



# Updated Review of Palliative Care in Dementia

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## Abstract

**Purpose of Review** Palliative care is likely to be of benefit to patients with dementia as it is with other progressive, life-limiting conditions. The purpose of this review is to provide an overview of recent updates into the research around palliative care for patients with dementia and to highlight gaps for further research.

**Recent Findings** There are disparities in hospice referrals and end of life care for patients with dementia compared to patients with other life-limiting conditions. Advance care planning interventions are being designed and tested as patients and their caregivers indicate a desire for more information from their healthcare providers, although significant challenges remain with regard to physician skills and time. Additional attention is being paid to non-cognitive symptoms of dementia, such as neuropsychiatric symptoms, with a new atypical antipsychotic medication recently submitted to the FDA for approval. Pain management, accurate prognostication, timing of palliative care interventions, and the effects of caregiving on caregiver health remain understudied areas.

**Summary** There have been many recent advances in palliative care research as it pertains to patients with dementia. However, several gaps remain. Future research will be important to close these gaps in order to further optimize the care of patients with dementia.

**Keywords** Dementia · Palliative care

## Introduction

Palliative care is intended to relieve the suffering of patients with a serious illness and their caregivers, by addressing the physical, psychosocial, spiritual, and decision-making challenges that they face [1]. Palliative care is becoming increasingly studied and accepted as a longitudinal component of care in neurologic diseases such as amyotrophic lateral sclerosis [2], multiple sclerosis [3], and Parkinson's disease [4•], although its implementation remains non-standardized. Hospice care is a component of palliative care, with a specific focus on care at the end of life, without curative intent for the life-limiting illness.

Dementia is a progressive, life-limiting condition that affects 50 million people worldwide [5]. There are currently no disease-modifying therapies available. As with other life-limiting conditions, palliative care likely has an important role to play in the care of patients with dementia. We provide an overview of recent palliative care research as it relates to dementia care and highlights knowledge gaps for further research. Additional details regarding select interventional studies are noted in Table 1.

## Recent Research

### Advance Care Planning in Dementia Care

Advance care planning (ACP) and goals of care (GOC) conversations (Box 1) are important aspects of palliative care—to prevent suffering and achieve care that is consistent with patient goals. Within dementia care, advance care planning is especially difficult because accurate prognostication is challenging and ACP conversations often do not take place early in the disease course [13], while patients are still cognitively intact. If these conversations are delayed until advanced stages of disease, due to the nature of the disease, patients will be

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**Table 1** Details on select papers

