Top Lang Disorders
Vol. 37, No. 4, pp. 361-374

Person-Centered Memory and Communication Strategies for Adults With Dementia

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The increasing incidence of aging adults with cognitive-communication impairments and demand for services that enhance the quality of life of this population necessitates examination of the evidence-based strategies that hold the most promise in producing desired quality-of-life outcomes. The adoption of person-centered care approaches in health care (Kitwood, 1997) allows for a better understanding of how to include the person with cognitive-communication impairment in the process of identifying communication needs, developing intervention approaches, and modifying strategies as needs change. The continuum of dementia severity and the cognitive-communication characteristics at each stage are outlined as a guide for selecting compensatory communication supports to fit changing needs. Environmental features and the training of caregivers are important components of a person-centered care model that aims to ensure that individuals with dementia are respected and can live fulfilling lives. **Key words:** *communication*, *dementia*, *memory aids*, *person-centered care*

As the incidence of dementia increases worldwide, and the effects on communication of the degenerative diseases of dementia become better recognized, the need for appropriate, person-centered, and meaningful supports to ensure the best quality of life possible for individuals with cognitive-communication challenges is critical (Alzheimer's Association, 2016). The person-centered care movement (Kitwood, 1997) has highlighted the need to adopt an approach to the assessment and treatment of cognitive-communication disorders of older adults that differs from the typical impairment-focused approaches of years past (Bourgeois, Brush, Douglas, Khayum, & Rogalski, 2016a). Person-centered care focuses on the whole person, not only the disease. This approach, when paired with compensatory techniques, capitalizes on an individual's remaining functional, emotional, and cognitive abilities. Furthermore, person-centered care takes into account aspects of the individual's family, marriage, culture, and gender when designing care (Epp, 2003).

Similarly, the life participation approach (Chapey et al., 2000) to aphasia treatment has underscored the importance of finding compensatory strategies for language impairments, with a focus on engaging individuals meaningfully in desired life situations. Both of these approaches reflect the intent of the World Health Organization's International Classification of Functioning, Disability, and Health (World Health Organization, 2001) to broaden the understanding of the effects of medical conditions on individuals and their participation in life situations.

To be truly person centered, professionals must involve the individual with

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The authors have indicated that they have no financial and no nonfinancial relationships to disclose.

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DOI: 10.1097/TLD.0000000000000136

dementia in all aspects of care, from simple choices about what to wear or eat, and what activities to participate in, to more complex decisions about advance care directives and choice of health care surrogate. Considering the ever-progressing cognitive decline in dementia, family and professional caregivers may be challenged to involve clients in such aspects of their care when they are unaware of appropriate strategies to facilitate a functional communication exchange.

Professionals working with dementia need to identify, implement, and then train caregivers to use supportive and personalized compensatory cognitive-communication strategies that emphasize respect, dignity, and personally relevant treatment outcomes. This process and this article begin with consideration of cognitive-communication strengths and weaknesses across the continuum of the disease, ranging from mild to major neurocognitive disorder (American Psychiatric Association, 2013), and how needs may vary with different forms of the disorder. Then, evidence-based approaches for facilitating functional cognitive-communication behaviors in individuals across the continuum of dementia are described. Throughout the article, the focus remains on maintaining a person-centered approach to decision-making.

THE CONTINUUM OF COGNITIVE-COMMUNICATION DEFICITS

Neurocognitive disorders

According to the *Diagnostic and Statistical Manual of Mental Disorders,* 5th edition (*DSM-5*; American Psychiatric Association, 2013), neurocognitive disorders are acquired cognitive impairments for which an underlying brain pathology can potentially be determined. Neurocognitive disorders are classified on a continuum from mild to major impairments and the etiology determines the subtypes (e.g., neurocognitive disorder due to traumatic brain injury or to Alzheimer's disease). The general term *dementia* is included within the classification of major neurocognitive disorder; however, it is not an etiological subtype. Mild and major neurocognitive disorders are differentiated by diagnostic criteria for cognitive and functional impairment. Cognitive decline must be evident in one or more of six cognitive domains (i.e., complex attention, executive function, learning and memory, language, perceptual-motor, or social cognition) and not be due to delirium or other psychiatric conditions. The cognitive decline must be of concern to the individual and/or family and friends, and documented on objective, performance-based measures. Individuals with major neurocognitive disorder must have evidence of significant cognitive decline in one or more of the previously named cognitive domains, and the impairment must interfere with the ability to complete activities of daily living independently. Individuals with mild neurocognitive disorder must have evidence of modest cognitive decline in one or more of the six domains, but these deficits do not limit their independence with activities of daily living.

