Memory problems are generally quite prominent in dementia and they have a significant impact on everyday functioning. Medication developed for Alzheimer’s disease, for example, acetylcholinesterase inhibitors, can slow down the increase of cognitive impairment for a while. In addition to pharmacotherapy, psychosocial treatment methods are also used, some of which have a positive effect on cognition, for example, cognitive rehabilitation, cognitive stimulation therapy and movement therapy. However, more research is needed. This article first describes the consequences of memory problems on the everyday life of people with dementia and summarizes research findings on how people with dementia experience and cope with their illness. We then discuss the most frequently applied psychosocial treatments for cognitive problems in dementia.

**Keywords:** cognitive rehabilitation • cognitive stimulation • coping • dementia • memory problems • movement • reminiscence

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**Learning objectives**

Upon completion of this activity, participants should be able to:

- Describe memory problems in people with dementia, their impact on everyday life, and commonly used coping strategies, based on the review
- Describe psychosocial treatments aimed at improving the memory performance of people with dementia, based on the review
- Describe pharmacotherapy aimed at improving the memory performance of people with dementia, based on the review
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Editor

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CME Author

Laurie Barclay, MD, Freelance writer and reviewer, Medscape, LLC
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Authors

Rose-Marie Dröes, VU University Medical Center, Amsterdam, The Netherlands
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Henriëtte G van der Roest, VU University Medical Center, Amsterdam, The Netherlands
Disclosure: Henriëtte G van der Roest has disclosed no relevant financial relationships.

Lisa van Mierlo, VU University Medical Center, Amsterdam, The Netherlands
Disclosure: Lisa van Mierlo has disclosed no relevant financial relationships.

Franka JM Meiland, VU University Medical Center, Amsterdam, The Netherlands
Disclosure: Franka JM Meiland has disclosed no relevant financial relationships.

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Franka JM Meiland has disclosed no relevant financial relationships.

Dröes, van der Roest, van Mierlo & Meiland

Dementia is a clinical syndrome. The diagnosis of dementia is made when a number of symptoms occur simultaneously [1]. In most cases, memory problems are prominent and the individual also has problems with abstract thinking or judgement, language impairments, apraxia and/or trouble recognizing objects. These disorders occur when the individual is fully alert, are such that they hamper everyday functioning, and they are not a consequence of psychiatric disorders. The diagnosis of dementia is never made solely on the basis of memory problems.

There are many types of dementia. Some are treatable, such as dementia associated with a vitamin B12 deficiency or resulting from adverse drug interaction; other types are not treatable and are accompanied by progressive degeneration of the brain, such as Alzheimer’s disease, vascular dementia and frontotemporal dementia. While Alzheimer’s disease is caused by senile plaques and neurofibrillary degeneration in the cortex and gray matter of the brain, resulting in global cognitive deterioration with memory problems in the foreground in the early stage of the disease, in vascular dementia, cortical as well as subcortical parts of the brain are injured by multiple small strokes, often reflected in focal neurological symptoms besides progressive cognitive deterioration. Frontotemporal dementia is caused by degeneration of the frontal and temporal parts of the cortex and, unlike the other two types of dementia, is characterized mainly by changes in behavior. Alzheimer’s disease is the most common cause of dementia.

The drugs that were developed for Alzheimer’s disease in past decades, for example, the acetylcholinesterase inhibitors rivastigmine (Exelon®), donepezil (Aricept®) and galantamine (Reminyl®), and the NMDA-antagonist memantine (Ebixa®), at first have a positive effect on cognition and the behavior and mood impairment, because of an increased risk of death.

The abovementioned drugs have side effects in some patients, for example, nausea, diarrhoea and fatigue. Donepezil has fewer side effects than rivastigmine. However, administering the active ingredient in the latter transdermally through a patch instead of tablets produces fewer side effects. Memantine has few side effects. Galantamine (Reminyl) is not advised for mild cognitive impairment, because of an increased risk of death.

In addition to pharmacotherapy, psychosocial treatment methods are also applied in dementia, and some of these methods have a positive effect on cognition and the behavior and mood symptoms that are common in people with dementia. They can also help people cope with their dementia.

This article consists of two sections. First, we address the way in which memory problems affect the everyday life of people with dementia, what is known from research about how people with dementia experience their illness and how they cope with it. Second, we discuss the current state of affairs with regard to psychosocial treatments aimed at improving the memory performance of people with dementia and/or supporting them in dealing with the memory and other cognitive problems in their daily lives, with the ultimate goal of improving their quality of life.

Dealing with memory problems in dementia

Memory problems are often the first manifestation of most forms of dementia. They can affect daily life in many ways. For example, people can have trouble doing the shopping, handling money, using public transport and cooking, among other things. Memory problems can also be extremely inconvenient socially if they make people forget appointments or not remember recent
conversations. This can negatively impact self-confidence and well-being. Apart from memory problems we also see gradually increasing disorders of orientation in dementia (regarding places, time and persons), which leads to the individual not being able to find his/her way outside his/her home and having more and more difficulty recognizing family, friends and acquaintances; other disorders occur in understanding language and language expression (aphasia); handling objects (apraxia); and carrying out activities of daily living (e.g., washing, getting dressed and housekeeping).