Author (year)	Study objective	Study design	Intervention	Population	Results
Freeland and Wu (2019) [6]	Review disease-specific ACP interventions (dementia-specific studies reviewed here)	Review	Dementia studies: 1. Advance care treatment plan 2. Preserving identity and planning for advance care 3. Respecting choices 4. In-person palliative care conversation	1. Caregivers of patients with advanced dementia at adult daycare 2. Patients with mild dementia and caregivers in their homes 3. Families of nursing home residents with advanced dementia 4. Families of nursing home residents with advanced dementia	Summary: 1. Increased knowledge about dementia, EOL treatment options, and confidence 2. Decreased depression, increased QOL 3. Decreased caregiver uncertainty, increased care satisfaction; non-significant increase in DNR completion and decrease in hospital admissions/deaths over 6 months 4. Increased care satisfaction and completion of MOLST form
Pieper et al. (2018) [7]	Assess the effect of STA OP! intervention for pain assessment and management as a method of decreasing difficult behaviors	Cluster RCT	Stepwise approach to identifying behavioral issues, pain/physical/affective needs assessments, followed by non-pharmacologic treatment, analgesia, and finally psychotropic medications as needed Specialty palliative care consultation during hospitalization, informational booklet about advanced dementia, two week post-discharge phone call by palliative care NP	Residents in nursing homes with psychogeriatric units ( <i>n</i> = 148 intervention, <i>n</i> = 140 control)	Low implementation (only 39% of intervention arm actually received the protocol) Intervention arm associated with lower pain observations by 6 months (by -1.54 points, 95% CI -2.82 to -0.27, <i>p</i> =0.009) and higher opioid use (OR 3.08 95% CI 1.08–8.74) but no difference in other analgesic use (OR 1.38 95% CI 0.71–2.68) No change in hospitalizations or ED visits, no difference in ratings of patient comfort Intervention arm more likely to have assessment and treatment of physical and psychiatric symptoms, more palliative care domains addressed (7.6 vs 2.7 <i>p</i> < 0.001), more likely to have spiritual needs addressed (47% vs 0%), more likely to receive hospice (25% vs 3% <i>p</i> <0.019) and community palliative care (21% vs 7% <i>p</i> =0.124), more likely to be discharged to home/assisted living rather than nursing home ( <i>p</i> = 0.046), family more likely to participate in discussion about prognosis (90% vs 3% <i>p</i> <0.001) and goals of care (90% vs 25% <i>p</i> <0.001), more likely to complete MOST in hospital (70% vs 13% <i>p</i> < 0.001) and have active MOST at 60 days (79% vs 30% <i>p</i> <0.001)
Hanson et al. (2019) [8•]	Study the effect of dementia-specific palliative care triggered by hospitalization	RCT	Facilitated case conferencing between family and nurse trained in palliative care planning to create individualized plans for residents	Nursing home residents with advanced dementia (analysis: <i>n</i> =156 FCC, <i>n</i> = 130 control)	Intervention arm more likely to have documentation of pain ( <i>p</i> =0.04), restlessness ( <i>p</i> =0.02), constipation ( <i>p</i> =0.002), skin tears ( <i>p</i> =0.005), other symptoms ( <i>p</i> <0.001), but not difficulty swallowing/eating/drinking, drowsiness, breathlessness, coughing, choking, vomiting, fear/anxiety, diarrhea, depression. Intervention arm had more frequent pain assessments (40% vs 17%, <i>p</i> =0.08) and symptom-oriented medication changes ( <i>p</i> <0.01). No significant differences on EOL scales (but likely underpowered) Intervention arm had higher scores on EOL communication (3.7 vs 3.0 <i>p</i> =0.02), greater concordance with providers (88.4% vs 71.2% <i>p</i> =0.01), more palliative care domains addressed (5.6 vs 4.7 <i>p</i> =0.02), more likely to have MOST form filled out (35% vs 16% <i>p</i> =0.05) and less likely to
Agar et al. (2017) [9]	Study the effect of facilitated case conferencing (FCC) on EOL care	Parallel cluster RCT	Facilitated case conferencing between family and nurse trained in palliative care planning to create individualized plans for residents	Nursing home residents with advanced dementia (analysis: <i>n</i> =128 GOC, <i>n</i> =127 control)	Intervention arm more likely to have documentation of pain ( <i>p</i> =0.04), restlessness ( <i>p</i> =0.02), constipation ( <i>p</i> =0.002), skin tears ( <i>p</i> =0.005), other symptoms ( <i>p</i> <0.001), but not difficulty swallowing/eating/drinking, drowsiness, breathlessness, coughing, choking, vomiting, fear/anxiety, diarrhea, depression. Intervention arm had more frequent pain assessments (40% vs 17%, <i>p</i> =0.08) and symptom-oriented medication changes ( <i>p</i> <0.01). No significant differences on EOL scales (but likely underpowered) Intervention arm had higher scores on EOL communication (3.7 vs 3.0 <i>p</i> =0.02), greater concordance with providers (88.4% vs 71.2% <i>p</i> =0.01), more palliative care domains addressed (5.6 vs 4.7 <i>p</i> =0.02), more likely to have MOST form filled out (35% vs 16% <i>p</i> =0.05) and less likely to
Hanson et al. (2017) [10•]	Study of the effect of the Goals of Care (GOC) intervention on quality of communication and goal-concordant care	Single-blind cluster RCT	18-minute GOC video decision aid and structured discussion with trained care team (generally not attended by physicians and nurse practitioners)	Nursing home residents with advanced dementia (analysis: <i>n</i> =128 GOC, <i>n</i> =127 control)	Intervention arm more likely to have documentation of pain ( <i>p</i> =0.04), restlessness ( <i>p</i> =0.02), constipation ( <i>p</i> =0.002), skin tears ( <i>p</i> =0.005), other symptoms ( <i>p</i> <0.001), but not difficulty swallowing/eating/drinking, drowsiness, breathlessness, coughing, choking, vomiting, fear/anxiety, diarrhea, depression. Intervention arm had more frequent pain assessments (40% vs 17%, <i>p</i> =0.08) and symptom-oriented medication changes ( <i>p</i> <0.01). No significant differences on EOL scales (but likely underpowered) Intervention arm had higher scores on EOL communication (3.7 vs 3.0 <i>p</i> =0.02), greater concordance with providers (88.4% vs 71.2% <i>p</i> =0.01), more palliative care domains addressed (5.6 vs 4.7 <i>p</i> =0.02), more likely to have MOST form filled out (35% vs 16% <i>p</i> =0.05) and less likely to

**Table 1** (continued)

Author (year)	Study objective	Study design	Intervention	Population	Results
Song et al. (2019) [11•]	Study the feasibility and effect of modified SPIRIT intervention (in-person and remote)	Mixed methods pilot RCT to determine feasibility and effect	60-min. psychoeducational intervention to promote preparation for EOL decision-making; aims to enable the patient to examine his/her values related to EOL decisions and enable the surrogate to understand the patient's illness experiences and values	PWD and their caregivers invited during clinic visit ( $n=12$ in person, $n=11$ remote)	<p>have hospital transfers (RR=0.47 95% CI 0.26–0.88)</p> <p>No difference in survival (HR 0.76 95% CI 0.54–1.08)</p> <p>High dyad congruence (73.9%), low patient decisional conflict (&lt;2.0), high surrogate decision-making confidence (&gt;2.0), without change post-assessment</p> <p>Feasibility: 2 remote sessions encountered technical difficulties, 1 remote session incomplete because surrogate stopped early</p> <p>4 PWD expressed emotional difficulty discussing death, 2 PWD became physically tired</p> <p>Nearly all surrogates felt the intervention was intense and emotional, but positive and comprehensive</p> <p>Most frequently stated benefit was helping the dyad be on the same page; most frequently stated challenge was the surrogate visualizing EOL for the patient</p> <p>Among PWD: Improvements in knowledge of end-stage dementia treatment (<math>t=-2.79</math>, <math>p=0.008</math>, effect size=0.5) and ACP (<math>t=-4.10</math>, <math>p&lt;0.001</math>, effect size=0.5), decreased decisional conflict (<math>t=4.76</math>, <math>p&lt;0.001</math>, effect size=0.8)</p> <p>Among caregivers: Improvements in knowledge of end-stage dementia treatment (<math>t=-4.77</math>, <math>p&lt;0.001</math>, effect size=0.8) and ACP (<math>t=-8.22</math>, <math>p&lt;0.001</math>, effect size=1.2), decreased decisional conflict (<math>t=3.89</math>, <math>p&lt;0.001</math>, effect size=0.6), decrease in negative attitudes towards ACP (<math>t=3.73</math>, <math>p=0.001</math>, effect size=0.7)</p>
Huang et al. (2020) [12•]	Assessing an ACP information intervention for patients with MCI or mild dementia and their caregivers in Taiwan	Pre- and post-intervention measurements of knowledge of dementia treatment, knowledge of ACP, ACP attitudes, decisional conflict	Informational manual provided to patients and caregivers and explained by nurse with ACP training, followed by facilitated discussions between patients and caregivers aimed towards developing ACP	Patients with MCI or mild dementia and their family caregivers recruited from outpatient clinics in teaching hospitals, dementia centers, or community care center ( $n=40$ dyads; 40 PWD, 38 caregivers)	