Mild neurocognitive disorder due to Alzheimer's disease

Mild neurocognitive disorder, formerly known as mild cognitive impairment, is indicated by cognitive deficits in one or more domains and difficulties performing complex tasks, but social and occupational functioning are not significantly affected (Albert et al., 2011). Mild neurocognitive disorder due to Alzheimer's disease is often considered a transitional diagnosis between healthy aging and dementia (i.e., major neurocognitive disorder), but not all individuals with a diagnosis of mild neurocognitive disorder will progress to a diagnosis of major neurocognitive disorder (Rivas-Vazquez, Mendez, Rey, & Carrazana, 2004).

These individuals can use compensatory cognitive-communication strategies to maintain independence and to complete complex activities of daily living with adequate speed and efficiency (Kinsella et al., 2009). For example, Bourgeois, Brush, Elliot, and Kelly (2015) reported the successful use of planners for appointment keeping when individuals with mild neurocognitive disorder who expressed concerns regarding missed appointments were trained to incorporate reviewing their planner at routine times.

Major neurocognitive disorder due to Alzheimer's disease

Major neurocognitive disorder due to Alzheimer's disease is often described across a continuum (mild, moderate, and severe) of cognitive and functional impairments. Memory impairments are often the first reported symptom of dementia (i.e., major neurocognitive disorder) due to Alzheimer's disease. This may present as difficulty remembering important dates, appointments or names of familiar people, getting lost in familiar locations, and repeating questions. In addition, individuals during the mild stage demonstrate lapses in attention, concentration, and limited executive functioning skills. As a result, everyday functioning is affected and changes become noticeable within language and communication behaviors, such as word finding and naming difficulties during conversation (Bourgeois & Hickey, 2009). Compensatory strategies (e.g., pictures paired with text) are an effective method for supporting semantic memory and word-finding skills to improve the overall flow of conversation (Bourgeois, 1990). Teaching these strategies early in the disease may help enhance independence and overall quality of life. In addition, it is important to promote continued use of compensatory strategies as the disease progresses.

In the moderate stage of neurocognitive disorder due to Alzheimer's disease, expressive language deficits (e.g., word-finding and topic maintenance) are increasingly present, associated with declines in semantic memory (Smith et al., 2011). Auditory comprehension, declarative memory, executive function, and attention also show increased decline (Bourgeois & Hickey, 2009). Strengths at this stage, however, often include preserved phonology and syntax, oral reading ability, recognition of familiar places and persons, and automatic and procedural memory abilities (Bourgeois, 2002).

As individuals progress into the severe stages of neurocognitive disorder due to Alzheimer's disease, verbal communication declines significantly to ambiguous utterances, even muteness. Individuals exhibit decreased recognition of family and increased repetitive behaviors (Bourgeois, 2002; Brandt & Rich, 1995). Individuals in the severe stage still have notable strengths, however, such as appropriate affective responses (e.g., smiling) to sensory stimuli and music, cooperation with appropriate cues, and the desire for social interaction (Bourgeois & Hickey, 2009).

When working with individuals who meet criteria for major neurocognitive disorder and are in the moderate to severe stages, it is important that professionals hold strong to the value of strengths-based, person-centered interventions. Individuals with dementia maintain the desire to be successful, to have purpose, and to communicate well into the advanced stages of the disease (Bourgeois et al., 2016a). Appropriate cueing (Small & Gutman, 2002) and communication strategies can help individuals maintain a sense of control and social connectedness across the continuum of the disease.

Primary progressive aphasia

According to the *DSM-5* (American Psychiatric Association, 2013), primary progressive aphasia, which involves frontotemporal lobar degeneration, is included within the criteria for both mild and major neurocognitive disorders. In addition to meeting the diagnostic criteria for mild or major neurocognitive disorder, the impairment onset must be gradual, include a behavioral or language variant, and not be better explained by another category of neurocognitive disorder. Individuals with primary progressive aphasia exhibit a decline in expressive or receptive language; therefore, primary progressive aphasia may also be known as a language-based dementia. These language deficits may impact activities of daily living, such as ordering at a restaurant or communicating via the telephone. As the disease progresses, individuals experience problems with other cognitive domains, such as memory (Gorno-Tempini et al., 2011).

