felt that use of restraints violated patients' dignity.