ACP advance care planning; EOL end of life; MOST medical orders for scope of treatment

cognitively impaired, and the conversations will instead take place with a surrogate decision maker. Pettigrew et al. [14] surveyed patients with dementia and their caregivers investigating attitudes towards ACP, and found that while basic levels of knowledge and completion of formal ACP documentation were high, at least 50% had never had a conversation with their doctor about ACP, and that there was a desire for more information about end of life, including at the time of diagnosis, and further conversations with healthcare providers. This study also found racial differences between white and African American subjects; African Americans were less likely to have formal ACP completed and were less likely to prefer comfort care at the end of life. Similarly, Armstrong et al. surveyed caregivers and friends of patients who had died with a dementia with Lewy bodies diagnosis and found that 47% had early ACP with their physicians, 60% had discussed hospice or palliative care with their physicians at some point, and only 22% had discussed what to expect at the end of life with their physician [15]. Several recent studies have looked at advance care planning interventions specifically for patients with dementia and their caregivers. Four of these studies were summarized by Freeland and Wu [6]. Of these interventions, three targeted patients with advanced dementia and therefore study interactions were held with the caregivers alone. All four interventions involved longitudinal interactions with the study team, highlighting the fact that ACP is a process. The outcomes in these studies were varied and included care satisfaction, measures of quality of life, caregiver confidence in making decisions, caregiver knowledge, and Medical Orders for Life-Sustaining Treatment (MOLST) form completion, which highlights the difficulty of measuring the efficacy of ACP.

#### Box 1: Definitions of terms

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**Advance Care Planning (ACP):** A conversational procedure focusing on illness prognosis, identifying decision surrogates, and planning for medical scenarios in the setting of serious illness when patients may not be able to decide for themselves. The focus is on elicit patient values and goals. Generally takes place over time in the outpatient setting, before a medical crisis arises

**Goals of Care (GOC):** Conversations for more urgent decision making, taking patient values and goals, as well as prior ACP conversations into account, in the face of illness progression or medical crisis; generally takes place in the inpatient setting, but can take place in the outpatient setting as the clinical picture changes.

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An additional challenge is understanding which outcomes would be indicate of effective ACP. This is relevant in dementia care but is also recognized as a challenge in ACP as a whole. To that end, a Delphi panel was convened spanning from 2013 to 2017 to identify patient-centered outcomes for ACP in any setting [16]. The most important outcome identified was care consistent with goals, which does not currently have a validated instrument to measure it, and therefore, proxy

measurements are used, as indicated in the varied outcomes in the review by Freeland and Wu [6]. This is an important limitation in both research around ACP and in clinical care. Indeed, it has been argued that effectiveness of ACP may be the wrong focus of research since its stated outcome, goal concordant care, is so difficult to achieve and measure, and to instead focus on other aspects of palliative care such as communication skills, access to palliative care, and models of care [17].

### Training Neurologists to Provide Primary Palliative Care

Palliative care delivery may be thought of as subdivided into “generalist level” or “primary” palliative care, which consists of skills and care that can be provided by the primary treating physician for the disease, and “specialty palliative care,” which is provided by palliative care specialists with formal palliative care training [18]. Given the long-standing shortage of palliative care specialists [19], the need for primary palliative care delivery is essential. Moreover, elements of primary palliative care may be felt to be meaningful and important components of comprehensive care that providers may wish to provide.

Training physicians in communication skills focused on serious illness and other palliative care skills is a relatively new concept and is not covered in a standardized manner during post-graduate medical training. Spiker et al. conducted a systematic review of studies that looked at residency and fellowship leadership attitudes towards primary palliative care skills across several specialties, and found positive attitudes towards palliative care education but frequent dissatisfaction with current curricula, as well as variability in content and delivery [20]. Back et al. summarized the negative impact that this lack of training has on both patient outcomes, such as adequate understanding of information, as well as physician factors such as burnout [21]. Indeed, in a survey of neurologists and neurology residents in the Netherlands, 57% of respondents indicated that they felt the need for training to effectively conduct conversations around treatment restrictions in progressive neurologic diseases such as high-grade glioma, Parkinson’s disease, and multiple sclerosis [22]. Mehta et al. demonstrated in a survey of neurology program directors in the USA that among palliative care domains, the domain of communication skills was felt to be among the best of residents’ skills; however, the most commonly used method of education (conferences/seminars) was among the least effective [23]. Being able to effectively communicate diagnosis, prognosis, and care preferences is particularly important in dementia care, in which there is a “window of opportunity” to involve patients in their own care before they lose capacity. How to optimize training in this area for neurologists and neurology trainees is an important research gap. Training tools

such as VitalTalk and the Serious Illness Care Program may be potential interventions [21] and have been evaluated in many medical specialties [24] and training programs [25, 26]; however, these have not been studied in neurologists or dementia specific programs.