Three clinical variants of primary progressive aphasia, each with specific strengths and weaknesses, are described in terms of receptive language, expressive language, and motor speech abilities (Gorno-Tempini et al., 2011). The diagnostic criterion for the *nonfluent* variant includes agrammatism, impaired comprehension of complex sentences but with relatively spared single-word comprehension, and motor speech deficits. In contrast, the *semantic* variant is characterized by deficits in word comprehension and confrontation naming, with relatively spared repetition and speech production. Finally, the *logopenic* variant includes impairment in comprehension of longer complex sentences, phonological errors and word retrieval deficits, but with spared object knowledge.

Because of the complexity of language deficits in primary progressive aphasia, individuals can benefit from a variety of cognitive-communication strategies to communicate their basic wants and needs in the most effective way for as long as possible (Khayum, Wieneke, Rogalski, Robinson, & O'Hara, 2012). Cognitive-communication strategies (e.g., communication book) should be incorporated early into primary progressive aphasia treatment regardless of the variant (Beukelman & Mirenda, 2013). Although people with primary progressive aphasia may benefit from support strategies as they decline in functioning, restorative treatments can be beneficial in the early stages of the disease (Hinshelwood & Henry, 2016). Treatment for these individuals must be proactive and prepare caregivers to support communication as the disease progresses (Beukelman, Fager, Ball, & Dietz, 2007).

COGNITIVE-COMMUNICATION STRATEGIES

Over the course of progression from minor to major neurocognitive disorder due to Alzheimer's disease or to frontotemporal lobar degeneration (i.e., primary progressive aphasia), neural pathways that once supported fluent cognitive-communication processes (e.g., word retrieval in conversation) begin to deteriorate (Bourgeois & Hickey, 2009). Thus, the theory is that compensatory strategies are useful because they provide alternative access routes to retrieving stored information, thereby reducing the burden on impaired cognitive processes, and making it possible to retain functions longer than otherwise would be possible.

External strategies

"External strategies" is a term that refers to an evidence-based compensatory treatment approach for enhancing the independence and quality of life of individuals with dementia (Hopper et al., 2013). These strategies capitalize on the remaining strengths of individuals, such as reading and visual processing abilities, and reduce cognitive demands on memory. External strategies also take advantage of cues in the environment to trigger recall; they may take the form of a written reminder, calendar, memo board, notepad, sticky note, or a designated place for an object (e.g., a labeled container for hearing aids) (Bourgeois, 2014a).

Researchers have explored the use of external strategies across the continuum of dementia. Bourgeois (1990) examined the use of written and picture cues, in the form of "memory wallets," to assist in the retrieval of personal information necessary to maintain conversations between individuals with dementia and their caregivers. Simple declarative sentences (one per page) and a relevant photograph or illustration were sufficient to cue the reading of a sentence, elicit elaborated comments about the topic, and reduce the frequency of ambiguous and repetitive verbalizations. External strategies have also been found to increase turn-taking and topic maintenance, and reduce partner prompting and conversational dominance (Bourgeois, 1993; Hoerster, Hickey, & Bourgeois, 2001).

Furthermore, individuals with various degrees of neurocognitive disorder have improved their conversations using memory books that were modified to address specific functional impairments, such as enlarged print size for visual impairment or use of wearable aids for individuals who wander (Bourgeois, 1992; 2014a). Specific problem behaviors, such as repetitive questions about a deceased relative or the status of a tax return, were addressed by including a page in the memory book that answered the question (e.g., "Mary died in 1994 and is buried in Westlawn Cemetery" and "My tax refund check was deposited in the bank on Monday"). Repetitive questions decreased as a result of training spouses to use written cueing strategies (Bourgeois, Burgio, Schulz, Beach, & Palmer, 1997). Nursing assistants were trained to use portable, laminated memory books to increase comprehension and cooperation with care activities, such as bathing and grooming, by residents with dementia (Bourgeois, Dijkstra, Burgio, & Allen-Burge, 2001). Practical instructions and guidelines for using a variety of visual, graphic, and written strategies in various formats for a continuum of problem behaviors are available for professional and family caregivers (Bourgeois, 2014a).

Choosing an external strategy

Professionals should have a discussion with individuals about their daily schedule and develop unique individualized techniques to facilitate daily strategy use before intervention begins. An individual's strengths and unique memory and communication needs should be the basis of any clinical decision. This practice is especially important if professionals want to ensure successful implementation and use of external strategies. Effective implementation of external strategies requires choosing the structure of the aid that is appropriate for the individual's needs. For example, individuals with dementia can benefit from external strategies that are modified appropriately for their sensory needs; this applies regardless of stage or severity (Bourgeois, 1992).