How do people with dementia experience their cognitive impairments?
People with dementia differ in the degree in which they understand and are aware of their cognitive decline. Some are fully aware of it; others are considerably less aware or even completely unaware of their impairments [6,7]. Research shows that there is also a large variation in how people experience their dementia. Whereas some say that they accept the disease as more or less being part of the ageing process, others indicate finding it (very) difficult to deal with the cognitive decline and the limitations this puts on their daily functioning [8–10]. In summary, the problems that are experienced refer to: having to accept the worsening cognitive impairments and increasing dependency on other people; maintaining an emotional balance; maintaining contact with family, friends and acquaintances, and preventing social isolation; developing an adequate care relationship with healthcare professionals; and finally, dealing with an uncertain future and an institutional living environment [11,12]. People can become insecure, their perceptions can change, they can experience anger, fear and frustration, but also changes in their social relationships and roles. As such, people with dementia are facing a set of adaptive tasks comparable to those experienced in chronic illness in general (see Box 1 [12]).

Adaptation & coping
People with dementia use a range of coping strategies to maintain a sense of control and balance, for example, denial, downplaying the situation, overcompensation, avoiding social contacts, withdrawing, keeping up appearances, confabulation and the use of humor [7–9,11,13]. This requires energy and is emotionally draining. Intervention studies that investigated the effect of support for the different adaptive tasks on the behavior and mood of people with dementia [14–17] demonstrate that offering the appropriate support can have a positive effect on the disorders in psychological functioning and on behavior [12].

Memory problems: what can you do about them?
In past decades much research has been conducted into psychosocial treatment methods for dementia-related memory and cognitive disorders. For this article we studied reviews from 1990 to 2010 included in the PubMed, PsychInfo and Cinahl databases, covering publications from 1970 until April 2011. We focused our study on five most frequently used methods aimed at, and reporting on, effects on memory performance or other related cognitive skills, for instance cognitive rehabilitation, cognitive stimulation therapy (CST), memory groups, movement programs including psychomotor therapy and reminiscence (a detailed list of search terms used in this study can be obtained from the authors). We found 20 relevant reviews [11,18–36]. We studied the abstracts of all relevant reviewed articles and then referenced other reviews. We furthermore searched the Cochrane Database for systematic reviews.

### Psychosocial methods
In recent decades various psychosocial methods to assist and support people with dementia in coping with their cognitive problems have been applied with (some) positive results [12,36,37]. These methods focus on: stimulating the individual’s functioning and preventing ‘excess disabilities’ through global or specific cognitive stimulation and exercise (e.g., reality orientation training, cognitive rehabilitation, CST, memory groups, movement therapy and bright light therapy) or by the application of compensatory aids (e.g., assistive technology); and on the psychological acceptance of, and dealing with, cognitive limitations to improve the quality of life, for example, reminiscence, activity groups, psychomotor therapy, validation and behavior therapy. The methods frequently target a combination of different objectives [12].

Between 1970 and 1990 emphasis was on practicing skills and the (re)activation of cognitive functions; for example, by cognitive stimulation and reality orientation training. A basic principle was that people with a mild form of dementia still have the ability to store information and stimulating their cognitive reserve can therefore benefit them [38]. In the 1990s, owing to the limited results of using only cognitive stimulation and the negative consequences that resulted from the repeated confrontation with one’s limitations, the focus shifted to so-called emotion-oriented, psychosocial approaches, such as psychomotor therapy, activity groups, validation therapy and reminiscence. The latter approaches aim to support and assist the person with dementia, not only in coping with the cognitive consequences of the disease, but also and especially with the emotional and social consequences. An important goal of these methods is also to maintain communication and contact with persons with dementia and to prevent them from becoming socially isolated and lonely. The activities are attuned to individual abilities and limitations and

### Box 1. Adaptive tasks in dementia.
- Coping with one’s own disabilities
- Preserving an emotional balance
- Maintaining a positive self-image
- Preparing for an uncertain future
- Dealing with the day care, care home or nursing home environment and treatment procedures
- Developing an adequate care relationship with healthcare professionals and staff
- Developing and maintaining social relationships

Modified with permission from [12].
are compatible with the individual’s experiences. Psychomotor therapy, activity groups and reminiscence therapy are especially suitable for people with mild-to-moderate dementia, while validation can be applied in more advanced stages of the disease, when the individual lives in his own world of experience. Each of these approaches appears to be of value for the cognitive, emotional and/or social adaptation, as research shows [11,16,19,37], although further research is recommended as the quality of the studies is often mediocre.

In the past 10 years, there has been an upsurge in the study of cognitive stimulation in Europe (including in the UK, France, Italy and Spain) and in the USA [39,40], partly because of improved early diagnostics. However, the methods now aim to accommodate the variation in individual needs, desires and cognitive capacities of people with dementia. The results are hopeful. Especially in early-to-moderate dementia, cognitive stimulation along these lines can result in (some) improvement in cognitive functioning if it focuses on the individual problems and needs of the person with dementia and their cognitive capacities [40].

We will present an overview of the proven effects on memory and other cognitive functions of the most frequently used psychosocial methods, namely: cognitive rehabilitation, CST, memory groups, movement programs and psychomotor therapy, and reminiscence.