### Non-cognitive Symptom Management

Managing the psychological and psychiatric symptoms of a serious illness is one of the eight domains of palliative care [27]. Behavioral symptoms are highly prevalent in dementia and have a significant impact on quality of life for caregivers [28]. Treating these symptoms is difficult and there are few new medication options. The one notable new medication has been pimavanserin, which is a selective 5-HT<sub>2A</sub> receptor inverse agonist and antagonist that was approved by the FDA for non-demented Parkinson's disease patients with psychosis in 2016. It is novel as it is in a different medication class from other antipsychotics, which generally target the dopamine system. It was quickly moved into clinical trials for psychosis due to Alzheimer's disease, and a phase II trial demonstrated a significant reduction in psychosis over 6 weeks and improvement in irritability/lability. However, this benefit was more notable in participants with more severe symptoms, and was not maintained over the 12-week duration of the trial [29]. The HARMONY trial, a phase III trial studying pimavanserin for the treatment of dementia-related psychosis, including patients with Alzheimer's disease, dementia with Lewy bodies, frontotemporal dementia, and vascular dementia, was completed in early 2020 with results suggesting a 2.8-fold reduction in risk for psychosis relapse [30]. A supplemental new drug application was submitted to the FDA for the treatment of delusions and hallucinations in dementia-related psychosis, with a decision expected in April 2021 [31].

The favored approach to neuropsychiatric symptoms in dementia is traditionally to attempt non-pharmacologic and environmental modification approaches first and to then use pharmacologic approaches if the first approach fails. A modified Delphi panel was convened in 2015 to address the treatment of these difficult symptoms with regard to Alzheimer's disease and largely reaffirmed this approach [32]. The favored initial pharmacologic strategies for agitation were citalopram and ensuring adequate pain management, whereas for psychosis the favored pharmacologic strategy was risperidone. It is unclear if the panel was considering these treatments in patients already receiving cholinesterase inhibitors for primary treatment of Alzheimer's disease. Additionally, the favored non-pharmacologic strategies were the DICE (describe, investigate, create, and evaluate) intervention, which is a structured method of assessing underlying causes and providing treatment and monitoring and music therapy [32].

Adequate pain management is also important in dementia care as patients with dementia may have difficulty expressing

their symptoms, which can lead to undertreatment and also contribute to behavioral symptoms. The European Academy of Neurology as part of a recent guideline issued a recommendation, based on limited and weak data, to consider routine use of mild analgesics after other potential causes of behavioral symptoms have been ruled out. Further research is warranted into this area [33]. Pieper et al. examined the effect of stepwise pain assessment and management as a means of decreasing behavioral symptoms and found that despite low implementation of the intervention there were significantly lower pain observations by 6 months in the intervention arm. They also found higher opioid use, but not other analgesic use [7].

### Unmet Palliative Care Needs at the End of Life

As diseases progress and patients near terminal stages of disease, palliative care needs tend to increase and when appropriate, as deemed by the treating provider, receive hospice care to best manage the end of life. This is no different in patients with dementia; however, there are important differences in hospice usage among patients with dementia care when compared with other conditions. Epstein-Lubow et al. [34] and Wilkins et al. [35] looked at hospice referral rates for patients with advanced dementia who were admitted to inpatient psychiatric units and then died within 30 [34] or 90 [35] days from discharge. Both studies found a referral rate of less than 10% [34, 35]. In contrast, Brody et al. demonstrated that among patients who died within 30 days of discharge from hospitalization for acute reasons, 32.4% had been discharged to hospice even without a palliative care consultation [36], suggesting that estimations of prognosis are likely more accurate among non-dementia diseases. De Vleminck et al. studied Medicare beneficiaries enrolled in hospice and demonstrated that patients with a primary diagnosis of dementia have significantly longer stays in hospice compared to patients with a non-dementia primary diagnosis, as well as longer survival and increased likelihood of hospice disenrollment after a long stay [37], suggesting that hospice referral criteria may not adequately characterize end of life in dementia. Additionally, a study of registry data from patients who received consultation from a community-based palliative care organization demonstrated that patients with dementia tended to be older, more debilitated, and are often already hospice eligible by the time they first saw a palliative care specialist when compared to patients with non-dementia diagnoses [38]. To try to identify ways of improving access to palliative care, Hanson et al. studied the effect of triggered palliative care consultation for patients with advanced dementia who were hospitalized for any acute reason. They found that while there were no differences in hospitalizations or ED visits or in ratings of patient comfort, triggered palliative care consultations did increase the likelihood of patients receiving hospice or community palliative care, more family engagement in

prognosis and GOC conversations and more palliative care needs were addressed [8•], suggesting that palliative care involvement assisted in making hospice referrals and ongoing prognosis and GOC conversations.

When it comes to actual end of life care, Martinsson et al. studied the quality of end of life care in Sweden for patients with dementia compared data from deceased patients with dementia and compared it to data from deceased patients with cancer. The study demonstrated that those patients were significantly less likely to receive interventions such as specialized palliative care consultation (OR 0.059,  $p < 0.001$ ), caregiver support (OR 0.693,  $p < 0.001$ ), and PRN prescription orders for pain (OR 0.590,  $p < 0.001$ ) and anxiety (OR 0.609,  $p < 0.001$ ) when compared to patients with cancer [39]. Of note, in this study, patients with dementia were less likely to have pressure ulcers (0.579,  $p < 0.001$ ) and less likely to have received enteral or intravenous fluids in the last 24 h of life (0.326,  $p < 0.001$ ), demonstrating some variability in the measures of care that received attention.