Prior to choosing an external strategy, the individuals' functional vision, hearing, and fine motor skills should be determined. Enlarging the text in the memory book, increasing the volume of an alarm and adding tabs to assist with flipping pages are examples of appropriate sensory modifications to external strategies. As dementia progresses, environmental supports for hearing loss become particularly important, including the use of hearing aids, personal assistive hearing devices, or reducing the amount of environmental noise (e.g., TV and radios; Hopper & Hinton, 2012). In addition to the sensory needs of individuals, their past history with external strategies should be considered to promote personalization and generalization. If the individual used a planner for appointment keeping during his or her career, for example, then a similar, pocket-sized planner might be more easily adopted than something new (e.g., a wall calendar) that would require new learning.

External strategies are most effective when individuals are involved in choosing aids that already may be part of their daily routine (Camp, Bird, & Cherry, 2000). For example, individuals may have a planner, calendar, or smartphone in which they keep appointments and telephone numbers. The effective use of these aids can be enhanced by teaching individuals with cognitive decline to look at the planner or calendar in the morning when they are eating breakfast (Bourgeois, 2013), thereby reducing the cognitive demand of remembering to look at the planner during daily activities. Researchers have explored ways to teach routine use of external strategies, such as following safe-swallowing steps written on cards during meals (Benigas & Bourgeois, 2016) or writing notes to remember telephone messages (Lanzi, Wallace, & Staltari, 2016).

Learning how to use an external strategy

Individuals with dementia can learn to successfully incorporate external strategies into daily routines when provided appropriate training (e.g., vanishing cues, errorless learning, and spaced retrieval; Ehlhardt et al., 2008). *Spaced retrieval*, for example, is an evidence-based training strategy in which individuals practice remembering new information across increasingly longer intervals (Brush & Camp, 1998). Research has shown that spaced retrieval can be a successful training strategy for individuals across the continuum of dementia severity for a variety of treatment targets (see Benigas, Brush, & Elliot, 2016). On the basis of the principles of classical conditioning, repetition priming, and errorless learning, spaced retrieval takes advantage of the relatively preserved skills of reading, motor learning, and procedural memory to help individuals remember specific facts (e.g., their room number) and functional strategies (e.g., reading the daily calendar or using safe swallowing precautions; Benigas & Bourgeois, 2016).

Learning of a new behavior is also facilitated when paired with an established activity (Camp et al., 2000). For example, the new behavior of checking the calendar is likely to occur more naturally when paired with morning tasks. Prompting can also remind the person to use the newly learned strategy. As an example, spaced retrieval training of routine calendar use might include the following prompt and reply:

- Prompt: “What are you going to do when you’re drinking your morning coffee?”
- Response: “I’m going to check my calendar for my appointments.”

When using this procedure in treatment sessions, the clinician prompts the verbal response over increasing intervals, as the individual retains the information longer. The treatment session ends with doing the desired task, checking the calendar while drinking coffee. Training ends when the individual completes these behaviors independently.

Cues for maintaining use of external strategies

Other ways to maintain the new skill may include helping people in the person’s environment learn how to use intermittent prompting and other cues to encourage ongoing use of the new strategy. For example, visual and auditory cues can encourage routine external strategy use (Bourgeois, 2014a), as when completion marks in the form of visual cues (e.g., cross-outs) are used to indicate a task was accomplished. Devices, such as timers or alarms that produce an auditory signal can also be integrated into daily routines to remind an individual to complete a task (e.g., taking medications). Audio cues should always be accompanied by a written or textual cue to remind the individual of the alarm’s intended purpose. For example, a written note placed next to an alarm might read “look at calendar” or “open memory book” (Lanzi et al., 2016). As noted at the beginning of this section, any intervention decisions should involve ongoing discussions with individuals and their families about daily schedules and individual preferences.

External strategies for mild neurocognitive disorder

As noted previously, mild neurocognitive disorder may or may not progress to major forms of the disorder. Even though effects on activities of daily living may not be evident for these individuals, they may benefit from some external strategies to support their daily organization and function.