**Cognitive rehabilitation & cognitive training**

Cognitive rehabilitation is defined as: “any intervention strategy or technique which intends to enable clients or patients, and their families, to live with, manage, by-pass, reduce or come to terms with deficits precipitated by injury to the brain” [41]. After identifying goals that are relevant to the individual in question, strategies are designed and followed to achieve these goals [42]. In the case of a progressive disease, such as Alzheimer’s disease, the goals obviously need to be adjusted as time passes [43]. In the early stages of dementia, emphasis is on coping with cognitive changes, such as memory and orientation problems, and their impact on everyday life and relationships (e.g., participation in activities and social participation). At that stage people often still have the capacity to learn new information, retain that which is learned, improve their practical skills and adapt their behavior. This is possible because the implicit or procedural memory is still intact [21,44]. Although it is more difficult to absorb new information in early dementia, memories can be retained once they are stored. And that means that improvement of memory and daily functioning are basically possible with the correct assistance.

Clare describes two ways in which cognitive rehabilitation can address memory problems in the early stages of dementia [43]:

- **First**, by building on the memory skills a person still has: this refers to continuing to practice activities of daily living and other skills by means of offering structured exercises/activities; the person receives instructions, offered through images, gestures or in writing (these instructions can be dropped gradually when the activity becomes routine: ‘vanishing cue’ technique).

Different techniques are used in the training process, for example, ‘spaced retrieval’ and ‘errorless learning’;
- **Second**, by using compensatory aids when memory fails, for example, the use of a calendar or diary, a memory or life book with important personal information, stickers or signs on doors and cupboards indicating their function or content. Finally, lists can be made of how to carry out a practical task (making coffee or operating the washing machine). Obviously these types of aids are only useful if the individual understands what they are for and he/she uses them regularly, so it becomes a habit. The people around the individual can stimulate their use by reminding him/her. When using the aid gradually becomes routine, the need for this encouragement will decline.

Cognitive rehabilitation can be offered individually [45], as well as in families [46], in a group [47], as part of a broader psychosocial intervention [48] or by means of a computer program [49,50]. Apart from professionals, informal carers, friends or volunteers can also be involved.

Clare has described extensive guidelines for cognitive rehabilitation; for example, that it [43]:
- **Must focus** on individual goals that are realistic, practically relevant and meaningful for the individual;
- **Must be** based on the assessment of individual cognitive abilities, including memory skills and memory problems, and also must be based on observation of functioning in daily life;
- **Must be** based on agreement between the client and therapist on the goals of the intervention and the methods to be used.

In an (uncontrolled) study among six individuals with Alzheimer’s disease, Clare et al. found that the method described above, which is partly based on the ‘errorless learning’ principles, demonstrated an improvement in everyday memory problems [51]. Very recent research that compared the effect of cognitive rehabilitation in people with mild Alzheimer’s disease and/or vascular dementia (MMSE >18; n = 24) with ‘relaxation exercises’ (n = 24) and ‘no treatment’ (n = 22) in a randomized controlled trial (RCT), showed that the individuals who had received cognitive rehabilitation (eight sessions, in accordance with method above) performed better on the personal goal activities they formulated beforehand (such as remembering chores to do in and around the house, learning to use a mobile phone and maintaining concentration while cooking) and were more satisfied [42]. When an informal carer was involved in the intervention the individual performed better than those who participated without an informal carer, thanks to more frequent practice between therapy sessions when an informal carer was involved. For the informal carers their quality of life improved. The behavior changes in the person with dementia were supported by MRI data (increased activity in certain brain areas) that were available on part of the individuals. After the 6-month follow-up the cognitive rehabilitation group performed better on a memory test. This improvement on the trained functional tasks and memory after cognitive rehabilitation and at follow-up (after 3 months) was also found.
by Loewenstein et al. who investigated a 24-session rehabilitation program [52]. They also reported not finding a generalizing effect on other neuropsychological measures as a result of the training.

Earlier studies also demonstrated the effect of cognitive training on memory (on recall in particular) and the attention of people with Alzheimer’s dementia [23,53–59]. Controlled studies of the effect of reality orientation training (ROT) in the 1980s already showed effects on cognition, more specifically on memory and orientation, after 8–12 weeks of training [20,66]. Later research showed that longer programs (8–40 weeks) are more effective than a short program (4 weeks) to combat cognitive decline and postpone nursing home admission [57]. The recently studied combination treatment of ROT and anti-Alzheimer medication (donepezil) – investigated earlier by Cahn-Weiner et al. who found a medium improvement of recall and recognition after 6 weeks of training [58] – proved more effective than medication alone [59]. After only 3 weeks of daily ROT and movement activation, in which informal carers also participated, the combination therapy already yielded a significant improvement on the MMSE, whereas medication alone did not show any significant improvement. After 2 months, during which the informal carers continued the therapy at home, the MMSE improvement was still present. The effectiveness of techniques, such as ‘errorless learning’, ‘spaced retrieval’, ‘vanishing cues’ and external memory aids (e.g., a diary) was also confirmed in research [60].

Yu et al. conclude on the basis of a comprehensive review of the literature that cognitive training in the early stages of Alzheimer’s disease improves cognition, activities of daily living and decision-making [40]. The interventions are more effective when carried out in a structured manner, are aimed at specific functions affected by dementia and are at the individual residual capacity, or combined with cognition-enhancing medication. The effects are generally medium (d = 0.47; [61]).