To try to improve end of life care, Agar et al. studied the effect of facilitated case conferencing between family members of nursing home residents with advanced dementia and staff nurses trained in palliative care planning, with the goal of creating individualized plans for residents. They found that those who received this intervention were more likely to have symptom documentation, more pain assessments, and more symptom-oriented treatments. There was also a trend towards higher care satisfaction from families. Notably, there was no significant change on the primary outcome, end of life scales, but in the study, fewer patients than expected died during the study period, resulting in an underpowered analysis [9]. To improve quality of communication towards end of life, Hanson et al. studied the goals of care (GOC) intervention, which is a video decision aid for family members of nursing home residents with advanced dementia followed by structured discussions with trained care team members (generally not physicians or nurse practitioners), on quality of communication and measures of goal-concordant care. They found that those who received the intervention had greater concordance with providers, were more likely to have a MOLST form filled out, and had higher scores on measures of end of life communication. There was no difference in survival [10•]. Research gaps that remain to be explored are alternative hospice eligibility criteria for patients with dementia and ways of supporting the care of patients dying with dementia at home.

## Remaining Gaps

### Prognostication

Disease prognosis and its discussion are significant components of dementia care and are essential to ACP and GOC

conversations. Many challenges, however, exist in the discussion of disease prognosis in dementia. While dementia due to neurodegenerative disease is inherently progressive, and therefore, the overall end point of mortality is known, beyond that the ability of clinicians to provide prognosis for individual patients is somewhat limited because the knowledge of features that may implicate a faster prognosis is limited. Prominent and early psychiatric symptoms and extrapyramidal signs have been demonstrated to predict faster decline and mortality in Alzheimer's disease in several studies [40, 41]. Adverse predictive factors in other dementias such as dementia with Lewy bodies (DLB) or frontotemporal dementia (FTD) are much less well understood, although Santacruz Escudero et al. study demonstrated that more severe neuropsychiatric symptoms are associated with faster decline in FTD as well [42]. Notably, while DLB progresses faster than AD [43], a study looking at the question of predictive symptoms in DLB and AD did not find that baseline neuropsychiatric symptoms predicted decline in DLB, although the presence of neuropsychiatric symptoms over time was associated with decline [44].

Even towards the end of life, it can be difficult to estimate disease prognosis, as demonstrated by high median length of stay in hospices for patients with a primary diagnosis of dementia [37]. One area of research to address this important gap is individualized predictive models for patients particularly with Alzheimer's disease [45]. Improvement in prognostication is important for counseling, planning for the future, and optimizing referral pathways for hospice.

### Timing of Palliative Care Interventions

Studies have demonstrated that early palliative care interventions can have positive benefits on quality of life and care satisfaction [46] and even mortality [47] in patients with advanced cancer. Whether this translates to dementia remains unknown. An additional consideration is that, with regard to dementia specifically, early ACP and GOC conversations have the potential to optimize patient agency and autonomy by allowing the patients themselves to participate in the intervention before they lose decisional capacity. Most of the existing research on palliative care and dementia to date has focused on advanced dementia, and much less has been done to date looking at palliative care interventions in mild dementia. Song et al. looked at an ACP intervention entitled SPIRIT (sharing patient's illness representation to increase trust), which focuses on fostering conversations, between 23 patients with mild-moderate dementia and their surrogates regarding ACP decisions so that the patients can participate meaningfully in the process. They found that it enabled meaningful engagement in ACP discussions when implemented both in-person and remotely. Congruence between patients and caregivers was high at baseline and did not change after the

intervention; however, this was likely limited by small numbers in the study [11, 48]. Similarly, Huang et al. assessed an informational intervention consisting of an informational manual followed by facilitated discussion for patients with MCI or mild dementia and their caregivers in Taiwan and found improvement on measures of knowledge and decisional conflict, as well as decreased negative caregiver attitudes towards ACP [12]. Neither of these studies measured outcomes such as MOLST form completion. Primary palliative care is likely to play an important role in earlier palliative care interventions, highlighting the importance of training clinicians such as neurologists in primary palliative care skills, as well as education regarding the Medicare pay structures for conducting and documenting advance care planning for patients with cognitive impairment, which was started in 2017 [49]. Future research is much needed to assess the impact of palliative care in mild dementia, as well as in genetic causes of dementia that can be identified pre-symptomatically, to identify the optimal timing for interventions such as ACP conversations and structured needs assessments.

### Dyadic Relationships

The dyadic relationship between dementia patients and their caregivers has implications for both patient and caregiver outcomes. Strain in the dyadic relationship has been associated with negative caregiver self-perceptions of health, increased caregiver depression, increased caregiver report of caregiving difficulties, and increased discrepancy within the dyad regarding perception of caregiving difficulties [50]. Dufournet et al. demonstrated that between 38 and 43% of nursing home placements were attributable to caregiver stress, in contrast to 12–16% attributable to neuropsychiatric symptoms and 20–25% attributable to cognitive impairment [51]. Additionally, several studies have demonstrated that caregiving has objective cognitive and physiological implications for caregivers. Vitaliano et al. demonstrated that caregivers have increased cognitive difficulties, both subjective and objective, and that objective difficulties continue to worsen over time [52]. Correa et al. looked at whether the chronic stress of caregiving produces the same effects on younger (i.e., patients' children) compared with older caregivers. They found that objective difficulties were present among young caregivers, although to a lesser degree compared with older caregivers, as well as alterations in levels of cortisol in both groups, alteration in brain-derived neurotrophic factor (BDNF) for younger caregivers, and alterations in dehydroepiandrosterone (DHEA) in older caregivers. This has implications for their long-term health and functioning after care recipients have died [53]. Vick et al. looked at measures of caregiver strain from national surveys and found that caregivers for dementia patients were approximately twice as likely to experience high amounts of caregiver strain compared to