Organizational supports

Organizational supports consist of calendars, planners, and pocket-sized notebooks (i.e., “memory wallets”) (Bourgeois, 2013). There are a variety of calendar shapes, sizes, and formats to consider when choosing an aid. For example, an individual may prefer a daily view, rather than the monthly view, because of the space for writing or the portability of the calendar. The calendar should be modified to match the individual’s visual needs (e.g., enlarging the font size or the size of the aid). Using colored text, symbols, and labels can improve the salience of the written information. During treatment, it is important to trial multiple calendar types to allow for individual preferences on the basis of daily routines.

Calendars can be used to support short- and long-term as well as prospective memories. For example, individuals can use calendars to remember their child's birthday or an upcoming medical appointment. It is important to model and role-play how to enter and retrieve information from the calendar (Sohlberg & Turkstra, 2011). In addition, a memory wallet may be used to promote organization. The memory wallet is portable and should contain information that is specific to individuals and information they would want with them at all times, such as doctor appointment cards, health insurance cards, emergency contacts, and where to find their passwords. Memory wallets can be made in wallet-size pictures or business card holders or a small photo album. It may be beneficial to provide examples of memory wallets for the individual to preview prior to helping individuals design their own aids.

Note-taking supports

Most individuals are familiar with note-taking strategies because they are used to support memory in various aspects of life, such as in school or phone messages. Individuals with smartphones often use the Notes section of the phone to write reminders, to-do lists, and other lists (e.g., doctor's phone numbers, names of people in a specific group, books and movies, and frequent flyer numbers). In early cognitive decline, note-taking can be a useful way to prepare content or questions for conversation. For example, prior to a social event, a list of names of possible attendees could be reviewed to increase the possibility of retrieving a specific name during the event. A list of topic starters, such as "What are your vacation plans? How are your grandchildren?," could help maintain a conversation. Note-taking devices may include planners, notebooks, or smartphones. If the individual writes down new information learned at the event, such as the names of new members to the group or the date of the next group meeting, there is a greater chance of retrieving the information later (Bourgeois & Hickey, 2009). Planners or journals also can be used to retrieve personal or factual information such as daily events, someone's name, information from a phone call, or thoughts about an event that the individual wants to remember or retrieve during a conversation (Greenaway, Duncan, & Smith, 2013; Woods, 1983). Although note-taking is typically recorded by writing, individuals with visual or motor impairments may use an audio recording device as an alternative method.

Memory books

It is important to start developing written external memory aids, or expanding the use of currently used systems, during the early stages of the disease. If the individual uses the computer for e-mail, managing personal finances, and searching the Web, it is good to review the range of ways to organize and document information for future retrieval (e.g., banking and tax information, lists of important facts, or dates to remember). Some people enjoy writing their life story, or advice and other tips for success in life, for their grandchildren. These activities often segue naturally into creating an illustrated memory book for future use if the disease progresses. In such cases, development of the memory book can include plans for modifications, as the person moves through moderate to severe cognitive-communication disorders. If the individual uses his or her smartphone as his or her "memory book," then it would be important to review the contents and accessibility to the content with the individual, and make modifications as needed to maintain its functionality. Similarly, if the person uses a planner for organizing information, there may need to be modifications to the planner (e.g., added tabs) to ensure ease of finding desired information quickly.

During the earliest phase of treatment, individuals should participate in the design, organization, and selection of content for the memory or communication aid (King, Alarcon, & Rogers, 2007). At this point, the individual can choose which information is most important and, if desired, pictures to illustrate the text. The portability of the aid can also be adapted on the basis of the lifestyle of the individual. Individuals in the early stages may want their smartphone, a book, or planner that fits in a shirt pocket or a purse when they are in the community and also have a binder-sized memory album at home.

For individuals with primary progressive aphasia, a communication book can serve as a support for verbal expression and verbal communication breakdowns (Khayum et al., 2012). In addition, if a high-technology version is selected (e.g., PowerPoint © presented via iPad with pictures and labels or the Pic-Collage application) (Khayum et al., 2016), individuals may record themselves saying the phrases associated with the book. This personalization of the book may enhance recognition of the text and picture in the later stages, thereby helping to prolong functional use of the aid. Electronic versions of memory books (e.g., iPad apps and talking memory books) and recordable greeting cards have the potential to enhance quality of life of individuals in the late stages by maintaining recognition of family using these types of auditory and visual supports.