Recently several studies also investigated the effect of computer-assisted cognitive training programs. A small (n = 6) uncontrolled American study demonstrated that an intensive 6-week cognitive training program among elderly with moderate-to-severe dementia can lead to a general improvement of the cognitive functions, including short-term memory [62]. In an RCT with 46 people with a mild form of Alzheimer’s dementia, a Spanish study measured the effect of the Multimedia Cognitive Stimulation program ‘Smartbrain’ (frequency: 3 x 20 min/week over a period of 24 weeks) in combination with a daily psychostimulation program (8 h a day in day treatment) and the use of cholinesterase inhibitors (group 1), compared with day treatment in combination with cholinesterase inhibitors (group 2) and the use of cholinesterase inhibitors alone (group 3) [59]. After 12 weeks positive effects (improvements) were found for both combination treatment groups (1 and 2) on cognition (ADAS-Cog and MMSE) in comparison with the medication group (group 3). For group 1 these effects persisted up to the follow-up after 24 weeks. After 24 weeks group 2 scored better than group 3 only on the MMSE. This proves that cognitive stimulation in combination with traditional activation in day treatment and anti-Alzheimer’s disease medication is more effective that medication alone, and enhances the effects of traditional activating day treatment.

Cognitive stimulation therapy in a group setting

CST is a brief group therapy for people with mild-to-moderate dementia, based on the theoretical concepts of reality orientation training and cognitive stimulation. CST combines the elements of both methods that are proven to be effective [39,63]. CST is different from cognitive rehabilitation in that it is a more global approach that focuses on cognitive functioning (attention/concentration, orientation, different types of memory, visual constructive abilities, executive functions and verbal fluency), as well as on psychosocial functioning (self-confidence, motivation, socialization and affective condition) [58]. Furthermore, it is generally carried out in a group (or together with the informal carer) and the activities do not consist primarily of practicing situations/activities that require specific cognitive skills, as is the case in cognitive rehabilitation, or training cognitive functions as in cognitive training [39,63].

The therapy as developed in the UK by Spector [63] consists of 14 sessions lasting 45 min over a period of 7 weeks, in which activities are carried out based on particular themes, for example: childhood, current affairs, nutrition, numbers and word games, quiz, word association/conversation, sound, being creative, physical games, orientation, categorizing objects, using money and familiar faces. The activities are offered in a stimulating, pleasant and flexible way that is compatible with the needs and abilities of the group, by a person who is trained in the CST method. They follow an established pattern (introduction/goodbye, warming up and cooling down activities and a familiar activity, such as a song; the main activity is different each week) [64]. Different media and sensory stimuli are used to enhance communication and stimulate thought processes. For example, for the childhood theme, candy, songs and games are used.

This CST program was studied in an RCT for its effect on cognition, and it turned out to have positive effects on cognition that were comparable to cholinesterase inhibitors in people with Alzheimer’s disease. The improved cognition also increased the quality of life of the people who received CST [65]. Finally, economic analysis revealed that CST was also cost effective [66]. For this reason the NICE guidelines have recommended this therapy in the UK since 2006 for people with mild-to-moderate dementia [5].

A maintenance version of the English CST program (Maintenance CST; MCST) was recently studied in a controlled pilot, in which CST, after first being offered twice a week for a period of 7 weeks, was continued for another 16 weeks at a frequency of one session per week [67]. MCST was proven to result in a significant improvement on the MMSE. In the context of the Support at Home: Interventions to Enhance Life in Dementia research program (SHEILD) a large-scale RCT is presently being conducted in the UK among 230 people with dementia (Alzheimer’s disease and other types of dementia) into the effect of this maintenance therapy that – after 7 weeks of CST (two sessions/week) – offers MCST (one session/week) over a period of 24 weeks [68].

French research into a comparable 7-week cognitive stimulation program showed that after the program the participants
performed better on a memory test where they had to reproduce a shopping list and remember where objects were located inside a house [69]. An RCT conducted by Breuil et al. into CST also found effects on memory (episodic memory and remembering a list of words), as well as on orientation in space and time [70]. Finally, research by Vidal et al. found significant improvement on the MMSE (two points) after CST and a trend of fewer problems in everyday functioning [71].

Italian research revealed that global cognitive stimulation through recreational activities had more effect on behavior problems and skills in daily activities, than specific cognitive training of the procedural memory for activities of daily living and cognitive rehabilitation of residual functions [72]. Furthermore, at the 6-month follow-up the informal carers of the global stimulation group experienced less stress.

**Memory groups for people with early dementia**

Memory groups aim to help people with early dementia (MMSE score >22 of 30) with their memory problems by teaching them different strategies and techniques (generally based on the principles of cognitive rehabilitation), so that they can continue to lead the life they are accustomed to [73]. For example, by using aids, such as calendars, a timer, a dictaphone and basic techniques to remember and retrieve memories in different situations. The expectation is that once the individual has learned these techniques, he/she will also apply them in other situations. Memory groups are suitable for people who realize that they have memory problems, are motivated to do something about it and are able to communicate in a group setting. It proves to be advantageous if the informal carer supports the individual’s participation [73].