caregivers for patients without dementia (adjusted OR 1.67; 95% CI 1.26–2.22), with the association becoming stronger for those caring for a patient with dementia towards end of life (adjusted OR 1.94; 95% CI 1.10–3.45) [54]. This would be anticipated to be amplified in young-onset dementia due to loss of income in patient and caregiver. It has been suggested that poor self-reported health as well as increased stress responses among caregivers may be driven by poor emotion recognition among patients as well, to a lesser degree, decreased ability to react to emotions among patients [55]. However, a randomized controlled trial designed to test the powerful tools for caregivers intervention to reduce caregiver stress demonstrated efficacy in reducing caregiver stress and depressive symptoms but not self-rated health [56]. Further research is needed to identify methods to mitigate adverse health effects of caregiving.

### Conclusions

Dementia is a prevalent, progressive, and life-limiting condition affecting millions of people. Palliative care interventions are an important and increasingly recognized component of care for other life-limiting conditions. These interventions are becoming recognized in dementia care as well, with several recent studies looking at models of ACP delivery for patients with dementia, identifying predictors of decline, and advances in treating non-cognitive symptoms. However, research gaps exist, including optimal timing and types of palliative care interventions, primary palliative care education, prognostication, and better understanding the dyadic relationship of caregiver and dementia patient, to improve outcomes for both. Further research in these areas will provide methods for further optimizing dementia care.

### Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no conflict of interest.

### References

Papers of particular interest, published recently, have been highlighted as:

- Of importance
- Of major importance

1. WHO. Palliative Care Fact Sheet 2018 [Available from: <https://www.who.int/news-room/fact-sheets/detail/palliative-care>. Accessed 05/07/2020.
2. Oliver DJ. Palliative care in motor neurone disease: where are we now? *Palliat Care*. 2019;12:1178224218813914.