External strategies for major neurocognitive disorder

Memory books

As individuals progress to a major neurocognitive disorder, memory books can continue to support their communication. Memory books can also be used to enhance orientation, reduce confusion, and help individuals communicate wants and needs throughout the continuum of the disease (Bourgeois, Lenius, Turkstra, & Camp, 2007; Brush, Fleder, & Calkins, 2012). These simple strategies capitalize on preserved reading ability and recognition memory (Beukelman & Mirenda, 2013) and assist with retrieval of semantic and episodic memories (Bourgeois, 1990, 1992; Khayum et al., 2012).

Sensory skills change with disease progression. Thus, written and visual information needs to be modified to accommodate for sensory impairments (Bourgeois & Hickey, 2009; Hinshelwood & Henry, 2016). Font size may need to be increased, and sentence structure and length may need to be simplified. Talking, or audio-enhanced formats, such as voice-output iPad applications (e.g., Pictello; Assistiveware, 2017) and recordable photo albums, may be feasible options for individuals with visual limitations. In addition, the memory book content can be modified for different environments. For example, a memory book for a resident with dementia in a nursing home may include information about the nursing staff and the daily schedule, such as when meals are served and activities are planned. Memory books may include general information about the home to familiarize the individual with his or her environment.

Memory books can be adapted on the basis of the daily routine of the individual. In the nursing home, individuals who are ambulatory may find a 3×5-in. notecard placed on a key ring or a lanyard to be useful. Nursing aides can be taught to write answers to a resident's repeated questions, such as "When is lunch?" The reminder card would read, "Lunch is at noon," and would be given to the individual (Bourgeois et al., 1997). Memory wallets or reminder cards can accompany the individual using a wheelchair if they are attached to the chair. In the later stages, the memory book may evolve into a communication board that consists of pictures representing typical wants and needs of the individual to support communication with family members or nursing staff (Hinshelwood & Henry, 2016).

The purpose of written supports may evolve as the disease progresses. During the early to moderate stages of the disease, a memory or communication book may support word-finding deficits in conversation. As the disease progresses from the moderate to severe stage, the book may be used to facilitate conversation as conversation partners jointly attend to the content on each page. Reminder cards have been shown to allow individuals to answer their own repeated questions, thereby decreasing repeated questions to staff (Bourgeois et al., 2001).

Scripts

In everyday life, individuals often use the same "scripted" information when talking on the phone, saying prayers, scheduling an appointment, ordering at a restaurant, or completing personal care activities. Some individuals may have difficulty remembering or expressing what to say or do in these situations. Script training was developed originally for persons with severe expressive language deficits who wanted to be able to verbally express a meaningful message (Youmans, Holland, Munoz, & Bourgeois, 2005). Recent adaptations of script training involve reading written scripts for more complex situations such as reciting prayers or following multistep procedures (Holland, Halper, & Cherney, 2010). Developing personalized scripts to include in a memory book, or to teach verbally, may enhance the automatic retrieval of information practiced during functional communication and completion of daily activities (Khayum et al., 2012). More research on this topic is needed (Cosentino, Chute, Libon, Moore, & Grossman, 2006).

When designing a script, the everyday lives and needs of individuals must be considered, in addition to their language and memory skills. For example, individuals with primary progressive aphasia may benefit from having access to written prayers to read aloud instead of spending the time verbally rehearsing a script to be recited from memory. The grammatical and vocabulary complexity should be considered when developing scripts (Cherney, 2011; Cherney, Halper, Holland, & Cole, 2008).

Memory books can contain pages with personal care "scripts" for getting dressed or brushing teeth (Bourgeois, 2014b). These scripts can be laminated and posted on the mirror above the sink to facilitate completion of care activities. Personalized written templates, or scripts, can be made for common daily activities (e.g., addressing an envelope or writing a check; Khayum et al., 2016) to assist the receptive and written language skills of individuals with primary progressive aphasia. Dialogue scripts (e.g., talking on the telephone) can be designed to support a communication exchange. The number and length of conversational turns should be considered when creating the script with the individual (Cherney, 2011). It is important for the individual to be motivated to practice the script to benefit from using this strategy (Khayum et al., 2012).

Supporting choice and decision-making

Decision-making is important to the quality of life of all individuals with dementia and is an integral factor to providing truly person-centered care through the introduction of cognitive-communication strategies. Decision-making opportunities range from simple choices, such as choice of clothing, food, and activities, to more complex matters of finance, independent living, consent for research participation, and voting (Moye & Marson, 2007). Decision-making capacity is defined as the ability to take in, understand and comprehend treatment information, to reason, and to appreciate the consequences of choices (Dymek, Atchison, Harrell, & Marson, 2001; Moberg & Rick, 2008).