The use of memory groups is widespread, for example, in memory clinics, rehabilitation centers, regional mental health services and Alzheimer’s disease foundations. Burnham describes the general procedure in a memory group: the participants are asked to work out which skills they most want to retain and are subsequently encouraged to train these skills [73]. The core techniques taught in the different situations are: repetition, retrieving memories regularly, association with something or someone the individual already knows, use of rhyme, alliteration, use of aids and utilizing habits. In addition, the participants are encouraged to find out what kind of information (e.g., text, pictures or sound) work best to help them remember and retrieve things from their memory. The teaching material is drafted in simple language with many explanatory illustrations and the participants are encouraged to discuss it with a relative or friend. The memory group meets 6- to 12-times, depending on the participants’ needs, and is preferably led by two persons (e.g., psychologist, occupational therapist or social psychiatric nurse). Before participation and after the group each participant is visited at home to see how the learned techniques can be applied in the home situation and what the family or the informal care can do to assist.

Case studies show that these memory groups have a positive effect on cognitive (process) skills and the effective use of aids in daily life, resulting in more independent functioning [73]. Various scientific studies also demonstrate that memory groups can be successful in early dementia: the individual learns to use aids and strategies, cognitive functioning, as measured with the MMSE, stabilizes to some degree and mood can improve [74,75]. Research by Lipinska et al. has shown that self-generated instructions/associations (‘cues’) are more effective for remembering and retrieving memories than instructions designed by others (healthcare professionals/informal carers) [76]. This is an argument in favor of the method described above, which is tailored to the individual.

**Movement programs & psychomotor therapy**

Movement programs for people with dementia are applied from different therapeutic perspectives: cognitive and neurophysiological, holistic, behavior therapeutic and psychodynamic/interactional [77]. The programs based on a cognitive and neurophysiological perspective generally utilize movement activities from physical training, fitness training, sports and games. Regular physical exercise aims to stimulate the individual as an information-processing system and to positively influence the neurophysiological or pathophysiological processes underlying the (disturbed) system [78]. The ‘use it or lose it’ theory fits well in this perspective.

The programs from a holistic perspective are aimed at the recovery of the bio–psycho–socio system and, in addition to movement exercises to stimulate self-expression, self-image and self-esteem, also utilize music, breathing exercises, informal conversation and nutritional education as therapeutic tools [77].

The behavior therapeutic programs are based on principles from learning theory (learning through the positive consequences of particular behaviors). They utilize verbal rewards and games with an intrinsic reward (e.g., ninepins and goal kicking) in order to (re)activate and adjust behavioral problems [77].

Psychodynamically (interactional) oriented movement therapy programs start from the assumption that behavior and mood disorders in dementia are partly caused by psychological reactions of people with dementia to their cognitive disorders and the changed relationship with the environment. They offer movement activities in which the participants can experience some degree of success and confidence in themselves and others again [77]. In this way they learn to cope with their own disabilities, an appeal is made on them to (re)engage with their environment and the emotional balance is restored. Depending on the stage of the dementia, extra attention is given to coping with cognitive impairments and emotional support (mild dementia), social contact and safety (moderate dementia), and sensory experiences and contact (severe dementia).

A 2004 systematic review and meta-analysis of randomized clinical trials of the effect of movement on people with dementia and related cognitive disorders (n = 2020) shows that regular physical exercise, such as walking, chair exercises, dancing, weight training and riding on a bicycle ergometer, apart from affecting the level of fitness (cardiovascular and BMI), physical functions (strength and flexibility), daily functioning and positive behavior, also has a positive effect on cognitive functions, such as attention,
executive functions and language [25,79]. The effects on health-related physical fitness are medium to large (d > 0.5 to d > 0.8; [80]), and are generally medium (d = 0.5) for cognitive, functional and behavior outcomes. Later studies also show the effect of movement on cognition. A study (RCT) carried out in Belgium showed a significant improvement on cognition (three points or more on MMSE) in people with dementia who participated in moving to music for 30 min every day for a period of 3 months, whereas no change was observed in the control group [81]. A very recent RCT conducted in the UK [82] shows that after only 6 weeks of participation in (anaerobic) movement activities elderly people with Alzheimer’s disease improved on attention, visual memory and working memory as compared with a control group that had deteriorated on these aspects.

Several (nonrandomized) controlled studies (including [83,84]) also showed that simple (anaerobic) movement activities have a (brief) positive influence on the general cognitive functioning of elderly people with dementia, more specifically on: immediate memory, recognition, word fluency and logical memory.

Movement activation, such as psychodynamically-oriented psychomotor group therapy was examined in an RCT among elderly people with mild-to-moderately severe dementia of the Alzheimer type (n = 40) in nursing homes [11,18,77]. The experimental group received psychomotor therapy (for 7 months, three-times a week for 45 min), while a control group was offered activity therapy in the same period and with the same frequency. In comparison with activity therapy, psychomotor group therapy had a more positive effect on the satisfaction of the participants, aggression and night-time restlessness. The latter two (aggression and night-time restlessness) stabilized in the therapy group, whereas they increased in the control group (also see [85,86]).

During the therapy sessions, however, statistically significant improvements were also found on memory, liveliness and initiative. The same movement activation program as the one investigated by Dróes was studied in an RCT among people with cognitive disorders on psychogeriatric wards in homes for the elderly by Hopman-Rock et al. [87]. They found positive effects on cognition and social behavior.