3. Buecken R, Galushko M, Golla H, Strupp J, Hahn M, Ernstmann N, et al. Patients feeling severely affected by multiple sclerosis: how do patients want to communicate about end-of-life issues? *Patient Educ Couns*. 2012;88(2):318–24.
4. Kluger BM, Miyasaki J, Katz M, Galifianakis N, Hall K, Pantilat S, et al. Comparison of integrated outpatient palliative care with standard care in patients with Parkinson disease and related disorders: a randomized clinical trial. *JAMA Neurol*. 2020;77(5):551–560. **First Pragmatic RCT of Integrated Palliative Care in Parkinson Disease.**
5. WHO. Dementia Fact Sheet 2019 [Available from: <https://www.who.int/news-room/fact-sheets/detail/dementia>. Accessed 08/10/2020.
6. Freeland DG, Wu DS. Disease-specific advance care planning interventions for older adults. *Current Geriatrics Reports*. 2019;8:12–20.
7. Pieper MJC, van der Steen JT, Francke AL, Scherder EJA, Twisk JWR, Achterberg WP. Effects on pain of a stepwise multidisciplinary intervention (STA OP!) that targets pain and behavior in advanced dementia: a cluster randomized controlled trial. *Palliat Med*. 2018;32(3):682–92.
8. Hanson LC, Kistler CE, Lavin K, Gabriel SL, Ernecoff NC, Lin FC, et al. Triggered palliative care for late-stage dementia: a pilot randomized trial. *J Pain Symptom Manage*. 2019;57(1):10–9. **Pilot RCT of triggered palliative care consultation for patients with advanced dementia hospitalized for any acute reason.**
9. Agar M, Luckett T, Luscombe G, Phillips J, Beattie E, Pond D, et al. Effects of facilitated family case conferencing for advanced dementia: a cluster randomised clinical trial. *PLoS One*. 2017;12(8):e0181020.
10. Hanson LC, Zimmerman S, Song MK, Lin FC, Rosemond C, Carey TS, et al. Effect of the goals of care intervention for advanced dementia: a randomized clinical trial. *JAMA Intern Med*. 2017;177(1):24–31 **RCT of GOC decision aid intervention for nursing home residents with advanced dementia.**
11. Song MK, Ward SE, Hepburn K, Paul S, Kim H, Shah RC, et al. Can persons with dementia meaningfully participate in advance care planning discussions? A mixed-methods study of SPIRIT. *J Palliat Med*. 2019;22(11):1410–6 **Mixed methods pilot RCT of advance care planning intervention study in mild dementia.**
12. Huang HL, Lu WR, Liu CL, Chang HJ. Advance care planning information intervention for persons with mild dementia and their family caregivers: impact on end-of-life care decision conflicts. *PLoS One*. 2020;15(10):e0240684 **Advance care planning intervention study in mild dementia in Taiwan.**
13. Garand L, Dew MA, Lingler JH, DeKosky ST. Incidence and predictors of advance care planning among persons with cognitive impairment. *Am J Geriatr Psychiatry*. 2011;19(8):712–20.
14. Pettigrew C, Brichko R, Black B, O'Connor MK, Austrom MG, Robinson MT, et al. Attitudes toward advance care planning among persons with dementia and their caregivers. *Int Psychogeriatr*. 2019 Jul 16;1-15. **Large study of attitudes towards ACP among PWD and their caregivers.**
15. Armstrong MJ, Alliance S, Corsentino P, DeKosky ST, Taylor A. Cause of death and end-of-life experiences in individuals with dementia with Lewy bodies. *J Am Geriatr Soc*. 2019;67(1):67–73.
16. Sudore RL, Heyland DK, Lum HD, Rietjens JAC, Korfage IJ, Ritchie CS, et al. Outcomes that define successful advance care planning: a Delphi panel consensus. *J Pain Symptom Manage*. 2018;55(2):245–55 e8 **Delphi panel defining ACP outcomes.**
17. Morrison R. Advance directives/care planning: clear, simple, and wrong. *J Palliat Med*. 2020;23(7):878–9.
18. Quill TE, Abernethy AP. Generalist plus specialist palliative care — creating a more sustainable model. *New England J Med*. 2013;368(13):1173–5.
19. Lupu D. American Academy of H, Palliative Medicine Workforce Task F. Estimate of current hospice and palliative medicine physician workforce shortage. *J Pain Symptom Manage*. 2010;40(6):899–911.
20. Spiker M, Paulsen K, Mehta AK. Primary palliative care education in U.S. residencies and fellowships: a systematic review of program leadership perspectives. *J Palliat Med*. 2020;23(10):1392–9 **Systematic review of attitudes towards primary palliative care training among post-graduate training directors across specialties.**
21. Back AL, Fromme EK, Meier DE. Training clinicians with communication skills needed to match medical treatments to patient values. *J Am Geriatr Soc*. 2019;67(S2):S435–S41.
22. Walter HAW, Seeber AA, Willems DL, de Visser M. The role of palliative care in chronic progressive neurological diseases—a survey amongst neurologists in the Netherlands. *Front Neurol*. 2018;9:1157.
23. Mehta AK, Najjar S, May N, Shah B, Blackhall L. A needs assessment of palliative care education among the United States adult neurology residency programs. *J Palliat Med*. 2018;21(10):1448–57.
24. Paladino J, Kilpatrick L, O'Connor N, Prabhakar R, Kennedy A, Neal BJ, et al. Training clinicians in serious illness communication using a structured guide: evaluation of a training program in three health systems. *J Palliat Med*. 2020;23(3):337–45.
25. Chung EH, Truong T, Jooste KR, Fischer JE, Davidson BA. The Implementation of communication didactics for OB/GYN residents on the disclosure of adverse perioperative events. *J Surg Educ*. 2020. <https://doi.org/10.1016/j.jsurg.2020.09.001>.
26. Nakagawa S, Fischkoff K, Berlin A, Arnell TD, Blinderman CD. Communication skills training for general surgery residents. *J Surg Educ*. 2019;76(5):1223–30.
27. National Consensus Project for Quality Palliative Care. Clinical practice guidelines for quality palliative care, 4th Ed. Richmond, VA: National Coalition for Hospice and Palliative Care; 2018 [Available from: [https://www.nationalcoalitionhpc.org/wp-content/uploads/2020/07/NCHPC-NCPGuidelines\\_4thED\\_web\\_FINAL.pdf](https://www.nationalcoalitionhpc.org/wp-content/uploads/2020/07/NCHPC-NCPGuidelines_4thED_web_FINAL.pdf). Accessed 12/01/2020.
28. Black W, Almeida OP. A systematic review of the association between the behavioral and psychological symptoms of dementia and burden of care. *Int Psychogeriatr*. 2004;16(3):295–315.
29. Ballard C, Banister C, Khan Z, Cummings J, Demos G, Coate B, et al. Evaluation of the safety, tolerability, and efficacy of pimavanserin versus placebo in patients with Alzheimer's disease psychosis: a phase 2, randomised, placebo-controlled, double-blind study. *Lancet Neurol*. 2018;17(3):213–22.
30. Yunusa I, El Helou ML, Alsaahli S. Pimavanserin: a novel antipsychotic with potentials to address an unmet need of older adults with dementia-related psychosis. *Front Pharmacol*. 2020;11:87 **Overview of the pharmacology and potential utility of pimavanserin.**
31. Acadia Pharmaceuticals. ACADIA pharmaceuticals announces U.S. FDA accepted for filing the supplemental new drug application for NUPLAZID® (pimavanserin) for the treatment of hallucinations and delusions associated with dementia-related psychosis 2020 [Available from: [https://ir.acadia-pharm.com/news-releases/news-release-details/acadia-pharmaceuticals-announces-us-fda-accepted-filing?field\\_nir\\_news\\_date\\_value%5Bmin%5D=&field\\_nir\\_news\\_date\\_value%5Bmax%5D=](https://ir.acadia-pharm.com/news-releases/news-release-details/acadia-pharmaceuticals-announces-us-fda-accepted-filing?field_nir_news_date_value%5Bmin%5D=&field_nir_news_date_value%5Bmax%5D=). Accessed 11/19/2020.
32. Kales HC, Lyketsos CG, Miller EM, Ballard C. Management of behavioral and psychological symptoms in people with Alzheimer's disease: an international Delphi consensus. *Int Psychogeriatr*. 2019;31(1):83–90.
33. Frederiksen KS, Cooper C, Frisoni GB, Frolich L, Georges J, Kramerberger MG, et al. A European Academy of Neurology guideline on medical management issues in dementia. *Eur J Neurol*. 2018;27:1805–1820.