When the cognitive processes of attention, visuospatial perception, executive function, and memory are impaired, it is often assumed that individuals with these cognitive-communication deficits are not capable of making decisions, especially more complex decisions related to advance care directives and end-of-life planning. Chang (2015) found, however, that individuals with mild and moderate dementia could reliably demonstrate these capacity criteria when supported with external strategies. When medical vignettes about feeding tube placement and drug treatment for dementia were read aloud and accompanied by written text and pictures, individuals with mild to moderate dementia were able to "convey a clear treatment choice with logical consistency" (Chang, 2015, p. 73); they did not demonstrate this ability, however, when only hearing the vignette without the visual supports. These results suggest that the use of visual supports can enhance the ability of an individual with dementia to understand explanations about a treatment and its potential outcomes, so this information can be used to support the decision-making process (Chang, 2015).

Other research has documented that decision-making by individuals with dementia can be facilitated using external strategies (i.e., visual and graphic cues) pertaining to care preferences. Bourgeois, Camp, Antenucci, and Fox (2016b) assessed the effects of visually based category-sorting materials on the interactions of residents with dementia with nursing aides during a preference and choice determination task. The VoiceMyChoice^{TM} tool was developed for this project, which is a mat with three boxes labeled *sometimes*, *always*, and *never*. Labeled picture cards of popular activities, foods, and personal care choices (e.g., taking naps and playing Bingo) are used as stimuli when determining "how often" the individual enjoys each activity. Nursing home residents were asked to place the picture card on one of the three boxes. Results showed that resident preferences were consistent and reliable, and the Mini-Mental State Examination (Folstein, Folstein, & McHugh, 1975) scores were not related to response consistency. Nursing aides also gained a better understanding of the resident's preferences after treatment.

Environmental adaptations

The quality of life and functioning of individuals with dementia may be impacted significantly by the environment in which they live (Bourgeois & Hickey, 2009). Caregivers and nursing home personnel using a person-centered approach establish the care environment as a tool for supporting communication and independence of individuals with dementia. The environment is arranged to facilitate communication and orientation. In addition, excessive sensory stimuli (e.g., sounds, movement, and smells) are carefully monitored to limit distractions (Brush et al., 2012). A communication-enhancing environment helps a person know what to expect, encourages appropriate and functional behaviors, uses multiple modalities to provide information, and minimizes distracting stimuli (Brush et al., 2012).

Brush, Camp, Bohach, and Gertsberg (2015) examined the use of signage to support independence and wayfinding (e.g., successfully locating a room) of nursing home residents with dementia. In a two-phase study, the researchers examined signage preferences of residents (Phase I) and the effect of this signage on time and independence in wayfinding (Phase II). Residents preferred signage with a colored background (bright green, bright magenta, and bright royal blue) with white text and pictograms (Brush et al., 2015). When wayfinding was observed pre- and post-sign implementation, the residents showed a decrease in average time to navigate three routes (e.g., dining room to activity room) and an overall increase in independence for wayfinding.

Labeling objects and providing written directions for activities and routines can help an individual maintain independence. For example, Douglas (2016) found that independence of a resident during showers increased when laminated signs with the steps for showering were affixed to the shower wall. These cues also led to a decrease in aggressive behavior during the care routine. Similarly, a written invitation, such as "please fold the laundry" on a laundry basket, placed within view of an individual has been shown to lead to more frequent engagement in meaningful activities (Bourgeois et al., 2015).

Object arrangement is another important component of environmental adaptations. The goal of strategic object arrangement is to enhance engagement and decrease negative behaviors among individuals with dementia (Bourgeois & Hickey, 2009). For example, when the common-room furniture is arranged in groupings instead of lined up along a wall, conversations between residents are more likely to occur. Similarly, providing artwork in the hallways can result in discussions about the art. Having personal objects and furniture from an individual's own home can enhance the experience of being at home in the nursing home, thereby reducing responsive behaviors (Elliot, 2011).