**Reminiscence**

In reminiscence activities, events and experiences from the past are discussed in one-on-one or group conversations [88]. Aids are often used, such as videos, photographs, newspaper clipping books, scrapbooks and life story books. The objective of reminiscence is to offer a pleasant activity and a tool to maintain communication with others [89,90]. In addition, reminiscing together can also provide recognition and emotional support (also to the informal carer) in coping with the changes or losses that individuals go through as a result of the dementia. The method is useful especially for elderly people in the early stages of dementia, when, despite the short-term memory problems, they can still access memories from the past relatively easily.

Although reminiscence is a very popular method and is used widely for people with dementia [91], its effectiveness in dementia has not been studied extensively, and generally only in small, uncontrolled studies. Woods et al. indicate in their systematic review that only four small randomized controlled trials, of relatively poor quality, on the effect of reminiscence (group) therapy have been conducted on people with dementia [88]. Four to six weeks after the treatment they show a significant improvement in cognition and mood and a reduction of stress in the informal carers who participated in the groups. The informal carers also indicated that the persons with dementia functioned better at home. The results of more recent RCTs do not provide unambiguous results. One Taiwanese study (RCT) of reminiscence groups (1 h/week for 8 weeks) among 102 individuals with dementia showed significant improvements on the MMSE and the Cornell Scale for Depression [92]. However, a smaller RCT study of reminiscence groups (1 h/week for 3 months) among people with vascular dementia (n = 60) in Japan found no significant effect on cognitive functioning or mood [93].

Other (un)controlled studies of reminiscence in a group setting show positive effects on the cognitive, social and emotional domain [18,19]; for example: general cognitive functioning, improvement of interest, interaction and social behavior and fewer behavior problems (including agitation, aggression and unrest). Positive effects were also described on feelings of self-esteem, acceptance of past and present, and expectations for the future of people with dementia.

Studies of individual reminiscence among elderly people with dementia show positive effects on social behavior, aggression [89], sense of identity and enjoyment [94]. Persons with severe cognitive impairments have shown increased involvement in their environment [90].

In the UK, a large multicenter RCT (RemCare) is being conducted into the effect and cost–effectiveness of reminiscence groups for people with dementia and their informal carers (3 months of weekly meetings, 7 months of monthly meetings) [95]. Two hundred dyads that participate in the reminiscence groups are compared with 200 dyads that receive usual care. The primary outcome measure is quality of life, the secondary outcome measures are: autobiographical memories; quality of relationship between people with dementia and informal carers; and the degree of depression and experienced anxiety of people with dementia and their informal carers.

**Conclusion**

This article has addressed how people with dementia experience and cope with their cognitive disorders, and discussed several psychosocial treatment methods that are applied to help people with dementia cope with their cognitive limitations in daily life, maintain an emotional balance and maintain social contact with other people in their environment. So far, evidence for the effect of the described methods on memory and other cognitive functions is limited, because often the applied research methods were weak and the actual implementation (and characteristics) of the interventions differed, which makes it difficult to draw firm conclusions regarding the effectiveness of these interventions. However, the described interventions are promising, with the best evidence found for individually tailored cognitive
rehabilitation, CST in a group setting and movement programs. The effects are medium and comparable to (and sometimes even larger than) the effects on cognition of anti-Alzheimer’s disease medication. An added advantage is that they do not have the side effects that these drugs may have. Several recent studies indicate that a combined treatment of cognitive stimulation and acetylcholinesterase inhibitors results in better effects than medication alone. Further research is recommended.

Other methods that may also have a positive effect on cognitive functioning, or may slow down cognitive decline, such as activating day treatment programs, activity groups, validation therapy, normalization of the living environment, small-scale living facilities, light therapy and supportive technology, were not discussed here. The relevant research, if conducted, generally shows that as yet, there is insufficient evidence to draw conclusions about the effectiveness of these methods on cognition [31,36,96,97]. Again, more scientific research is advisable.

**Expert commentary**

Since the 1960s psychosocial treatment methods have been used to support people with dementia and their relatives in coping with the consequences of dementia, including cognitive problems. Also, for many years research has been looking into the effects of different psychosocial treatment methods on cognition, behavior and mood problems, quality of life and delayed nursing home admission of people with dementia and on experienced burden, physical and mental health and quality of life of their informal carers. In this article we described the found effects on memory and other cognitive functions, such as attention, orientation, interest, sense of identity and daily functioning, of cognitive rehabilitation, CST, memory groups, movement programs and psychomotor therapy, and reminiscence.