34. Epstein-Lubow G, Fulton AT, Marino LJ, Teno J. Hospice referral after inpatient psychiatric treatment of individuals with advanced dementia from a nursing home. *Am J Hosp Palliat Care*. 2015;32(4):437–9.
35. Wilkins JM, Goldstein EK, Forester BP. Characteristics of hospice referrals from an inpatient geriatric psychiatry unit. *Am J Geriatr Psychiatry*. 2019;27(2):162–6.
36. Brody AA, Ciemins E, Newman J, Harrington C. The effects of an inpatient palliative care team on discharge disposition. *J Palliat Med*. 2010;13(5):541–8.
37. De Vleminck A, Morrison RS, Meier DE, Aldridge MD. Hospice care for patients with dementia in the United States: a longitudinal cohort study. *J Am Med Dir Assoc*. 2018;19(7):633–8.
38. Harrison KL, Bull JH, Garrett SB, Bonsignore L, Bice T, Hanson LC, et al. Community-based palliative care consultations: comparing dementia to nondementia serious illnesses. *J Palliat Med* 2020;23(8):1021-1029.
39. Martinsson L, Lundstrom S, Sundelof J. Quality of end-of-life care in patients with dementia compared to patients with cancer: a population-based register study. *PLoS One*. 2018;13(7):e0201051.
40. Scarmeas N, Albert M, Brandt J, Blacker D, Hadjigeorgiou G, Papadimitriou A, et al. Motor signs predict poor outcomes in Alzheimer disease. *Neurology*. 2005;64(10):1696–703.
41. Scarmeas N, Brandt J, Albert M, et al. Delusions and hallucinations are associated with worse outcome in Alzheimer disease. *Arch Neurol*. 2005;62(10):1601–8.
42. Santacruz Escudero JM, Beltran J, Palacios A, Chimbi CM, Matallana D, Reyes P, et al. Neuropsychiatric symptoms as predictors of clinical course in neurodegeneration. A longitudinal study. *Front Aging Neurosci*. 2019;11:176.
43. Williams MM, Xiong C, Morris JC, Galvin JE. Survival and mortality differences between dementia with Lewy bodies vs Alzheimer disease. *Neurology*. 2006;67(11):1935–41.
44. Borda MG, Aarsland D, Tovar-Rios DA, Giil LM, Ballard C, Gonzalez MC, et al. Neuropsychiatric symptoms and functional decline in Alzheimer's disease and Lewy body dementia. *J Am Geriatr Soc*. 2020;68(10):2257-2263.
45. Stallard E, Kinoshian B, Stern Y. Personalized predictive modeling for patients with Alzheimer's disease using an extension of Sullivan's life table model. *Alzheimers Res Ther*. 2017;9(1):75.
46. Hannon B, Swami N, Rodin G, Pope A, Zimmermann C. Experiences of patients and caregivers with early palliative care: a qualitative study. *Palliat Med*. 2017;31(1):72–81.
47. Temel JS, Greer JA, Muzikansky A, Gallagher ER, Admane S, Jackson VA, et al. Early palliative care for patients with metastatic non-small-cell lung cancer. *N Engl J Med*. 2010;363(8):733–42.
48. Song MK, Ward SE, Hepburn K, Paul S, Shah RC, Morhardt DJ. SPIRIT advance care planning intervention in early stage dementias: an NIH stage I behavioral intervention development trial. *Contemp Clin Trials*. 2018;71:55–62.
49. deLima TJ, Sanchez-Reilly S, Bernacki R, O'Neill L, Morrison LJ, Kapo J, et al. Advance care planning in cognitively impaired older adults. *J Am Geriatr Soc*. 2018;66(8):1469–74.
50. Lyons KS, Zarit SH, Sayer AG, Whitlatch CJ. Caregiving as a dyadic process: perspectives from caregiver and receiver. *J Gerontol B Psychol Sci Soc Sci*. 2002;57(3):P195-204.
51. Dufournet M, Dauphinot V, Moutet C, Verdurand M, Delphin-Combe F, Krolak-Salmon P, et al. Impact of cognitive, functional, behavioral disorders, and caregiver burden on the risk of nursing home placement. *J Am Med Dir Assoc*. 2019;20(10):1254–62.
52. Vitaliano PP, Ustundag O, Borson S. Objective and subjective cognitive problems among caregivers and matched non-caregivers. *Gerontologist*. 2017;57(4):637–47.
53. Correa MS, Giacobbo BL, Vedovelli K, Lima DB, Ferrari P, Argimon II, et al. Age effects on cognitive and physiological parameters in familial caregivers of Alzheimer's disease patients. *PLoS One*. 2016;11(10):e0162619.
54. Vick JB, Ormstein KA, Szanton SL, Dy SM, Wolff JL. Does caregiving strain increase as patients with and without dementia approach the end of life? *J Pain Symptom Manage*. 2019;57(2):199–208 e2.
55. Brown CL, Wells JL, Hua AY, Chen KH, Merrilees J, Miller BL, et al. Emotion recognition and reactivity in persons with neurodegenerative disease are differentially associated with caregiver health. *Gerontologist*. 2020;60(7):1233–43.
56. • Terracciano A, Artese A, Yeh J, Edgerton L, Granville L, Aschwanden D, et al. Effectiveness of powerful tools for caregivers on caregiver burden and on care recipient behavioral and psychological symptoms of dementia: a randomized controlled trial. *J Am Med Dir Assoc*. 2020;21(8):1121-7 e1 **RCT targeting caregiver burden and patient symptoms.**

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