Adaptation of the environment to enhance outdoor activities is also important for supporting people with dementia. Research suggests that therapeutic gardens enhance the quality of life for an individual with dementia (Brawley, 2002). In addition to gardening, individuals with dementia can go for walks, eat or read, or listen to music outside. Knowing whether the individual spent much time outdoors for a profession (e.g., farming) or engaged in sports and leisure activities (e.g., fishing, boating, or walking the dog) can help teams develop person-centered activities that include some features of the past activity. A former farmer or gardener might enjoy shoveling dirt in a garden space or raking leaves. A boating enthusiast might enjoy cleaning and polishing a canoe. Personally relevant activities can be applied and modified as the disease progresses. For example, a woman with moderate dementia who enjoys sewing, but has a significant visual impairment, might enjoy categorizing fabrics by texture and color.

Caregiver training

Caring for individuals with dementia requires a team approach and includes both formal and informal caregivers, such as health professionals and family members (Douglas & McDonald, 2016). Caregiver training can act as a cognitive-communication strategy to support the independence and communication of individuals with dementia, as they progress along the continuum of cognitive-communication decline (Hinshelwood & Henry, 2016). In the later stages of dementia, deficits in verbal communication ability may lead to social inactivity and withdrawal (Brush et al., 2012). Furthermore, frustrations from verbal communication deficits may lead to communication through physically or verbally aggressive behavior (Desai & Grossberg, 2001). Professionals must be skilled at facilitating communication interactions and interpreting frustration and agitation as communication acts. Speech-language pathologists and other professionals can play important roles in educating caregivers to understand an individual's actions as expressions of unmet needs and to find ways to meet those needs. Training begins by establishing rapport with caregivers by first asking questions about challenges in caring for their family member. This involves listening to their concerns, and then offering suggestions and support. For example, a caregiver might report that an individual with dementia is noncompliant with showering. A possible suggestion is to ask the individual to read a visual reminder card that states "showering makes me feel fresh and clean" before proceeding with the task.

In the later stages, professional caregivers, such as nurses or nursing aides, may play a greater role for individuals who are residents of long-term care facilities; however, family caregivers often maintain a desire to be involved in the care of the individual and should be consulted regularly (Yamamoto-Mitani, Aneshensel, & Levy-Storms, 2002). Speech-language pathologists and other professionals can help family caregivers learn to use effective communication skills and external strategy modifications.

Teaching specific communication strategies can promote enhanced communication in the home environment. Family members can be taught to provide extra time for individuals with dementia to express their thoughts. They can learn to support receptive language by breaking tasks into individual steps, with instructions given one at a time, using short and simple sentences (Bourgeois & Hickey, 2009; Small & Gutman, 2002). Individuals with primary progressive aphasia, in the early stages, can benefit from family members promoting self-cueing strategies for lexical retrieval. The speech-language pathologist can help family members learn to use cueing phrases, such as "Tell me more about it?" to facilitate initiation of self-cueing (Khayum et al., 2012). Teaching caregivers to use multimodal communication approaches during the later stages of the disease, such as gesturing, writing, and drawing, can reduce the burden on receptive language abilities and ease frustration in communication exchanges (Hinshelwood & Henry, 2016). Family members can be encouraged to lead communication discussions to decrease the burden on the individual with dementia. As the individual's frustration level increases due to inability to communicate verbally, family members can be taught to use visual and nonverbal communication strategies (e.g., captioned pictures, touch, and facial expressions) to support communication (Hinshelwood & Henry, 2016).

Communication partners can learn to assume responsibility for modifying external supports when impairments intensify or other changes occur. For example, new pages can be added to a memory book or wallet with the birth of a new grandchild, a graduation, or wedding. When the individual has difficulty reading small print, the text can be replaced with print in a larger font. In addition, sentence structure and length modifications can be implemented to decrease the sentence complexity and improve readability (Bourgeois, 2014a; Khayum et al., 2016). Family members may need instruction in how to document specific words and information involved in a communication breakdown (Khayum et al., 2012), once it has been resolved. These words and related information then can be added to the memory book to support future communication (Khayum et al., 2012).

CONCLUSION

Communication supports are tools for enhancing the communicative interactions of individuals with cognitive-communication impairment and their communication partners. Emerging evidence supports the development of person-centered goals that reflect the needs and interests of the person, the progressive nature of dementia, and the changing needs of the individual. Individuals must be included in the process of identifying communication support needs, designing and evaluating the supports, and modifying them as needed. Successful communication support use involves appropriate, personalized visual and written cues, and appropriate training for individuals and their communication partners. The environment should be modified to include communication supports in everyday life in a person-centered approach. Finally, caregivers need explicit instruction in how to support the use of compensatory strategies across the continuum of cognitive decline.

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