Studies in the past have varied in quality, and points of criticism include small research populations, mediocre research designs, incomplete descriptions of interventions and a lack of a theoretical framework for the interventions [35,98]. Although more thorough and larger-scale RCTs have been conducted in the past decade [99], results still do not allow firm conclusions regarding the effectiveness of the described interventions. The analysis of research results presented here warrants the conclusion that most evidence for the effectiveness on cognitive functioning has been found for movement programs and to a lesser extent for cognitive rehabilitation and cognitive stimulation in a group setting. What is the significance of these findings for everyday practice? When treatment is considered for a cognitively impaired person with dementia, a psychosocial treatment is preferred for example, CST was included in the NICE guidelines in the UK. At the European level there are also some good initiatives. In the European network of researchers on Early and Timely Interventions in Dementia (INTERDEM), for example, forces are joined to stimulate the development, evaluation and implementation of evidence-based psychosocial treatment methods [99]. Because their effectiveness has been insufficiently or not yet demonstrated, further research is advisable for some of the psychosocial treatment methods described here, before implementing them on a large scale. Furthermore, it is necessary to obtain consensus regarding the outcome measures that are used [100]. Obviously, they need to have good psychometric properties, but they should also be attuned to the effects in daily life that the intervention focuses on. In this respect, the commonly used MMSE, for example, can be brought up for discussion. First, this instrument is a diagnostic screening instrument and not intended for measuring treatment effects. Second, if this instrument showed treatment effects it is not clear whether several points of change on the MMSE have a clinically relevant impact on the daily life of persons with dementia. It would be worthwhile to know whether memory improvement has a generalizing effect on other domains of daily life, such as engaging in more social contacts, improved self-esteem or autonomy, giving meaning to one’s life or better quality of life as a whole. This would be very relevant for clinical practice and ultimately for the person with dementia himself.

Related to this issue is how ‘evidence-based treatment methods’ may be successfully implemented in personalized dementia care, because positive research results do not guarantee effectiveness in clinical practice, where people will want to know whether an intervention will be effective for an individual client and what is the best way to offer the intervention (by whom, how and what frequency). The different studies do not always provide clear answers on this and so there is a challenge for researchers to investigate more extensively what specific treatment methods are effective for which (sub)groups in which circumstances [37]. Today there is consensus that, regardless of the intervention chosen, the starting point must be that it is attuned to the specific wishes, preferences, abilities and needs of the person with dementia. Positive research results and inclusion of the treatment methods into guidelines are important preconditions for a wide implementation of psychosocial treatment methods in practice, but this is not sufficient. It takes more to successfully implement interventions in actual practice. It requires support in different echelons of an organization (management level and executive level), staff need to be trained and adequate financial resources are necessary to carry out the interventions. The current financial and political climate in The Netherlands and other European countries is not very favorable in this respect, and we will have to pull out all the stops to guarantee continued best possible care for people with dementia in the future.

**Five-year view**

Although in previous decades there has been much research to help people with dementia cope with their cognitive impairments,
compared with cancer and cardiovascular disease research grants for dementia research lag behind. The budget for dementia research is less than 5% of the cancer research budget [101]. This is out of proportion to the social costs of dementia care: in high-income countries these far outweigh the social costs of other chronic diseases [102]. Furthermore, the number of people with dementia is expected to double approximately every 20 years, up to 115.4 million in 2050 worldwide [102]. It is therefore necessary to free up more funds for dementia-related research. The large majority of dementia studies involve fundamental research, aimed at early diagnosis, functioning of memory and medication. However, many nonpharmacological treatment methods, for example, psychosocial or psychological treatment methods, have been proven to be at least as effective as pharmacological therapies [35], and the absence of side effects warrants more attention for nonpharmacological treatment methods in research. This is also recommended in the recently published European Dementia Research Agenda [201].

The positive effects on cognition of cognitive rehabilitation, cognitive stimulation and memory groups for people with dementia have as yet not been generally confirmed in large-scale RCTs, and the studies have frequently been conducted in homogeneous populations only. To examine whether the results of these interventions also apply to subgroups, high-quality RCTs are required in the future, preferably in an international context. In addition to the effectiveness of interventions, we also recommend cost–effectiveness studies in order to facilitate the implementation of effective interventions. At present there are three large-scale RCTs that also focus on cost–effectiveness: SHIELD (Maintenance Cognitive Stimulation Therapy [68]), RemCare (reminiscence groups [95]) and WHEDA (occupational therapy [103]). The results of these studies are important for the future of dementia treatment methods, and the results are eagerly anticipated.

The research agenda for dementia-related research for the next 5 years has some important focal points. First of all international, national and local authorities, healthcare insurers and companies must reserve more budget to be able to increase dementia research. It is up to the dementia experts to raise awareness among authorities and policy-makers regarding the significant increase of people with dementia in the near future and the enormous additional social costs. Second, to make the (financial) added value of treatment methods visible, future research must also focus on cost–effectiveness. Third, future research should focus not only on early diagnosis, but also on psychosocial and psychological therapies, to preserve cognitive functions for a longer period of time. Memory performance is an important outcome measure, because it greatly impacts everyday life, but further research into how psychosocial therapies may benefit other cognitive domains that also affect the quality of life of people with dementia, such as attention, interest, sense of identity, praxis and language, is needed as well. In addition to attention for promising treatment methods, such as cognitive rehabilitation, movement programs and combined interventions, the effects on cognition of the interventions that have not been thoroughly investigated yet must be explored further, for example, memory groups, activating day treatment and validation therapy. It is important to use high-quality study designs, with multiple settings and international collaboration to enable subgroup research. Finally, attention should be given to new innovative methods, such as the use of assistive technology. Information communication technology has great potential because of the possibility of personalizing individual interventions, the application in home situations and intramural settings and reducing the burden on professional and informal carers. Examples of such projects are ROSETTA [202] and Computerized Personal Interventions for Alzheimer’s Patients, which uses computerized systems for reminiscence therapy and cognitive training [203].

The further development of early and timely treatment methods remains necessary to be able to offer efficient care to people with dementia, now and in the future.

Key issues

- There is much diversity in how people with dementia experience dementia, including memory problems.
- People with dementia face several adaptive tasks comparable to those experienced in chronic disease in general, such as coping with one’s own disabilities, preserving an emotional balance and coping with an uncertain future.
- People with dementia use a variety of coping strategies, such as denial, overcompensation, downplaying, regression, avoiding problems and social contact, and humor, to deal with the consequences of dementia in daily life.
- In the last three decades, several drugs have been developed that can improve, or stabilize, the cognitive and daily functioning of people with Alzheimer’s disease. Examples are the acetylcholinesterase inhibitors rivastigmine, donepezil and galantamine, and the NMDA antagonist memantine.
- Several nonpharmacological psychosocial treatments, such as cognitive rehabilitation, cognitive training, cognitive stimulation therapy, memory groups, movement activation and reminiscence, aim to improve the cognitive functioning of people with dementia, including memory.
- The evidence for the effect of psychosocial treatments on cognition is still limited. Most evidence exists for movement activation, cognitive rehabilitation attuned to individual needs, and cognitive stimulation therapy in groups.
- The effects of psychosocial treatments are comparable with, or better than, the effects of available anti-Alzheimer’s disease drugs.
- Some studies show a surplus value of combination therapy, combining psychosocial treatment with anti-Alzheimer’s disease medication.
Dröes, van der Roest, van Mierlo & Meiland

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Papers of special note have been highlighted as:
- of interest
- of considerable interest


8 Clare L. We’ll fight it as long as we can: managing threats to self. In: *Managing threats to self: perspectives; an overview of the literature.* RM, Riphagen II, Jonker C, Eefsting JA. (2002). Papers of special note have been highlighted as:

- of interest
- of considerable interest


16 De Lange J. Dealing with dementia. Effects of Integrated Emotion-Oriented Care on Adaptation and Coping of People with Dementia in Nursing Homes; A Qualitative Study as Part of a Randomized Clinical Trial. PhD-Thesis. Erasmus University, Rotterdam, The Netherlands (2004).


• Provides the results of a meta-analysis that was conducted on the data of 30 trials, demonstrating that exercise training increases fitness, physical function, cognitive function and positive behavior in people with dementia and related cognitive impairments.


 reviews of the effects of nonpharmacological therapies in AD and related disorders.

provides a unique overview of the characteristics of people with dementia that are related to effective outcomes of psychosocial interventions on different domains of functioning, including the cognitive domain. The results may help to improve personalized dementia care.

Can reality orientation be rehabilitated? Development and piloting of an evidence-based programme of cognition-based therapies for people with dementia.


66 Based on 17 controlled studies, this systematic review provides an overview of the effects of cognitive training on learning, memory, executive functioning, activities of daily living, general cognitive problems, depression and self-rated general functioning in people with AD.

67 Magi-Kale CC, Fellows RP, Said PG et al. Use of computer assisted and interactive cognitive training programmes with


Forbes D, Culum I, Lischka AR et al. Light therapy for managing cognitive, sleep,


This manifesto of the INTERDEM group (a European network of researchers investigating early and timely psychosocial interventions in dementia), pleads for the development, evaluation and implementation of theory- and evidence-based psychosocial treatment methods in dementia care.


• Provides a clear comprehensive global picture of the economic impact of AD and other dementias and contains important policy recommendations. In 2011, a new World Alzheimer Report on the benefits of early diagnosis and early interventions was published.


Websites


Memory problems in dementia: adaptation and coping strategies and psychosocial treatments

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### Activity Evaluation

**Where 1 is strongly disagree and 5 is strongly agree**

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<td>1. The activity supported the learning objectives.</td>
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<td>2. The material was organized clearly for learning to occur.</td>
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<td>3. The content learned from this activity will impact my practice.</td>
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<td>4. The activity was presented objectively and free of commercial bias.</td>
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1. Your patient is a 73-year-old woman with early Alzheimer disease. Based on the review by Prof. Dröes and colleagues, which of the following statements about memory problems in people with dementia, their impact on everyday life, and coping strategies is **most likely** correct?

- **A** In early stages, language impairment is likely to be more prominent than memory problems
- **B** The vast majority of people with dementia experience memory problems and other dementia-related problems in the same way
- **C** People with dementia do not face adaptive tasks experienced in chronic disease in general
- **D** Coping strategies used by people with dementia may include denial, overcompensation, downplaying, regression, avoiding problems and social contact, and humor

2. You are considering psychosocial treatments for the patient described in question 1. Based on the review by Prof. Dröes and colleagues, which of the following statements about these treatments is **most likely** correct?

- **A** Psychosocial treatments are significantly less effective than currently available anti-Alzheimer drugs
- **B** Cognitive rehabilitation builds on the memory skills a person still has and uses compensatory aids when memory fails
- **C** Psychosocial treatments have been clearly proven to improve cognition
- **D** There is no evidence to support use of movement activation therapy

3. You are considering pharmacotherapy for the patient described in question 1. Based on the review by Prof. Dröes and colleagues, which of the following statements about available drugs is **most likely** correct?

- **A** No available pharmacotherapy can stabilize progression of cognitive decline, even for a short while
- **B** Rivastigmine is an NMDA-antagonist
- **C** Donepezil has more side effects than rivastigmine tablets
- **D** Psychosocial treatment may offer an additional benefit to patients taking anti-Alzheimer medication